



International Civil Aviation Organization

INFORMATION PAPER

TWENTIETH MEETING OF THE METEOROLOGY SUB-GROUP (MET SG/20) OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG)

Bangkok, Thailand, 6 – 9 June 2016

Agenda Item 4: Planning and monitoring

REVIEW AMENDMENT 77 TO ANNEX 3

(Presented by the Secretariat)

SUMMARY

Amendment 77 to Annex 3 becomes effective on 11 July 2016 and applicable on 10 November 2016. The amendment introduces provisions for digital format for volcanic ash and tropical cyclone advisories, AIRMET information, METAR/SPECI, TAF and SIGMET information as a recommended practice, along with other iterative improvements. States are required to inform ICAO of any disapproval before 11 July 2016 and file any differences before 10 October 2016.

1. INTRODUCTION

1.1 The first edition of Annex 3 to the Convention on International Civil Aviation (Meteorological Service for International Air Navigation) was adopted by the Council of ICAO in 1948, with the principle intent of defining the meteorological codes to be used by States for the transmission of meteorological information for aeronautical purposes to users.

1.2 Since this first edition, Annex 3 has undergone iterative improvement when necessary to ensure that aeronautical meteorological services continue to fulfil the evolving operational requirements as expressed by States and users, with due regard to evolving scientific capabilities and technological advances.

1.3 Amendment 77 to Annex 3 was adopted by the ICAO Council on 22 February 2016. The amendment will become effective on 11 July 2016 and applicable on 10 November 2016. This paper presents the adoption of Amendment 77 to Annex 3 for the information of the meeting.

2. DISCUSSION

2.1 The adoption of Amendment 77 to Annex 3 was circulated to States and international organizations concerned in ICAO letter Ref.: AN 10/1.1-16/17, dated 31 March 2016. A copy of the letter is provided at the **Attachment** to this paper, providing full details of the amendment and its history.

2.2 Amendment 77 to Annex 3 includes the following improvements:

- Introduction of digital format for volcanic ash and tropical cyclone advisories and AIRMET information and the provision of METAR/SPECI, TAF and SIGMET information in digital format as a recommended practice;
- Introduction of WAFS forecast information on cumulonimbus clouds, icing and turbulence and additional flight levels for WAFS gridded forecast information;
- Removal of reference to legacy satellite distribution systems in lieu of Internet-based services;
- Modification of GAMET forecast requirements and clarification to RVR assessment requirements;
- Other minor modifications and editorial alignments; and
- An amendment concerning the use of a global reporting format for assessing and reporting runway surface conditions.

2.3 The ICAO letter notifying adoption of Amendment 77 to Annex 3 requested that States do the following:

- Before 11 July 2016, inform ICAO of any disapproval to the amendment; and
- Before 10 October 2016, inform ICAO using the Electronic Filing of Differences (EFOD) System of:
 - Any differences that will exist on 10 November 2016 between the national regulations or practices and the provisions of the whole of Annex 3*, and thereafter of any further differences that may arise; and
 - The date or dates by which the State will have complied with the provisions of the whole of Annex 3*.

**Inclusive of all amendments up to and including Amendment 77.*

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information in this paper.



International
Civil Aviation
Organization

Organisation
de l'aviation civile
internationale

Organización
de Aviación Civil
Internacional

Международная
организация
гражданской
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航空组织

Tel.: +1 514-954-8219 ext. 6717

Ref.: AN 10/1.1-16/17

31 March 2016

Subject: Adoption of Amendment 77 to Annex 3

Action required: a) Notify any disapproval before 11 July 2016; b) Notify any differences and compliance before 10 October 2016 and 5 October 2020; c) Consider the use of the Electronic Filing of Differences (EFOD) System for notification of differences and compliance

Sir/Madam,

1. I have the honour to inform you that Amendment 77 to the *International Standards and Recommended Practices, Meteorological Service for International Air Navigation* (Annex 3 to the Convention on International Civil Aviation) was adopted by the Council at the fourth meeting of its 207th Session on 22 February 2016. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (<http://portal.icao.int>) where you can access all other relevant documentation.

2. When adopting the amendment, the Council prescribed 11 July 2016 as the date on which it will become effective, except for any part concerning which a majority of Contracting States have registered their disapproval before that date. In addition, the Council resolved that Amendment 77, to the extent it becomes effective, will become applicable on 10 November 2016¹.

3. Amendment 77 arises from:

- a) Recommendation 5/1 of the Meteorology (MET) Divisional Meeting (2014); and
- b) a proposal on the use of a global reporting format for assessing and reporting runway surface conditions from the Friction Task Force (FTF) of the Aerodrome Design and Operations Panel (ADOP).

¹ 5 November 2020 for Amendment 77-B

4. The amendment concerning aeronautical meteorology introduces a further incremental addition to the digital exchange of meteorological information as a component of the system-wide information management (SWIM) environment by incorporating volcanic ash and tropical cyclone advisories as well as AIRMET information. Additional world area forecast system (WAFS) information on cumulonimbus clouds, icing and turbulence is introduced as well as reference to Internet-based services in lieu of the removal of reference to legacy satellite distribution systems. These updates provide for enhanced efficiencies and improved information on hazardous meteorological conditions.

5. The amendment concerning enhanced global reporting format for assessing and reporting runway surface conditions is designed to report runway surface conditions in a standardized manner such that flight crew are able to accurately determine aeroplane take-off and landing performance, resulting in a global reduction in runway excursion incidents/accidents. The proposal provides a solution to a long outstanding issue of relating aeroplane performance to runway state information in a more objective way. The amendment is part of a major revision to several Annexes.

6. The subjects are given in the amendment to the Foreword of Annex 3, a copy of which is in Attachment A.

7. In conformity with the Resolution of Adoption, may I request:

- a) that before 11 July 2016 you inform me if there is any part of the adopted Standards and Recommended Practices (SARPs) amendments in Amendment 77 (i.e., Amendments 77-A and 77-B) concerning which your Government wishes to register disapproval, using the form in Attachment B for this purpose. Please note that only statements of disapproval need be registered and if you do not reply it will be assumed that you do not disapprove of the amendment;
- b) that before 10 October 2016² you inform me of the following, using the Electronic Filing of Differences (EFOD) System or the form in Attachment C for this purpose:
 - 1) any differences that will exist on 10 November 2016³ between the national regulations or practices of your Government and the provisions of the whole of Annex 3, as amended by all amendments up to and including Amendment 77, and thereafter of any further differences that may arise; and
 - 2) the date or dates by which your Government will have complied with the provisions of the whole of Annex 3, as amended by all amendments up to and including Amendment 77.

8. With reference to the request in paragraph 7 a) above, it should be noted that a registration of disapproval of Amendment 77 or any part of it in accordance with Article 90 of the Convention does not constitute a notification of differences under Article 38 of the Convention. To comply with the latter provision, a separate statement is necessary if any differences do exist, as requested in paragraph 7 b) 1). It is recalled in this respect that international Standards in Annexes have a conditional binding force, to the extent that the State or States concerned have not notified any difference thereto under Article 38 of the Convention.

² 5 October 2020 for Amendment 77-B

³ 5 November 2020 for Amendment 77-B

9. With reference to the request in paragraph 7 b) above, it should be also noted that the ICAO Assembly, at its 38th Session (24 September to 4 October 2013), resolved that Member States should be encouraged to use the EFOD System when notifying differences (Resolution A38-11, refers). The EFOD System is currently available on the Universal Safety Oversight Audit Programme (USOAP) restricted website (<http://www.icao.int/usoap>) which is accessible by all Member States. You are invited to consider using this for notification of compliance and differences.

10. Guidance on the determination and reporting of differences is given in the Note on the Notification of Differences in Attachment D. Please note that a detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.

11. I would appreciate it if you would also send a copy of your notifications, referred to in paragraph 7 b) above, to the ICAO Regional Office accredited to your Government.

12. At the fifth meeting of its 204th Session, the Council requested that States, when being advised of the adoption of an Annex amendment, be provided with information on implementation and available guidance material, as well as an impact assessment. This is presented for your information in Attachments E and F, respectively.

13. As soon as practicable after the amendment becomes effective, on 11 July 2016, replacement pages incorporating Amendment 77 (i.e., Amendments 77-A and 77-B) will be forwarded to you.

14. Please note that Amendment 77-B concerning the use of a global reporting format for assessing and reporting runway surface conditions has an applicability date of 5 November 2020. It should be noted that the time between the effective date and the applicability date is longer than usual due to the nature and complexity of the proposal.

Accept, Sir/Madam, the assurances of my highest consideration.


Fang Liu
Secretary General

Enclosures:

- A — Amendment to the Foreword of Annex 3
- B — Form on notification of disapproval of all or part of Amendment 77 to Annex 3
- C — Form on notification of compliance with or differences from Annex 3, Amendment 77
- D — Note on the Notification of Differences
- E — Implementation task list and outline of guidance material in relation to Amendment 77 to Annex 3
- F — Impact assessment in relation to Amendment 77 to Annex 3

ATTACHMENT A to State letter AN 10/1.1-16/17

AMENDMENT TO THE FOREWORD OF ANNEX 3

Add the following at the end of Table A:

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Adopted/Approved Effective Applicable</i>
77-A	Meteorology (MET) Divisional Meeting (2014)	Introduction of digital format for volcanic ash and tropical cyclone advisories and AIRMET information and the provision of METAR/SPECI, TAF and SIGMET information in digital format as a recommended practice. Introduction of WAFS forecast information on cumulonimbus clouds, icing and turbulence and additional flight levels for WAFS gridded forecast information. Removal of reference to legacy satellite distribution systems in lieu of Internet-based services. Modification of GAMET forecast requirements and clarification to RVR assessment requirements. Other minor modifications and editorial alignments are incorporated.	22 February 2016 11 July 2016 10 November 2016

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Adopted/Approved Effective Applicable</i>
77-B	Friction Task Force (FTF) of the Aerodrome Design and Operations Panel (ADOP)	Amendment concerning the use of a global reporting format for assessing and reporting runway surface conditions	22 February 2016 11 July 2016 5 November 2020

ATTACHMENT B to State letter AN 10/1.1-16/17

**NOTIFICATION OF DISAPPROVAL OF ALL OR PART OF
AMENDMENT 77 TO ANNEX 3**

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montreal, Quebec
Canada H3C 5H7

(State) _____ hereby wishes to disapprove the following parts of
Amendment 77 to Annex 3:

Signature _____

Date _____

NOTES

- 1) If you wish to disapprove all or part of Amendment 77 to Annex 3, please dispatch this notification of disapproval to reach ICAO Headquarters by 11 July 2016. If it has not been received by that date it will be assumed that you do not disapprove of the amendment. **If you approve of all parts of Amendment 77, it is not necessary to return this notification of disapproval.**
- 2) This notification should not be considered a notification of compliance with or differences from Annex 3. Separate notifications on this are necessary. (See Attachment C.)
- 3) Please use extra sheets as required.

ATTACHMENT C to State letter AN 10/1.1-16/17

NOTIFICATION OF COMPLIANCE WITH OR DIFFERENCES FROM ANNEX 3

(including all amendments up to and including Amendment 77)

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montreal, Quebec
Canada H3C 5H7

1. No differences will exist on _____ between the national regulations and/or practices of **(State)** _____ and the provisions of Annex 3, including all amendments up to and including Amendment 77.

2. The following differences will exist on _____ between the regulations and/or practices of **(State)** _____ and the provisions of Annex 3, including Amendment 77 (Please see Note 2) below.)

a) Annex Provision (Please give exact paragraph reference)	b) Details of Difference (Please describe the difference clearly and concisely)	c) Remarks (Please indicate reasons for the difference)
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(Please use extra sheets as required)

3. By the dates indicated below, **(State)** _____ will have complied with the provisions of Annex 3, including all amendments up to and including Amendment 77 for which differences have been notified in 2 above.

a) Annex Provision (Please give exact paragraph reference)	b) Date	c) Comments
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(Please use extra sheets as required)

Signature _____

Date _____

NOTES

- 1) If paragraph 1 above is applicable to your State, please complete paragraph 1 and return this form to ICAO Headquarters. If paragraph 2 is applicable to you, please complete paragraphs 2 and 3 and return the form to ICAO Headquarters.
- 2) A detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.
- 3) Guidance on the notification of differences is provided in the Note on the Notification of Differences and in the *Manual on Notification and Publication of Differences* (Doc 10055).
- 4) Please send a copy of this notification to the ICAO Regional Office accredited to your Government.

ATTACHMENT D to State letter AN 10/1.1-16/17

NOTE ON THE NOTIFICATION OF DIFFERENCES
(Prepared and issued in accordance with instructions of the Council)

1. *Introduction*

1.1 Article 38 of the *Convention on International Civil Aviation* (“Convention”) requires that a Contracting State notify ICAO any time it does not comply with a Standard in all respects, it does not bring its regulations or practices into full accord with any Standard, or it adopts regulations or practices differing in any particular respect from the Standard.

1.2 The Assembly and the Council, when reviewing the notification of differences by Contracting States in compliance with Article 38 of the Convention, have repeatedly noted that the timeliness and currency of such notifications is not entirely satisfactory. Therefore, this note is issued to reiterate the primary purpose of Article 38 of the Convention and to facilitate the determination and notification of differences.

1.3 The primary purpose of the notification of differences is to promote safety, regularity and efficiency in air navigation by ensuring that governmental and other agencies, including operators and service providers, concerned with international civil aviation are made aware of all national regulations and practices in so far as they differ from those prescribed in the Standards contained in Annexes to the Convention.

1.4 Contracting States are, therefore, requested to give particular attention to the notification of differences with respect to Standards in all Annexes, as described in paragraph 4 b) 1) of the Resolution of Adoption.

1.5 Although differences from Recommended Practices are not notifiable under Article 38 of the Convention, the Assembly has urged Contracting States to extend the above considerations to Recommended Practices contained in Annexes to the Convention, as well.

2. *Notification of differences from Standards and Recommended Practices (SARPs)*

2.1 Guidance to Contracting States in the notification of differences to Standards and Recommended Practices (SARPs) can only be given in very general terms. Contracting States are further reminded that compliance with SARPs generally extends beyond the issuance of national regulations and requires establishment of practical arrangements for implementation, such as the provision of facilities, personnel and equipment and effective enforcement mechanisms. Contracting States should take those elements into account when determining their compliance and differences. The following categories of differences are provided as a guide in determining whether a notifiable difference exists:

- a) *A Contracting State’s requirement is more exacting or exceeds a SARP (Category A)*. This category applies when the national regulation and practices are more demanding than the corresponding SARP, or impose an obligation within the scope of the Annex which is not covered by the SARP. This is of particular importance where a Contracting State requires a higher standard which affects the operation of aircraft of other Contracting States in and above its territory;

- b) *A Contracting State's requirement is different in character or the Contracting State has established other means of compliance (Category B)**. This category applies, in particular, when the national regulation and practices are different in character from the corresponding SARP, or when the national regulation and practices differ in principle, type or system from the corresponding SARP, without necessarily imposing an additional obligation; and
- c) *A Contracting State's requirement is less protective, partially implemented or not implemented (Category C)*. This category applies when the national regulation and practices are less protective than the corresponding SARP; when no national regulation has been promulgated to address the corresponding SARP, in whole or in part; or when the Contracting State has not brought its practices into full accord with the corresponding SARP.

These categories do not apply to Not Applicable SARP. Please see the paragraph below.

2.2 **Not Applicable SARP.** When a Contracting State deems a SARP concerning aircraft, operations, equipment, personnel, or air navigation facilities or services to be not applicable to the existing aviation activities of the State, notification of a difference is not required. For example, a Contracting State that is not a State of Design or Manufacture and that does not have any national regulations on the subject, would not be required to notify differences from Annex 8 provisions related to the design and construction of an aircraft.

2.3 **Differences from appendices, tables and figures.** The material comprising a SARP includes not only the SARP itself, but also the appendices, tables and figures associated with the SARP. Therefore, differences from appendices, tables and figures are notifiable under Article 38. In order to file a difference against an appendix, table or figure, States should file a difference against the SARP that makes reference to the appendix, table or figure.

2.4 **Differences from definitions.** Contracting States should notify differences from definitions. The definition of a term used in a SARP does not have independent status but is an essential part of each SARP in which the term is used. Therefore, a difference from the definition of the term may result in there being a difference from any SARP in which the term is used. To this end, Contracting States should take into consideration differences from definitions when determining compliance or differences to SARPs in which the terms are used.

2.5 The notification of differences should be not only to the latest amendment but to the whole Annex, including the amendment. In other words, Contracting States that have already notified differences are requested to provide regular updates of the differences previously notified until the difference no longer exists.

2.6 Further guidance on the identification and notification of differences, examples of well-defined differences and examples of model processes and procedures for management of the notification of differences can be found in the *Manual on Notification and Publication of Differences* (Doc 10055).

* The expression "different in character or other means of compliance" in b) would be applied to a national regulation and practice which achieve, by other means, the same objective as that of the corresponding SARPs or for other substantive reasons so cannot be classified under a) or c).

3. *Form of notification of differences*

3.1 Differences can be notified:

- a) by sending to ICAO Headquarters a form on notification of compliance or differences; or
- b) through the Electronic Filing of Differences (EFOD) System at www.icao.int/usoap.

3.2 When notifying differences, the following information should be provided:

- a) the number of the paragraph or subparagraph which contains the SARP to which the difference relates*;
- b) the reasons why the State does not comply with the SARP, or considers it necessary to adopt different regulations or practices;
- c) a clear and concise description of the difference; and
- d) intentions for future compliance and any date by which your Government plans to confirm compliance with and remove its difference from the SARP for which the difference has been notified.

3.3 The differences notified will be made available to other Contracting States, normally in the terms used by the Contracting State when making the notification. In the interest of making the information as useful as possible, Contracting States are requested to ensure that:

- a) statements be as clear and concise as possible and be confined to essential points;
- b) the provision of extracts from national regulations not be considered as sufficient to satisfy the obligation to notify differences; and
- c) general comments, unclear acronyms and references be avoided.

* This applies only when the notification is made under 3.1 a).

ATTACHMENT E to State letter AN 10/1.1-16/17

**IMPLEMENTATION TASK LIST AND OUTLINE OF GUIDANCE
MATERIAL IN RELATION TO AMENDMENT 77 TO ANNEX 3**

1. IMPLEMENTATION TASK LIST

1.1 Essential steps to be followed by a State in order to implement the proposed amendment to Annex 3:

- a) identification of the rule-making process necessary to transpose the modified ICAO provisions into the national regulations;
- b) establishment of a national implementation plan that takes into account the modified ICAO provisions;
- c) drafting of the modification to the national regulations and means of compliance;
- d) official adoption of the national regulations and means of compliance;
- e) filing of State differences with ICAO, if necessary;
- f) development of software modifications for disseminating METAR/SPECI, TAF, SIGMET, AIRMET, volcanic ash advisories and tropical cyclone advisories in digital form;
- g) development of software modifications by service providers and users in order to ingest and take advantage of information provided in digital form;

Note. — The information provided in digital form will be in addition to the traditional alphanumeric products.

- h) development of software modifications by service providers and users to ingest and take advantage of additional WAFS forecast flight levels and information regarding cumulonimbus clouds, icing and turbulence;
- i) training of operational staff in the provision and use of new information;
- j) testing of software encoding, decoding and the communications infrastructure for the exchange of digital information both nationally and as part of the global exchange within regional requirements; and
- k) operational acceptance of software changes.

2. STANDARDIZATION PROCESS

2.1 Effective date: 11 July 2016

2.2 Applicability date: 10 November 2016 for the amendment relating to aeronautical meteorology and 5 November 2020 for the amendment relating to the global reporting format.

2.3 Embedded applicability date(s): not applicable

3. SUPPORTING DOCUMENTATION

3.1 ICAO documentation

Title	Type (PANS/TI/Manual/Circ)	Planned publication date
<i>Manual of Aeronautical Meteorological Practice</i> (Doc 8896)	Manual	October 2016
<i>Manual on the Digital Exchange of Aeronautical Meteorological Information</i> (Doc 10003)	Manual	October 2016

3.2 External documentation

Title	External Organization	Publication date
Manual on Codes No. 306	WMO	May 2016
Supporting documentation to No. 306	WMO	May to July 2016

4. IMPLEMENTATION ASSISTANCE TASKS

Type	Regional
Regional workshop on implementation of global reporting format	ICAO Regional Offices

5. UNIVERSAL SAFETY OVERSIGHT AUDIT PROGRAMME (USOAP)

5.1 No additional Universal Safety Oversight Audit Programme (USOAP) questions or modifications to existing questions are proposed.

IMPACT ASSESSMENT IN RELATION TO AMENDMENT 77 TO ANNEX 3

1. INTRODUCTION

1.1 Amendment 77 to Annex 3 introduces digital exchange for a number of aeronautical meteorological products as recommended practices as an early step towards the meteorological component of the future system-wide information management (SWIM) environment supporting global air traffic management (ATM). The amendment also introduces additional flight levels and meteorological parameters into the world area forecast system (WAFS).

2. IMPACT ASSESSMENT

2.1 *Safety impact:* Improved WAFS information will enhance users' situational awareness and further aid the avoidance of hazardous meteorological conditions. The benefits of more flexible exchange and use of digital meteorological information will include enhanced presentation of safety-related data components in an operational context.

2.2 *Financial impact:* The costs of implementing the exchange and use of digital meteorological information will be significant in the short term including software development and communications infrastructure testing. However, the efficiencies gained from the use of digital information are expected to outweigh those costs.

2.3 *Security impact:* No security impact is expected with this proposal.

2.4 *Environmental impact:* No significant environmental impact is expected other than a positive impact in combination with efficiencies which would reduce flight times.

2.5 *Efficiency impact:* More flexible information handling is expected to give rise to efficiencies together with improved WAFS forecast information enabling enhanced situational awareness and more efficient routing around hazardous meteorological conditions.

2.6 *Expected implementation time:* Parallel exchange of meteorological information in traditional alphanumeric code form will mitigate the expected implementation time of meteorological information in digital code form which could take some years to become globally implemented.

AMENDMENT No. 77-A

TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

**METEOROLOGICAL SERVICE FOR
INTERNATIONAL AIR NAVIGATION**

ANNEX 3

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

The amendment to Annex 3 contained in this document was adopted by the Council of ICAO on **22 February 2016**. Such parts of this amendment as have not been disapproved by more than half of the total number of Contracting States on or before **11 July 2016** will become effective on that date and will become applicable on **10 November 2016** as specified in the Resolution of Adoption. (State letter AN 10/1.1-16/17 refers.)

FEBRUARY 2016

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AMENDMENT 77 TO THE INTERNATIONAL STANDARDS AND
RECOMMENDED PRACTICES**

ANNEX 3 — METEOROLOGICAL SERVICE FOR INTERNATIONAL AIR NAVIGATION

RESOLUTION OF ADOPTION

The Council

Acting in accordance with the Convention on International Civil Aviation, and particularly with the provisions of Articles 37, 54 and 90 thereof,

1. *Hereby adopts* on 22 February 2016 Amendment 77 to the International Standards and Recommended Practices contained in the document entitled *International Standards and Recommended Practices, Meteorological Service for International Air Navigation* which for convenience is designated Annex 3 to the Convention;
2. *Prescribes* 11 July 2016 as the date upon which the said amendment shall become effective, except for any part thereof in respect of which a majority of the Contracting States have registered their disapproval with the Council before that date;
3. *Resolves* that the said amendment or such parts thereof as have become effective shall become applicable on 10 November 2016¹;
4. *Requests the Secretary General:*
 - a) to notify each Contracting State immediately of the above action and immediately after 11 July 2016 of those parts of the amendment which have become effective;
 - b) to request each Contracting State:
 - 1) to notify the Organization (in accordance with the obligation imposed by Article 38 of the Convention) of the differences that will exist on 10 November 2016¹ between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 10 October 2016², and thereafter to notify the Organization of any further differences that arise;
 - 2) to notify the Organization before 10 October 2016² of the date or dates by which it will have complied with the provisions of the Standards in the Annex as hereby amended;
 - c) to invite each Contracting State to notify additionally any differences between its own practices and those established by the Recommended Practices, following the procedure specified in subparagraph b) above with respect to differences from Standards.

¹ 5 November 2020 for Chapter 5 paragraph 5.5; Appendix 3, paragraph 4.8.1.5; Table A3-2, Supplementary information (C), Trend forecast (O); and Table A3-5, State of the runway.

² 5 October 2020 for Chapter 5 paragraph 5.5; Appendix 3, paragraph 4.8.1.5; Table A3-2, Supplementary information (C), Trend forecast (O); and Table A3-5, State of the runway.

**NOTES ON THE PRESENTATION OF THE
AMENDMENT 77-A TO ANNEX 3**

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. New text to be inserted is highlighted with grey shading. new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

TEXT OF AMENDMENT 77-A
TO THE
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES
METEOROLOGICAL SERVICE
FOR INTERNATIONAL AIR NAVIGATION
ANNEX 3
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

...

CHAPTER 1. DEFINITIONS

...

1.1 Definitions

...

~~**Automatic dependent surveillance (ADS).** A surveillance technique in which aircraft automatically provide, via a data link, data derived from on-board navigation and position fixing systems, including aircraft identification, four-dimensional position and additional data as appropriate.~~

Automatic dependent surveillance — contract (ADS-C). A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

Note.— The abbreviated term “ADS contract” is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.

...

Meteorological watch office. An office designated to provide information concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations within its specified area of responsibility.

...

SIGMET information. Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which and other phenomena in the atmosphere that may affect the safety of aircraft operations.

...

State volcano observatory. A volcano observatory, designated by regional air navigation agreement, to monitor active or potentially active volcanoes within a State and to provide information on volcanic activity to its associated area control centre/flight information centre, meteorological watch office and volcanic ash advisory centre.

...

World area forecast centre (WAFc). A meteorological centre designated to prepare and issue significant weather forecasts and upper-air forecasts in digital form on a global basis direct to States by appropriate means as part of using the aeronautical fixed service Internet-based services.

...

CHAPTER 2. GENERAL PROVISIONS

...

2.1 Objective, determination and provision of meteorological service

...

2.1.3 Each Contracting State shall determine the meteorological service which it will provide to meet the needs of international air navigation. This determination shall be made in accordance with the provisions of this Annex and with due regard to in accordance with regional air navigation agreements; it shall include the determination of the meteorological service to be provided for international air navigation over international waters and other areas which lie outside the territory of the State concerned.

...

2.2 Supply, use, and quality management and interpretation of meteorological information

...

~~2.2.6 **Recommendation.** Demonstration of compliance of the quality system applied should be by audit. If non-conformity of the system is identified, action should be initiated to determine and correct the cause. All audit observations should be evidenced and properly documented.~~

2.2.6 Demonstration of compliance of the quality system applied shall be by audit. If non-conformity of the system is identified, action shall be initiated to determine and correct the cause. All audit observations shall be evidence-based and properly documented.

...

*Insert new text as follows and renumber
subsequent paragraph accordingly:*

2.2.7 Owing to the variability of meteorological elements in space and time, to limitations of observing techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a report shall be understood by the recipient to be the best approximation to the actual conditions at the time of observation.

Note.— Guidance on the operationally desirable accuracy of measurement or observation is given in Attachment A.

2.2.8 Owing to the variability of meteorological elements in space and time, to limitations of forecasting techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a forecast shall be understood by the recipient to be the most probable value which the element is likely to assume during the period of the forecast. Similarly, when the time of occurrence or change of an element is given in a forecast, this time shall be understood to be the most probable time.

Note.— Guidance on the operationally desirable accuracy of forecasts is given in Attachment B.

End of new text.

...

2.3 Notifications required from operators

2.3.1 An operator requiring meteorological service or changes in existing meteorological service shall notify, sufficiently in advance, the meteorological authority or the aerodrome meteorological office concerned. The minimum amount of advance notice required shall be as agreed between the meteorological authority or aerodrome meteorological office and the operator concerned.

...

2.3.4 **Recommendation.**— *The notification to the aerodrome meteorological office of individual flights should contain the following information except that, in the case of scheduled flights, the requirement for some or all of this information may be waived ~~by agreement~~ as agreed between the aerodrome meteorological office and the operator concerned.*

...

CHAPTER 3. WORLD AREA FORECAST SYSTEM AND METEOROLOGICAL OFFICES

...

3.4 Meteorological watch offices

3.4.1 A Contracting State, having accepted the responsibility for providing air traffic services within a flight information region or a control area, shall establish, ~~on the basis of~~ in accordance with regional air navigation agreement, one or more meteorological watch offices, or arrange for another Contracting State to do so.

...

3.4.2 A meteorological watch office shall:

...

Note.— The information is provided by WMO regional specialized meteorological centres (RSMC) for the provision of transport model products for radiological environmental emergency response, at the request of the delegated authority of the State in which the radioactive material was released into the atmosphere, or the International Atomic Energy Agency (IAEA). The information is sent by the RSMC to a single contact point of the national meteorological service in each State. This contact point has the responsibility of redistributing the RSMC products within the State concerned. Furthermore, the information is provided by IAEA to RSMC co-located with VAAC London (designated as the focal point) which in turn notifies the ACCs/FICs concerned about the release.

...

3.5 Volcanic ash advisory centres

3.5.1 A Contracting State, having accepted, ~~by regional air navigation agreement,~~ the responsibility for providing a VAAC within the framework of the international airways volcano watch, shall arrange for that centre to respond to a notification that a volcano has erupted, or is expected to erupt or volcanic ash is reported in its area of responsibility, by arranging for that centre to:

- a) monitor relevant geostationary and polar-orbiting satellite data and, where available, relevant ground-based and airborne data, to detect the existence and extent of volcanic ash in the atmosphere in the area concerned;

Note.— Relevant ground-based and airborne data includes data derived from Doppler weather radar, ceilometers, lidar and passive infrared sensors.

...

- c) issue advisory information regarding the extent and forecast movement of the volcanic ash “cloud” to:

...

- 3) world area forecast centres, international OPMET databanks, international NOTAM offices, and centres designated by regional air navigation agreement for the operation of aeronautical fixed service ~~satellite distribution systems~~ Internet-based services; and

...

- d) issue updated advisory information to the meteorological watch offices, area control centres, flight information centres and VAACs referred to in c), as necessary, but at least every six hours until such time as:

- 1) the volcanic ash “cloud” is no longer identifiable from satellite data and, where available, ground-based and airborne data;

2) no further reports of volcanic ash are received from the area; and

3) no further eruptions of the volcano are reported.

...

3.6 State volcano observatories

Contracting States with active or potentially active volcanoes shall arrange that State volcano observatories, ~~as designated by regional air navigation agreement,~~ monitor these volcanoes and when observing:

...

shall send this information as quickly as practicable to their associated ACC/FIC, MWO and VAAC.

...

3.7 Tropical cyclone advisory centres

A Contracting State having accepted, ~~by regional air navigation agreement,~~ the responsibility for providing a TCAC shall arrange for that centre to:

...

b) issue advisory information concerning the position of the cyclone centre, its direction and speed of movement, central pressure and maximum surface wind near the centre, in abbreviated plain language to:

...

3) world area forecast centres, international OPMET databanks, and centres designated by regional air navigation agreement for the operation of aeronautical fixed service ~~satellite distribution systems~~ Internet-based services; and

...

CHAPTER 4. METEOROLOGICAL OBSERVATIONS AND REPORTS

Note.— *Technical specifications and detailed criteria related to this chapter are given in Appendix 3.*

4.1 Aeronautical meteorological stations and observations

...

~~4.1.9 Owing to the variability of meteorological elements in space and time, to limitations of observing techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a report shall be understood by the recipient to be the best approximation to the actual conditions at the time of observation.~~

~~— *Note.*— *Guidance on the operationally desirable accuracy of measurement or observation is given in Attachment A.*~~

...

4.3 Routine observations and reports

4.3.1 At aerodromes, routine observations shall be made throughout the 24 hours of each day, ~~except as~~ unless otherwise agreed between the meteorological authority, the appropriate ATS authority and the operator concerned. Such observations shall be made at intervals of one hour or, if so determined by regional air navigation agreement, at intervals of one half-hour. At other aeronautical meteorological stations, such observations shall be made as determined by the meteorological authority taking into account the requirements of air traffic services units and aircraft operations.

...

4.5 Contents of reports

4.5.1 Local routine reports, ~~and~~ local special reports, ~~and~~ METAR and SPECI shall contain the following elements in the order indicated:

...

4.5.2 **Recommendation.**— *In addition to elements listed under 4.5.1 a) to k), local routine reports, ~~and~~ local special reports, ~~and~~ METAR and SPECI should contain supplementary information to be placed after element k).*

...

4.6 Observing and reporting meteorological elements

...

4.6.6 Air temperature and dew-point temperature

...

4.6.6.2 **Recommendation.**— *Observations of air temperature and dew-point temperature for local routine reports, and local special reports, and METAR and SPECI should be representative of the whole runway complex.*

...

4.7 Reporting meteorological information from automatic observing systems

...

4.7.3 Local routine reports, and local special reports, and METAR and SPECI from automatic observing systems shall be identified with the word “AUTO”.

CHAPTER 5. AIRCRAFT OBSERVATIONS AND REPORTS

...

5.3 Routine aircraft observations — designation

5.3.1 **Recommendation.**— *When air-ground data link is used and automatic dependent surveillance — contract (ADS-C) or secondary surveillance radar (SSR) Mode S is being applied, automated routine observations should be made every 15 minutes during the en-route phase and every 30 seconds during the climb-out phase for the first 10 minutes of the flight.*

...

5.3.3 In the case of air routes with high-density air traffic (e.g. organized tracks), an aircraft from among the aircraft operating at each flight level shall be designated, at approximately hourly intervals, to make routine observations in accordance with 5.3.1. The designation procedures shall be subject to in accordance with regional air navigation agreement.

...

5.8 Relay of air-reports by air traffic services units

The meteorological authority concerned shall make arrangements with the appropriate ATS authority to ensure that, on receipt by the air traffic services units of:

...

- b) routine and special air-reports by data link communications, the air traffic services units relay them without delay to their associated meteorological watch office and, the WAFCs, and the centres designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.

...

CHAPTER 6. FORECASTS

Note.— *Technical specifications and detailed criteria related to this chapter are given in Appendix 5.*

6.1 Interpretation and Use of forecasts

~~6.1.1~~ Owing to the variability of meteorological elements in space and time, to limitations of forecasting techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a forecast shall be understood by the recipient to be the most probable value which the element is likely to assume during the period of the forecast. Similarly, when the time of occurrence or change of an element is given in a forecast, this time shall be understood to be the most probable time.

~~—~~ *Note.*— *Guidance on the operationally desirable accuracy of forecasts is given in Attachment B.*

~~—~~ 6.1.2 The issue of a new forecast by an aerodrome meteorological office, such as a routine aerodrome forecast, shall be understood to cancel automatically any forecast of the same type previously issued for the same place and for the same period of validity or part thereof.

6.2 Aerodrome forecasts

6.2.1 An aerodrome forecast shall be prepared, ~~on the basis of~~ in accordance with regional air navigation agreement, by the aerodrome meteorological office designated by the meteorological authority concerned.

...

6.3 Landing forecasts

...

6.3.3 A trend forecast shall consist of a concise statement of the expected significant changes in the meteorological conditions at that aerodrome to be appended to a local routine report, ~~or a local special report, or a METAR or SPECI.~~ The period of validity of a trend forecast shall be 2 hours from the time of the report which forms part of the landing forecast.

6.4 Forecasts for take-off

6.4.1 A forecast for take-off shall be prepared by the aerodrome meteorological office designated by the meteorological authority concerned ~~if required by agreement~~ as agreed between the meteorological authority and operators concerned.

...

6.5 Area forecasts for low-level flights

...

6.5.2 When the density of traffic operating below flight level 100 warrants the issuance of AIRMET information in accordance with 7.2.1, area forecasts for such operations shall be prepared in a format as agreed ~~upon~~ between the meteorological authorities in the States concerned. When abbreviated plain language is used, the forecast shall be prepared as a GAMET area forecast, employing approved ICAO abbreviations and numerical values; when chart form is used, the forecast shall be prepared as a combination of forecasts of upper wind and upper-air temperature, and of SIGWX phenomena. The area forecasts shall be issued to cover the layer between the ground and flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) and shall contain information on en-route weather phenomena hazardous to low-level flights, in support of the issuance of AIRMET information, and additional information required by low-level flights.

...

CHAPTER 7. SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 6.

7.1 SIGMET information

7.1.1 SIGMET information shall be issued by a meteorological watch office and shall give a concise description in abbreviated plain language concerning the occurrence and/or expected occurrence of specified en-route weather ~~phenomena, which~~ and other phenomena in the atmosphere that may affect the safety of aircraft operations, and of the development of those phenomena in time and space.

...

CHAPTER 8. AERONAUTICAL CLIMATOLOGICAL INFORMATION

Note.— *Technical specifications and detailed criteria related to this chapter are given in Appendix 7.*

8.1 General provisions

Note.— *In cases where it is impracticable to meet the requirements for aeronautical climatological information on a national basis, the collection, processing and storage of observational data may be effected through computer facilities available for international use, and the responsibility for the preparation of the required aeronautical climatological information may be delegated by agreement as agreed between the meteorological authorities concerned.*

8.1.1 Aeronautical climatological information required for the planning of flight operations shall be prepared in the form of aerodrome climatological tables and aerodrome climatological summaries. Such information shall be supplied to aeronautical users as agreed between the meteorological authority and ~~those~~ the users concerned.

...

8.2 Aerodrome climatological tables

Recommendation.— *Each Contracting State should make arrangements for collecting and retaining the necessary observational data and have the capability:*

...

b) *to make available such climatological tables to an aeronautical user within a time period as agreed between the meteorological authority and ~~that~~ the user concerned.*

...

CHAPTER 9. SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

Note.— *Technical specifications and detailed criteria related to this chapter are given in Appendix 8.*

9.1 General provisions

...

9.1.3 Meteorological information supplied to operators and flight crew members shall be up to date and include the following information, as ~~established by~~ agreed between the meteorological authority ~~in consultation with~~ and the operators concerned:

- a) forecasts of
 - 1) upper wind and upper-air temperature;
 - 2) upper-air humidity;

- 3) geopotential altitude of flight levels;
- 4) flight level and temperature of tropopause;
- 5) direction, speed and flight level of maximum wind; ~~and~~
- 6) SIGWX phenomena; ~~and~~
- 7) ~~cumulonimbus clouds, icing and turbulence.~~

Note 1.— Forecasts of upper-air humidity and geopotential altitude of flight levels are used only in automatic flight planning and need not be displayed.

Note 2.— Forecasts of cumulonimbus cloud, icing and turbulence are intended to be processed and, if necessary, visualized according to the specific thresholds relevant to user operations.

...

- g) ~~subject to~~ as determined by regional air navigation agreement, GAMET area forecast and/or area forecasts for low-level flights in chart form prepared in support of the issuance of AIRMET information, and AIRMET information for low-level flights relevant to the whole route;

...

9.1.10 Meteorological information shall be supplied to operators and flight crew members at the location to be determined by the meteorological authority, after consultation with the operators concerned and at the time ~~to be agreed upon~~ between the aerodrome meteorological office and the operator concerned. The service for pre-flight planning shall be confined to flights originating within the territory of the State concerned. At an aerodrome without an aerodrome meteorological office at the aerodrome, arrangements for the supply of meteorological information shall be as agreed ~~upon~~ between the meteorological authority and the operator concerned.

...

9.2 Briefing, consultation and display

Note.— The requirements for the use of automated pre-flight information systems in providing briefing, consultation and display are given in 9.4.

9.2.1 Briefing and/or consultation shall be provided, on request, to flight crew members and/or other flight operations personnel. Its purpose shall be to supply the latest available information on existing and expected meteorological conditions along the route to be flown, at the aerodrome of intended landing, alternate aerodromes and other aerodromes as relevant, either to explain and amplify the information contained in the flight documentation or, ~~if so~~ as agreed between the meteorological authority and the operator concerned, in lieu of flight documentation.

...

9.2.4 The required briefing, consultation, display and/or flight documentation shall normally be provided by the aerodrome meteorological office associated with the aerodrome of departure. At an aerodrome where these services are not available, arrangements to meet the requirements of flight crew members shall be as agreed ~~upon~~ between the meteorological authority and the operator concerned. In

exceptional circumstances, such as an undue delay, the aerodrome meteorological office associated with the aerodrome shall provide or, if that is not practicable, arrange for the provision of a new briefing, consultation and/or flight documentation as necessary.

9.2.5 Recommendation.— *The flight crew member or other flight operations personnel for whom briefing, consultation and/or flight documentation has been requested should visit the aerodrome meteorological office at the time agreed—upon between the aerodrome meteorological office and the operator concerned. Where local circumstances at an aerodrome make personal briefing or consultation impracticable, the aerodrome meteorological office should provide those services by telephone or other suitable telecommunications facilities.*

9.3 Flight documentation

Note.— *The requirements for the use of automated pre-flight information systems in providing flight documentation are given in 9.4.*

9.3.1 Flight documentation to be made available shall comprise information listed under 9.1.3 a) 1) and 6), b), c), e), f) and, if appropriate, g). However, ~~when agreed between the meteorological authority and operator concerned,~~ flight documentation for flights of two hours' duration or less, after a short stop or turnaround, shall be limited to the information operationally needed, as agreed between the meteorological authority and operator concerned, but in all cases the flight documentation shall at least comprise information on 9.1.3 b), c), e), f) and, if appropriate, g).

...

9.4 Automated pre-flight information systems for briefing, consultation, flight planning and flight documentation

...

9.4.2 **Recommendation.**— *Automated pre-flight information systems providing for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned should be ~~established by an agreement~~ as agreed between the meteorological authority and the ~~relevant~~ civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with Annex 15, 2.1.1 c).*

...

CHAPTER 11. REQUIREMENTS FOR AND USE OF COMMUNICATIONS

...

11.1 Requirements for communications

...

11.1.7 **Recommendation.**— *As agreed between the meteorological authority and the operators concerned, provision should be made to enable operators to establish suitable telecommunications facilities for obtaining meteorological information from aerodrome meteorological offices or other appropriate sources.*

...

11.1.9 **Recommendation.**— *The telecommunications facilities used for the exchange of operational meteorological information should be the aeronautical fixed service or, for the exchange of non-time critical operational meteorological information, the public Internet, subject to availability, satisfactory operation and bilateral/multilateral and/or regional air navigation agreements.*

Note 1.— ~~Three a~~Aeronautical fixed service ~~satellite distribution systems~~ Internet-based services, operated by the World Area Forecast Centres, providing for global coverage are used to support the global exchanges of operational meteorological information. ~~Provisions relating to the satellite distribution systems are given in Annex 10, Volume III, Part 1, 10.1 and 10.2.~~

...

PART II

APPENDICES AND ATTACHMENTS

...

APPENDIX 2. TECHNICAL SPECIFICATIONS RELATED TO WORLD AREA FORECAST SYSTEM AND METEOROLOGICAL OFFICES

(See Chapter 3 of this Annex.)

1. WORLD AREA FORECAST SYSTEM

...

1.2 Upper-air gridded forecasts

1.2.2 The grid point forecasts prepared by a WAFC shall comprise:

- a) wind and temperature data for flight levels 50 (850 hPa), 80 (750 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 210 (450 hPa), 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 320 (275 hPa), 340 (250 hPa), 360 (225 hPa), 390 (200 hPa), 410 (175 hPa), 450 (150 hPa), 480 (125 hPa) and 530 (100 hPa);

...

- d) humidity data for flight levels 50 (850 hPa), 80 (750 hPa), 100 (700 hPa), 140 (600 hPa) and 180 (500 hPa);

...

- i) geopotential altitude data for flight levels 50 (850 hPa), 80 (750 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 210 (450 hPa), 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 320 (275 hPa), 340 (250 hPa), 360 (225 hPa), 390 (200 hPa), 410 (175 hPa), 450 (150 hPa), 480 (125 hPa) and 530 (100 hPa).

...

3. VOLCANIC ASH ADVISORY CENTRES (VAAC)

3.1 Volcanic ash advisory information

...

~~3.1.2 The volcanic ash advisory information listed in Table A2-1, when prepared in graphical format, shall be as specified in Appendix 1 and issued using:~~

- ~~a) the portable network graphics (PNG) format; or~~
- ~~b) the BUFR code form, when exchanged in binary format.~~

~~— Note. — The BUFR code form is contained in WMO Publication No. 306, Manual on Codes, Volume I.2, Part B — Binary Codes.~~

Insert new text as follows:

3.1.2 **Recommendation.**— *Volcanic ash advisory centres should issue volcanic ash advisory information in digital form in addition to the issuance of this advisory information in abbreviated plain language in accordance with 3.1.1.*

3.1.3 Volcanic ash advisory information, if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).

3.1.4 Volcanic ash advisory information if disseminated in digital form shall be accompanied by the appropriate metadata.

Note.— *Guidance on the information exchange model, XML/GML and the metadata profile is provided in the Manual on the Digital Exchange of Aeronautical Meteorological Information (Doc 10003).*

3.1.5 The volcanic ash advisory information listed in Table A2-1, when prepared in graphical format, shall be as specified in Appendix 1 and issued using the portable network graphics (PNG) format.

End of new text.

4. STATE VOLCANO OBSERVATORIES

4.1 Information from State volcano observatories

Recommendation.— *The information required to be sent by State volcano observatories to their associated ACCs/FICs, MWO and VAAC should comprise:*

...

Note 2.— *The State volcano observatories may use the Volcano Observatory Notice for Aviation (VONA) format to send information to ~~its~~ their associated ACCs/FICs, MWO and VAAC. The VONA format is included in the Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766) which is available on the ICAO IAVWOPSG website.*

5. TROPICAL CYCLONE ADVISORY CENTRES (TCAC)

5.1 Tropical cyclone advisory information

...

~~— 5.1.3 **Recommendation.** — The tropical cyclone advisory information listed in Table A2-2, when prepared in graphical format, should be as specified in Appendix 1 and issued using:~~

~~— a) the portable network graphics (PNG) format; or~~

~~b) the BUFR code form, when exchanged in binary format.~~

~~Note.— The BUFR code form is contained in WMO Publication No. 306, Manual on Codes, Volume I.2, Part B—Binary Codes.~~

Insert new text as follows:

5.1.3 **Recommendation.**— *Tropical cyclone advisory centres should issue tropical cyclone advisory information in digital form in addition to the issuance of this advisory information in abbreviated plain language in accordance with 5.1.2.*

5.1.4 Tropical cyclone advisory information, if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).

5.1.5 Tropical cyclone advisory information if disseminated in digital form shall be accompanied by the appropriate metadata.

Note.— Guidance on the information exchange model, XML/GML and the metadata profile is provided in the Manual on the Digital Exchange of Aeronautical Meteorological Information (Doc 10003).

5.1.6 The tropical cyclone advisory information listed in Table A2-2, when prepared in graphical format, shall be as specified in Appendix 1 and issued using the portable network graphics (PNG) format.

End of new text.

...

APPENDIX 3. TECHNICAL SPECIFICATIONS RELATED TO METEOROLOGICAL OBSERVATIONS AND REPORTS

...

2. GENERAL CRITERIA RELATED TO METEOROLOGICAL REPORTS

2.1 Format of meteorological reports

...

2.1.3 **Recommendation.**— *METAR and SPECI should be disseminated, under bilateral agreements between States in a position to do so, in digital form, in addition to the dissemination of the METAR and SPECI in accordance with 2.1.2.*

...

2.3 Criteria for issuance of local special reports and SPECI

2.3.1 The list of criteria for the issuance of local special reports shall include the following:

...

- e) ~~from 13 November 2014,~~ when noise abatement procedures are applied in accordance with 7.2.7 of the PANS-ATM (Doc 4444) and the variation from the mean surface wind speed (gusts) has changed by 2.5 m/s (5 kt) or more from that at the time of the latest report, the mean speed before and/or after the change being 7.5 m/s (15 kt) or more; and

...

2.3.3 **Recommendation.**— *Where required in accordance with Chapter 4, 4.4.2 b), SPECI should be issued whenever changes in accordance with the following criteria occur:*

...

- h) *any other criteria based on local aerodrome operating minima, as agreed between the meteorological authority and the operators concerned.*

...

3. DISSEMINATION OF METEOROLOGICAL REPORTS

3.1 METAR and SPECI

3.1.1 METAR and SPECI shall be disseminated to international OPMET databanks and the centres designated by regional air navigation agreement for the operation of aeronautical fixed service ~~satellite distribution systems~~ Internet-based services, in accordance with regional air navigation agreement.

...

3.2 Local routine and special reports

...

3.2.2 Local special reports shall be transmitted to local air traffic services units as soon as the specified conditions occur. However, ~~by agreement~~ as agreed between the meteorological authority and the appropriate ATS authority concerned, they need not be issued in respect of:

...

4. OBSERVING AND REPORTING OF METEOROLOGICAL ELEMENTS

4.1 Surface wind

...

4.1.3 Averaging

...

4.1.3.2 **Recommendation.**— *The averaging period for measuring variations from the mean wind speed (gusts) reported in accordance with 4.1.5.2 c) should be 3 seconds for local routine reports, ~~and local special reports, and for METAR, and SPECI~~ and for wind displays used for depicting variations from the mean wind speed (gusts) in air traffic services units.*

...

4.1.5 Reporting

4.1.5.1 In local routine reports, ~~and local special reports, and in~~ METAR and SPECI, the surface wind direction and speed shall be reported in steps of 10 degrees true and 1 metre per second (or 1 knot), respectively. Any observed value that does not fit the reporting scale in use shall be rounded to the nearest step in the scale.

4.1.5.2 In local routine reports, ~~and local special reports, and in~~ METAR and SPECI:

...

c) variations from the mean wind speed (gusts) during the past 10 minutes shall be reported when the maximum wind speed exceeds the mean speed by:

- 1) ~~from 13 November 2014,~~ 2.5 m/s (5 kt) or more in local routine and special reports when noise abatement procedures are applied in accordance with ~~paragraph 7.2.7 of the PANS-ATM (Doc 4444); or~~

...

4.2 Visibility

...

4.2.4 Reporting

4.2.4.1 In local routine reports, ~~and local special reports, and in~~ METAR and SPECI, the visibility shall be reported in steps of 50 m when the visibility is less than 800 m; in steps of 100 m, when it is 800 m or more but less than 5 km; in kilometre steps, when the visibility is 5 km or more but less than 10 km; and it shall be given as 10 km when the visibility is 10 km or more, except when the conditions for the use of CAVOK apply. Any observed value which does not fit the reporting scale in use shall be rounded down to the nearest lower step in the scale.

...

4.3 Runway visual range

...

4.3.5 Runway light intensity

Recommendation.— *When instrumented systems are used for the assessment of runway visual range, computations should be made separately for each available runway. ~~Runway visual range should not be computed for a light intensity of 3 per cent or less of the maximum light intensity available on a runway.~~ For local routine and special reports, the light intensity to be used for the computation should be:*

- a) *for a runway with the lights switched on and the light intensity of more than 3 per cent of the maximum light intensity available, the light intensity actually in use on that runway; ~~and~~*
- b) *for a runway with the lights switched on and the light intensity of 3 per cent or less of the maximum light intensity available, the optimum light intensity that would be appropriate for operational use in the prevailing conditions; and*
- ~~b)~~c) *for a runway with lights switched off (or at the lowest setting pending the resumption of operations), the optimum light intensity that would be appropriate for operational use in the prevailing conditions.*

...

4.3.6 Reporting

4.3.6.1 In local routine reports, and local special reports, ~~and in~~ METAR and SPECI, the runway visual range shall be reported in steps of 25 m when the runway visual range is less than 400 m; in steps of 50 m when it is between 400 m and 800 m; and in steps of 100 m when the runway visual range is more than 800 m. Any observed value which does not fit the reporting scale in use shall be rounded down to the nearest lower step in the scale.

4.3.6.2 **Recommendation.**— *Fifty metres should be considered the lower limit and 2 000 metres the upper limit for runway visual range. Outside of these limits, local routine reports, ~~and~~ local special reports, ~~and~~ METAR and SPECI should merely indicate that the runway visual range is less than 50 m or more than 2 000 m.*

4.3.6.3 In local routine reports, and local special reports, ~~and in~~ METAR and SPECI:

...

4.4 Present weather

4.4.1 Siting

Recommendation.— *When instrumented systems are used for observing present weather phenomena listed under 4.4.2.3, ~~4.4.2.5 and 4.4.2.6,~~ and 4.4.2.4 representative information should be obtained by the use of sensors appropriately sited.*

4.4.2 Reporting

...

4.4.2.3 **Recommendation.**— *In local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI, the following types of present weather phenomena should be reported, using their respective abbreviations and relevant criteria, as appropriate:*

...

4.4.2.4 **Recommendation.**— *In automated local routine reports, ~~and~~ local special reports, ~~and~~ METAR and SPECI, in addition to the precipitation types listed under 4.4.2.3 a), the abbreviation UP should be used for unidentified precipitation when the type of precipitation cannot be identified by the automatic observing system.*

4.4.2.5 In local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI, the following characteristics of present weather phenomena, as necessary, shall be reported, using their respective abbreviations and relevant criteria, as appropriate:

...

4.4.2.6 **Recommendation.**— *In local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI, the following characteristics of present weather phenomena, as necessary, should be reported, using their respective abbreviations and relevant criteria, as appropriate:*

...

4.4.2.7 **Recommendation.**— *In automated local routine reports, local special reports, METAR and SPECI when showers (SH) referred to in 4.4.2.6 cannot be determined based upon a method that takes account of the presence of convective cloud, the precipitation should not be characterized by SH.*

4.4.2.8 **Recommendation.**— *In local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI, the relevant intensity or, as appropriate, the proximity to the aerodrome of the reported present weather phenomena should be indicated as follows:*

...

4.4.2.89 In local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI:

- a) one or more, up to a maximum of three, of the present weather abbreviations given in 4.4.2.3; 4.4.2.5 and 4.4.2.64 shall be used, as necessary, together with an indication, where appropriate, of the characteristics given in 4.4.2.5 and 4.4.2.6 and intensity or proximity to the aerodrome given in 4.4.2.8, so as to convey a complete description of the present weather of significance to flight operations;

...

4.4.2.910 **Recommendation.**— *In automated local routine reports, ~~and~~ local special reports, ~~and~~ METAR and SPECI, the present weather should be replaced by “//” when the present weather cannot be observed by the automatic observing system due to a temporary failure of the system/sensor.*

4.5 Clouds

4.5.1 Siting

Recommendation.— *When instrumented systems are used for the measurement of the cloud amount and the height of cloud base, representative observations should be obtained by the use of sensors appropriately sited. For local routine and special reports, in the case of aerodromes with precision approach runways, sensors for cloud amount and height of cloud base should be sited to give the best practicable indications of the cloud amount and height of cloud base ~~and cloud amount at the middle marker site of the instrument landing system or, at aerodromes where a middle marker beacon is not used, at a distance of~~ threshold of the runway in use. For that purpose, a sensor should be installed at a distance of less than ~~900 to~~ 1 200 m (3 000 to 4 000 ft) ~~from before the landing threshold at the approach end of the runway.~~*

— *Note.*— *Specifications concerning the middle marker site of an instrument landing system are given in Annex 10, Volume I, Chapter 3 and at Attachment C, Table C-5.*

...

4.5.4 Reporting

4.5.4.1 In local routine reports, and local special reports, and in METAR and SPECI, the height of cloud base shall be reported in steps of 30 m (100 ft) up to 3 000 m (10 000 ft). ~~Any observed value which does not fit the reporting scale in use shall be rounded down to the nearest lower step in the scale.~~

4.5.4.2 **Recommendation.**— *At aerodromes where low-visibility procedures are established for approach and landing, as agreed between the meteorological authority and the appropriate ATS authority concerned, in local routine and special reports the height of cloud base should be reported in steps of 15 m (50 ft) up to and including 90 m (300 ft) and in steps of 30 m (100 ft) between 90 m (300 ft) and 3 000 m (10 000 ft), and the vertical visibility in steps of 15 m (50 ft) up to and including 90 m (300 ft) and in steps of 30 m (100 ft) between 90 m (300 ft) and 600 m (2 000 ft). ~~Any observed value which does not fit the reporting scale shall be rounded down to the nearest lower step in the scale.~~*

4.5.4.3 **Recommendation.**— *In local routine reports, and local special reports, and in METAR and SPECI:*

...

4.5.4.4 Any observed value in 4.5.4.1, 4.5.4.2 and 4.5.4.3 c) which does not fit the reporting scale in use shall be rounded down to the nearest lower step in the scale.

4.5.4.45 In local routine and special reports:

- a) the units of measurement used for the height of cloud base and vertical visibility shall be indicated; and
- b) when there is more than one runway in use and the heights of cloud bases are observed by instruments for these runways, the available heights of cloud bases for each runway shall be reported and the runways to which the values refer shall be indicated.

4.5.4.56 **Recommendation.**— *In automated local routine reports, ~~and~~ local special reports, ~~and~~ METAR and SPECI:*

...

4.6 Air temperature and dew-point temperature

...

4.6.2 Reporting

4.6.2.1 In local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI, the air temperature and the dew-point temperature shall be reported in steps of whole degrees Celsius. Any observed value which does not fit the reporting scale in use shall be rounded to the nearest whole degree Celsius, with observed values involving 0.5° rounded up to the next higher whole degree Celsius.

4.6.2.2 In local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI, a temperature below 0°C shall be identified.

4.7 Atmospheric pressure

...

4.7.3 Reporting

4.7.3.1 For local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI, QNH and QFE shall be computed in tenths of hectopascals and reported therein in steps of whole hectopascals, using four digits. Any observed value which does not fit the reporting scale in use shall be rounded down to the nearest lower whole hectopascal.

4.7.3.2 In local routine and special reports:

...

- b) QFE shall be included if required by users or, ~~if so as~~ agreed ~~locally~~ between the meteorological authority, ~~and air traffic services~~ the ATS authorities and the operators concerned, on a regular basis;

...

4.8 Supplementary information

4.8.1 Reporting

4.8.1.1 **Recommendation.**— *In local routine reports, ~~and~~ local special reports, ~~and in~~ METAR and SPECI, the following recent weather phenomena, i.e. weather phenomena observed at the aerodrome during the period since the last issued routine report or last hour, whichever is the shorter, but not at the time of observation, should be reported, up to a maximum of three groups, in accordance with the templates shown in Tables A3-1 and A3-2, in the supplementary information:*

...

4.8.1.3 **Recommendation.**— *In automated local routine reports, and local special reports, and METAR and SPECI, in addition to the recent weather phenomena listed under 4.8.1.1, recent unknown precipitation should be reported in accordance with the template shown in Table A3-2 when the type of precipitation cannot be identified by the automatic observing system.*

...

Table A3-1. Template for the local routine (MET REPORT) and local special (SPECIAL) reports

Key: M = inclusion mandatory, part of every message;
 C = inclusion conditional, dependent on meteorological conditions;
 O = inclusion optional.

Note 1.— The ranges and resolutions for the numerical elements included in the local routine and special reports are shown in Table A3-4 of this appendix.

Note 2.— The explanations for the abbreviations can be found in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

<i>Element as specified in Chapter 4</i>	<i>Detailed content</i>	<i>Template(s)</i>		<i>Examples</i>
...				
Present weather (C) ^{9, 10}	Intensity of present weather (C) ⁹	FBL or MOD or HVY	—	
	Characteristics and type of present weather (C) ^{9, 11}	DZ or RA or SN or SG or PL or DS or SS or FZDZ or FZUP ¹² or FC ¹³ or FZRA or SHGR or SHGS or SHRA or SHSN or SHUP ¹² or TSGR or TSGS or TSRA or TSSN or TSUP ¹² or UP ¹²	FG or BR or SA or DU or HZ or FU or VA or SQ or PO or FC or TS or BCFG or BLDU or BLSA or BLSN or DRDU or DRSA or DRSN or FZFG or MIFG or PRFG or // ¹²	MOD RA HVY TSRA HVY DZ FBL SN HZ FG VA MIFG HVY TSRASN FBL SNRA FBL DZ FG HVY SHSN BLSN HVY TSUP //
...				

...

Table A3-2. Template for METAR and SPECI

Key: M = inclusion mandatory, part of every message;
 C = inclusion conditional, dependent on meteorological conditions or method of observation;
 O = inclusion optional.

Note 1.— The ranges and resolutions for the numerical elements included in METAR and SPECI are shown in Table A3-5 of this appendix.

Note 2.— The explanations for the abbreviations can be found in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

Element as specified in Chapter 4	Detailed content	Template(s)			Examples	
• • •						
Surface wind (M)	Wind direction (M)	nnn	VRB		24004MPS (24008KT)	VRB01MPS (VRB02KT)
	Wind speed (M)	[P]nn[n]			19006MPS (19012KT) 00000MPS (00000KT) 140P149MPS (140P99KT)	
	Significant speed variations (C) ³	G[P]nn[n]			12003G09MPS (12006G18KT)	
	Units of measurement (M)	MPS (or KT)			24008G14MPS (24016G28KT)	
	Significant directional variations (C) ⁴	nnnVnnn	—		02005MPS 350V070 (02010KT 350V070)	
• • •						
Cloud (M) ¹⁴	Cloud amount and height of cloud base or vertical visibility (M)	FEWnnn or SCTnnn or BKNnnn or OVCnnn or FEW/// ¹² or SCT/// ¹² or BKN/// ¹² or OVC/// ¹² or ///nnn ¹² or ////// ¹²	VVnnn or VV/// ¹²	NSC or NCD ¹²	FEW015 VV005 OVC030 VV///	VV005 VV/// NSC
	Cloud type (C) ²	CB or TCU or /// ¹²	—		SCT010 OVC020 BKN///	///015
• • •						
					BKN009TCU NCD SCT008 BKN025CB BKN025/// //////CB	

Table A3-4. Ranges and resolutions for the numerical elements included in local reports

...

** Under circumstances as specified in 4.5.4.32; otherwise a resolution of 30 m (100 ft) is to be used.

APPENDIX 4. TECHNICAL SPECIFICATIONS RELATED TO AIRCRAFT OBSERVATIONS AND REPORTS

(See Chapter 5 of this Annex.)

1. CONTENTS OF AIR-REPORTS

1.1 Routine air-reports by air-ground data link

1.1.1 When air-ground data link is used and automatic dependent surveillance — contract (ADS-C) or SSR Mode S is being applied, the elements contained in routine air-reports shall be:

...

Note.— When ADS-C or SSR Mode S is being applied, the requirements of routine air-reports may be met by the combination of the basic ADS-C/SSR Mode S data block (data block 1) and the meteorological information data block (data block 2), available from ADS-C or SSR Mode S reports. The ADS-C message format is specified in the PANS-ATM (Doc 4444), 4.11.4 and Chapter 13 and the SSR Mode S message format is specified in Annex 10, Volume III, Part I — Digital Data Communication Systems, Chapter 5.

1.1.2 When air-ground data link is used while ADS-C and SSR Mode S are not being applied, the elements contained in routine reports shall be:

...

Note.— When air-ground data link is used while ADS-C and SSR Mode S are not being applied, the requirements of routine air-reports may be met by the controller-pilot data link communication (CPDLC) application entitled “Position report”. The details of this data link application are specified in the Manual of Air Traffic Services Data Link Applications (Doc 9694) and in Annex 10, Volume III, Part I.

...

3. EXCHANGE OF AIR-REPORTS

3.1 Responsibilities of the meteorological watch offices

3.1.1 The meteorological watch office shall transmit without delay the special air-reports received by voice communications to the WAFCs and the centres designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.

...

3.1.3 When a special air-report is received at the meteorological watch office but the forecaster considers that the phenomenon causing the report is not expected to persist and, therefore, does not warrant issuance of a SIGMET, the special air-report shall be disseminated in the same way that SIGMET messages are disseminated in accordance with Appendix 6, 1.2.1, i.e. to meteorological watch offices, WAFCs, and other meteorological offices in accordance with regional air navigation agreement.

Note.— The template used for special air-reports which are uplinked to aircraft in flight is in Appendix 6, Table-A6-1 A6-1B.

...

3.3 Supplementary dissemination of air-reports

Recommendation.— *Where supplementary dissemination of air-reports is required to satisfy special aeronautical or meteorological requirements, such dissemination should be arranged and agreed between the meteorological authorities concerned.*

...

APPENDIX 5. TECHNICAL SPECIFICATIONS RELATED TO FORECASTS

(See Chapter 6 of this Annex.)

1. CRITERIA RELATED TO TAF

1.1 TAF format

...

1.1.2 **Recommendation.**— *TAF should be disseminated, ~~under bilateral agreements between States in a position to do so,~~ in digital form, in addition to the dissemination of the TAF in accordance with 1.1.1.*

...

1.2 Inclusion of meteorological elements in TAF

...

1.2.3 Weather phenomena

One or more, up to a maximum of three, of the following weather phenomena or combinations thereof, together with their characteristics and, where appropriate, intensity, shall be forecast if they are expected to occur at the aerodrome:

...

- other weather phenomena given in Appendix 3, 4.4.2.3, as agreed by ~~with~~ between the meteorological authority, with the appropriate ATS authority and operators concerned.

...

1.3 Use of change groups

...

1.3.2 **Recommendation.**— *The criteria used for the inclusion of change groups in TAF or for the amendment of TAF should be based on the following:*

...

- j) *any other criteria based on local aerodrome operating minima, as agreed between the meteorological authority and the operators concerned.*

...

1.6 Dissemination of TAF

TAF and amendments thereto shall be disseminated to international OPMET databanks and the centres designated by regional air navigation agreement for the operation of aeronautical fixed service ~~satellite distribution systems~~ Internet-based services, in accordance with regional air navigation agreement.

...

Table A5-1. Template for TAF

Key: M = inclusion mandatory, part of every message;
 C = inclusion conditional, dependent on meteorological conditions or method of observation;
 O = inclusion optional.

Note 1.— The ranges and resolutions for the numerical elements included in TAF are shown in Table A5-4 of this appendix.

Note 2.— The explanations for the abbreviations can be found in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

<i>Element as specified in Chapter 6</i>	<i>Detailed content</i>	<i>Template(s)</i>	<i>Examples</i>
...			
Days and period of validity of forecast (M)	Days and period of the validity of the forecast in UTC (M)	nnnn/nnnn	1606/1624 0812/0918
...			

...

Table A5-3. Template for GAMET

Key: M = inclusion mandatory, part of every message;
 C = inclusion conditional, dependent on meteorological conditions;
 O = inclusion optional;
 = = a double line indicates that the text following it should be placed on the subsequent line.

Element	Detailed content	Template(s)	Examples
Location indicator of FIR/CTA (M)	ICAO location indicator of the ATS unit serving the FIR or CTA to which the GAMET refers (M)	nnnn	YUCC ¹
Identification (M)	Message identification (M)	GAMET	GAMET
Validity period (M)	Day-time groups indicating the period of validity in UTC (M)	VALID nnnnnn/hnnnnn	VALID 220600/221200
Location indicator of aerodrome meteorological office or meteorological watch office (M)	Location indicator of aerodrome meteorological office or meteorological watch office originating the message with a separating hyphen (M)	nnnn-	YUDO- ¹
Name of the FIR/CTA or part thereof (M)	Location indicator and name of the FIR/CTA, or part thereof for which the GAMET is issued (M)	nnnn nnnnnnnnnn FIR/[n] [BLW FLnnn] or nnnn nnnnnnnnnn CTA/[n] [BLW FLnnn]	YUCC AMSWELL FIR/2 BLW FL120 YUCC AMSWELL FIR

Editorial note.— In the following part of the template, the order of the columns titled “Content” and “Location” has been reversed.

Element	Detailed content	Template(s)			Examples
		Identifier and time	Location	Content	
Indicator for the beginning of Section I (M)	Indicator to identify the beginning of Section I (M)	SECN I			SECN I
Surface wind (C)	Widespread surface wind exceeding 15 m/s (30 kt)	SFC WSPDWIND: [nn/nn]	[N ofOF Nnn or Snn] or [S ofOF Nnn or Snn] or [W ofOF Wnnn or Ennn] or [E ofOF Wnnn or Ennn] or [nnnnnnnnnn] ²	[n]nn MPS (or [n]nn KT) nnn/[n]nnMPS (or nnn/[n]nnKT)	SFC WSPD: 10/12 16 MPS SFC WIND: 10/12 310/16MPS SFC WSPD: 40 KT-E-OF W110 SFC WIND: E OF W110 050/40KT
Surface visibility (C)	Widespread surface visibility below 5 000 m including the weather phenomena causing the reduction in visibility	SFC VIS: [nn/nn]		nnnn M nnnnM FG or BR or SA or DU or HZ or FU or VA or PO or DS or SS or DZ or RA or SN or SG or FC or GR or GS or PL or SQ	SFC VIS: 06/08 3000 M BR N of N51 SFC VIS: 06/08 N OF N51 3000M BR

Element	Detailed content	Template(s)			Examples
		Identifier and time	Location	Content	
Significant weather (C)	Significant weather conditions encompassing thunderstorms, and heavy sandstorm and duststorm, and volcanic ash	SIGWX: [nn/nn]		ISOL TS or OCNL TS or FRQ TS or OBSC TS or EMBD TS or HVY DS or HVY SS or SQL TS or ISOL TSGR or OCNL TSGR or FRQ TSGR or OBSC TSGR or EMBD TSGR or SQL TSGR or VA	SIGWX: 11/12 ISOL TS SIGWX: 12/14 SS S OF N35 SIGWX: 12/14 S OF N35 HVY SS
Mountain obscuration (C)	Mountain obscuration	MT OBSC: [nn/nn]		nnnnnnnnn ²	MT OBSC: MT PASSES S OF N48 MT OBSC: S OF N48 MT PASSES
Cloud (C)	Widespread areas of broken or overcast cloud with height of base less than 300 m (1 000 ft) above ground level (AGL) or above mean sea level (AMSL) and/or any occurrence of cumulonimbus (CB) or towering cumulus (TCU) clouds	SIG CLD: [nn/nn]		BKN or OVC nnn[n]/nnn[n] M (or nnn[n]/nnn[n] FT) [n]nnn/[n]nnnM (or [n]nnn/[n]nnnFT) AGL or AMSL ISOL or OCNL or FRQ or OBSC or EMBD CB ³ or TCU ³ nnn[n]/nnn[n] M or nnn[n]/nnn[n] FT [n]nnn/[n]nnnM (or [n]nnn/[n]nnnFT) AGL or AMSL	SIG CLD: 06/09 OVC 800/1100 FT AGL N OF N51 10/12 ISOL TCU 1200/8000 FT AGL SIG CLD: 06/09 N OF N51 OVC 800/1100FT AGL 10/12 ISOL TCU 1200/8000FT AGL
Icing (C)	Icing (except for that occurring in convective clouds and for severe icing for which a SIGMET message has already been issued)	ICE: [nn/nn]		MOD FLnnn/nnn or MOD ABV FLnnn or SEV FLnnn/nnn or SEV ABV FLnnn	ICE: MOD FL050/080
Turbulence (C)	Turbulence (except for that occurring in convective clouds and for severe turbulence for which a SIGMET message has already been issued)	TURB: [nn/nn]		MOD FLnnn/nnn or MOD ABV FLnnn or SEV FLnnn/nnn or SEV ABV FLnnn	TURB: MOD ABV FL090
Mountain wave (C)	Mountain wave (except for severe mountain wave for which a SIGMET message has already been issued)	MTW: [nn/nn]		MOD FLnnn/nnn or MOD ABV FLnnn or SEV FLnnn/nnn or SEV ABV FLnnn	MTW: MOD ABV FL080 N OF N63 MTW: N OF N63 MOD ABV FL080
SIGMET (C)	SIGMET messages applicable to the FIR/CTA concerned or a sub-area thereof, for which the area forecast is valid	SIGMET APPLICABLE:	—	n [n] [n] [n][n] ⁴	SIGMET APPLICABLE: 3, A5, B06
or HAZARDOUS WX NIL (C) ⁴⁵		HAZARDOUS WX NIL			HAZARDOUS WX NIL

Element	Detailed content	Template(s)			Examples
		Identifier and time	Location	Content	
Indicator for the beginning of Section II (M)	Indicator to identify the beginning of Section II (M)	SECN II			SECN II
Pressure centres and fronts (M)	Pressure centres and fronts and their expected movements and developments	PSYS: [nn]	Nnnnn or Snnnn Wnnnnn or Ennnnn or Nnnnn or Snnnn Wnnnnn or Ennnnn TO Nnnnn or Snnnn Wnnnnn or Ennnnn	L [n]nnn HPA or H [n]nnn HPA L [n]nnn HPA or H [n]nnn HPA or FRONT or NIL	PSYS: 06 L 1004 HPA N5130 E01000 MOV NE 25KT WKN PSYS: 06 N5130 E01000 L 1004 HPA MOV NE 25KT WKN
			—	MOV N or MOV NE or MOV E or MOV SE or MOV S or MOV SW or MOV W or MOV NW nnKMH (or nnKT) WKN or NC or INTSF	
Upper winds and temperatures (M)	Upper winds and upper-air temperatures for at least the following altitudes: 600, 1 500 and 3 000 m (2 000, 5 000 and 10 000 ft)	WIND/T:	Nnnnn or Snnnn Wnnnnn or Ennnnn or	[n]nnn M (or [n]nnn FT) nnn/[n]nn MPS (or nnn/[n]nn KT) [n]nnnM (or [n]nnnFT) nnn/[n]nnMPS (or nnn/[n]nnKT) PSnn or MSnn	WIND/T: 2000 FT 270/18 MPS PS03 5000 FT 250/20 MPS MS02 10000 FT 240/22 MPS MS11 WIND/T: 2000FT N5500 W01000 270/18MPS PS03 5000FT N5500 W01000 250/20MPS MS02 10000FT N5500 W01000 240/22MPS MS11
Cloud (M)	Cloud information not included in Section I giving type, height of base and top above ground level (AGL) or above mean sea level (AMSL)	CLD: [nn/nn]	[N of OF Nnn or Snn] or [S of OF Nnn or Snn] or [W of OF Wnnn or Ennn] or [E of OF Wnnn or Ennn] or [nnnnnnnnn] ²	FEW or SCT or BKN or OVC ST or SC or CU or AS or AC or NS [n]nnn/[n]nnn M (or [n]nnn/[n]nnn FT) [n]nnn/[n]nnnM (or [n]nnn/[n]nnnFT) AGL or AMSL or NIL	CLD: BKN SC 2500/8000 FT2500/8000FT AGL CLD: NIL
Freezing level (M)	Height indication of 0°C level(s) above ground level (AGL) or above mean sea level (AMSL), if lower than the top of the airspace for which the forecast is supplied	FZLVL:		[ABV] nnnn FT [n]nnnFT AGL or AMSL	FZLVL: 3000 FT 3000FT AGL
Forecast QNH (M)	Forecast lowest QNH during the period of validity	MNM QNH:		[n]nnn HPA [n]nnn HPA	MNM QNH: 1004 HPA 1004 HPA
Sea-surface temperature and state of the sea (O)	Sea-surface temperature and state of the sea if required by regional air navigation agreement	SEA:		Tnn HGT [n]n M[n]nM	SEA: T15 HGT 5 M5M
Volcanic eruptions (M)	Name of volcano	VA:		nnnnnnnnn or NIL	VA: ETNA VA: NIL

Notes.—

1. Fictitious location.
2. Free text describing well-known geographical locations should be kept to a minimum.
3. The location of the CB and/or TCU should be specified in addition to any widespread areas of broken or overcast cloud as given in the example.
4. Repeat as necessary, with comma separating.
- 4.5. When no elements are included in Section I.

...

Example A5-1. TAF

TAF for YUDO (Donlon/International):*

TAF YUDO ~~460000~~151800Z 1606/162418 13005MPS 9000 BKN020 BECMG 1606/1608
SCT015CB BKN020 TEMPO 1608/1612 17006G12MPS 1000 TSRA SCT010CB BKN020 FM161230
15004MPS 9999 BKN020

Meaning of the forecast:

TAF for Donlon/International* issued on the 15th of the month at ~~00~~1800 UTC valid from 060000 UTC to ~~2400~~1800 UTC on the 16th of the month; surface wind direction 130 degrees; wind speed 5 metres per second; visibility 9 kilometres, broken cloud at 600 metres; becoming between 0600 UTC and 0800 UTC on the 16th of the month, scattered cumulonimbus cloud at 450 metres and broken cloud at 600 metres; temporarily between 0800 UTC and 1200 UTC on the 16th of the month surface wind direction 170 degrees; wind speed 6 metres per second gusting to 12 metres per second; visibility 1 000 metres in a thunderstorm with moderate rain, scattered cumulonimbus cloud at 300 metres and broken cloud at 600 metres; from 1230 UTC on the 16th of the month surface wind direction 150 degrees; wind speed 4 metres per second; visibility 10 kilometres or more; and broken cloud at 600 metres.

* Fictitious location

Note.— In this example, the primary units “metre per second” and “metre” were used for wind speed and height of cloud base, respectively. However, in accordance with Annex 5, the corresponding non-SI alternative units “knot” and “foot” may be used instead.

Example A5-2. Cancellation of TAF

Cancellation of TAF for YUDO (Donlon/International):*

TAF AMD YUDO 161500Z 1606/162418 CNL

Meaning of the forecast:

Amended TAF for Donlon/International* issued on the 16th of the month at 1500 UTC cancelling the previously issued TAF valid from 060000 UTC to ~~24~~1800 UTC on the 16th of the month.

* Fictitious location

Example A5-3. GAMET area forecast

YUCC GAMET VALID 220600/221200 YUDO –
 YUCC AMSWELL FIR/2 BLW FL120
 SECN I
 SFC WSPD WIND: 10/12 ~~16~~ MPS 310/16MPS
 SFC VIS: 06/08 ~~3000 M BR N OF N51~~ 06/08 N OF N51 3000M BR
 SIGWX: 11/12 ISOL TS
 SIG CLD: 06/09 ~~OVC 800/1100 FT AGL N OF N51~~ N OF N51 OVC 800/1100FT AGL 10/12 ISOL TCU
~~1200/8000 FT 1200/8000FT AGL~~
 ICE: MOD FL050/080
 TURB: MOD ABV FL090
 SIGMETS APPLICABLE: 3, 5
 SECN II
 PSYS: 06 ~~L 1004 HPA N5130 E01000~~ N5130 E01000 L 1004HPA MOV NE 25 KT WKN
 WIND/T: ~~2000 FT 270/18 MPS PS03 5000 FT 250/20 MPS MS02 10000 FT 240/22 MPS MS11~~
 2000FT N5500 W01000 270/18MPS PS03 5000FT N5500 W01000 250/20MPS MS02 10000FT
 N5500 W01000 240/22MPS MS11
 CLD: BKN SC ~~2500/8000 FT 2500/8000FT AGL~~
 FZLVL: ~~3000 FT 3000FT AGL~~
 MNM QNH: ~~1004 HPA~~ 1004HPA
 SEA: T15 HGT ~~5 M~~ 5M
 VA: NIL

Meaning: An area forecast for low-level flights (GAMET) issued for sub-area two of the Amwell* flight information region (identified by YUCC Amwell area control centre) for below flight level 120 by the Donlon/International* aerodrome meteorological office (YUDO); the message is valid from 0600 UTC to 1200 UTC on the 22nd of the month.

Section I:
 surface wind speeds and direction: between 1000 UTC and 1200 UTC surface wind direction 310 degrees; wind speed 16 metres per second;
 surface visibility: between 0600 UTC and 0800 UTC north of 51 degrees north 3 000 metres ~~north of 51 degrees north~~-(due to mist);
 significant weather phenomena: between 1100 UTC and 1200 UTC isolated thunderstorms without hail;
 significant clouds: between 0600 UTC and 0900 UTC north of 51 degrees north overcast base 800, top 1 100 feet above ground level ~~north of 51 degrees north~~; between 1000 UTC and 1200 UTC isolated towering cumulus base 1 200, top 8 000 feet above ground level;
 icing: moderate between flight level 050 and 080;
 turbulence: moderate above flight level 090 (at least up to flight level 120);
 SIGMET messages: 3 and 5 applicable to the validity period and sub-area concerned.

Section II:
 pressure systems: at 0600 UTC low pressure of 1 004 hectopascals at 51.5 degrees north 10.0 degrees east, expected to move north-eastwards at 25 knots and to weaken;
 winds and temperatures: at 2 000 feet above ground level at 55 degrees north 10 degrees west wind direction 270 degrees; wind speed 18 metres per second, temperature plus 3 degrees Celsius; at 5 000 feet above ground level at 55 degrees north 10 degrees west wind direction 250 degrees; wind speed 20 metres per second, temperature minus 2 degrees Celsius; at 10 000 feet above ground level at 55 degrees north 10 degrees west wind direction 240 degrees; wind speed 22 metres per second, temperature minus 11 degrees Celsius;
 clouds: broken stratocumulus, base 2 500 feet, top 8 000 feet above ground level;
 freezing level: 3 000 feet above ground level;
 minimum QNH: 1 004 hectopascals;
 sea: surface temperature 15 degrees Celsius; and state of the sea 5 metres;
 volcanic ash: nil.

* Fictitious location

APPENDIX 6. TECHNICAL SPECIFICATIONS RELATED TO SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

(See Chapter 7 of this Annex.)

Note.— Data type designators to be used in abbreviated headings for SIGMET, AIRMET, tropical cyclone and volcanic ash advisory messages are given in WMO Publication No. 386, Manual on the Global Telecommunication System.

1. SPECIFICATIONS RELATED TO SIGMET INFORMATION

1.1 Format of SIGMET messages

1.1.1 The content and order of elements in a SIGMET message shall be in accordance with the template shown in Table-A6-1 A6-1A.

...

1.1.3 The sequence number referred to in the template in Table-A6-1 A6-1A shall correspond with the number of SIGMET messages issued for the flight information region since 0001 UTC on the day concerned. The meteorological watch offices whose area of responsibility encompasses more than one FIR and/or CTA shall issue separate SIGMET messages for each FIR and/or CTA within their area of responsibility.

1.1.4 In accordance with the template in Table-A6-1 A6-1A, only one of the following phenomena shall be included in a SIGMET message, using the abbreviations as indicated below:

...

1.1.6 **Recommendation.**— *Meteorological watch offices ~~in a position to do so~~ should issue SIGMET information in digital form, in addition to the issuance of this SIGMET information in abbreviated plain language in accordance with 1.1.1.*

...

1.1.9 **Recommendation.**— *SIGMET, when issued in graphical format, should be as specified in Appendix 1, including the use of applicable symbols and/or abbreviations.*

...

1.2 Dissemination of SIGMET messages

...

1.2.2 SIGMET messages shall be disseminated to international OPMET databanks and the centres designated by regional air navigation agreement for the operation of aeronautical fixed service ~~satellite distribution systems~~ Internet-based services, in accordance with regional air navigation agreement.

2. SPECIFICATIONS RELATED TO AIRMET INFORMATION

2.1 Format of AIRMET messages

2.1.1 The content and order of elements in an AIRMET message shall be in accordance with the template shown in Table ~~A6-1~~ A6-1A.

2.1.2 The sequence number referred to in the template in Table ~~A6-1~~ A6-1A shall correspond with the number of AIRMET messages issued for the flight information region since 0001 UTC on the day concerned. The meteorological watch offices whose area of responsibility encompasses more than one FIR and/or CTA shall issue separate AIRMET messages for each FIR and/or CTA within its area of responsibility.

...

2.1.4 In accordance with the template in Table ~~A6-1~~ A6-1A, only one of the following phenomena shall be included in an AIRMET message, using the abbreviations as indicated below:

At cruising levels below flight level 100 (or below flight level 150 in mountainous areas, or higher, where necessary):

- | | |
|---|--|
| — surface wind speed | |
| – widespread mean surface
wind speed above 15 m/s (30 kt) | SFC WSPD
(+ wind speed, <u>direction</u> and units) |
| — surface visibility | |
| – widespread areas affected
by reduction of visibility to less than
5 000 m, including the weather
phenomenon causing the reduction
of visibility | SFC VIS
(+ visibility)
(+ one of the following weather phenomena or
combinations thereof: BR, DS, DU, DZ, FC, FG,
FU, GR, GS, HZ, IC , PL, PO, RA, SA, SG, SN,
SQ, SS or VA) |

...

Insert new text as follows:

2.1.6 **Recommendation.**— *Meteorological offices should issue AIRMET information in digital form, in addition to the issuance of this AIRMET information in abbreviated plain language in accordance with 2.1.1.*

2.1.7 AIRMET if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).

2.1.8 AIRMET if disseminated in digital form shall be accompanied by the appropriate metadata.

Note.— Guidance on the information exchange model, XML/GML and the metadata profile is provided in the Manual on the Digital Exchange of Aeronautical Meteorological Information (Doc 10003).

End of new text.

2.2 Dissemination of AIRMET messages

...

2.2.2 **Recommendation.**— *AIRMET messages should be transmitted to international operational meteorological databanks and the centres designated by regional air navigation agreement for the operation of aeronautical fixed service—~~satellite distribution systems~~ Internet-based services, in accordance with regional air navigation agreement.*

...

5. SPECIFICATIONS RELATED TO AERODROME WARNINGS

5.1 Format and dissemination of aerodrome warnings

...

5.1.3 **Recommendation.**— *In accordance with the template in Table A6-2, aerodrome warnings should relate to the occurrence or expected occurrence of one or more of the following phenomena:*

...

— *tsunami*

...

Note.— Aerodrome warnings related to the occurrence or expected occurrence of tsunami are not required where a national public safety plan for tsunami is integrated with the “at risk” aerodrome concerned.

...

5.2 Quantitative criteria for aerodrome warnings

Recommendation.— *When quantitative criteria are necessary for the issue of aerodrome warnings covering, for example, the expected maximum wind speed or the expected total snowfall, the criteria used should be ~~established by agreement~~ as agreed between the aerodrome meteorological office and the users of the warnings concerned.*

...

6. SPECIFICATIONS RELATED TO WIND SHEAR WARNINGS

...

6.2 Format and dissemination of wind shear warnings and alerts

Note.— Information on wind shear is also to be included as supplementary information in local routine reports, ~~and~~ local special reports, ~~and~~ METAR and SPECI in accordance with the templates in Appendix 3, Tables A3-1 and A3-2.

...

Editorial note.— Delete Table A6-1 in its entirety.

Editorial note.— Insert the following new table.

(Tracked changes are used to show the changes from existing Table A6-1. The template to be used for special air-reports (uplink) is presented in Table A6-1B.)

Table A6-1A. Template for SIGMET and AIRMET messages and special air reports (uplink)

Key: M = inclusion mandatory, part of every message;
 C = inclusion conditional, included whenever applicable;
 = = a double line indicates that the text following it should be placed on the subsequent line.

Note 1.— The ranges and resolutions for the numerical elements included in SIGMET and AIRMET messages and in special air reports are shown in Table A6-4 of this appendix.

Note 2.— In accordance with 1.1.5 and 2.1.5, severe or moderate icing and severe or moderate turbulence (SEV ICE, MOD ICE, SEV TURB, MOD TURB) associated with thunderstorms, cumulonimbus clouds or tropical cyclones should not be included.

Element as specified in Chapter 5 and Appendix 6	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
Location indicator of FIR/CTA (M) ²¹	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET/AIRMET refers (M)	nnnn		YUCC ³² YUDD ³²	
Identification (M)	Message identification and sequence number ³³ (M)	SIGMET [n][n]n	AIRMET [n][n]n	SIGMET-5 AIRMET-A3 SIGMET 1 SIGMET 01 SIGMET A01	AIRMET-2 AIRMET 9 AIRMET 19 AIRMET B19
Validity period (M)	Day-time groups indicating the period of validity in UTC (M)	VALID nnnnnn/nnnnn		VALID 010000/010400 VALID 221215/221600 VALID 101520/101800 VALID 251600/252200 VALID 152000/160000 VALID 192300/200300	
Location indicator of MWO (M)	Location indicator of MWO originating the message with a separating hyphen (M)	nnnn-		YUDO ⁻³² YUSO ⁻³²	
Name of the FIR/CTA or aircraft identification (M)	Location indicator and name of the FIR/CTA ⁶⁴ for which the SIGMET/AIRMET is issued or aircraft radiotelephony call sign (M)	nnnn nnnnnnnnnn FIR/[UIR] or nnnn nnnnnnnnnn CTA	nnnn nnnnnnnnnn FIR/[n]	YUCC AMSWELL FIR ³² YUDD SHANLON FIR/[UIR] ³² YUDD SHANLON CTA ²	YUCC AMSWELL FIR/2 ³² YUDD SHANLON FIR ³²
IF THE SIGMET OR AIRMET MESSAGE IS TO BE CANCELLED, SEE DETAILS AT THE END OF THE TEMPLATE.					

Element as specified in Chapter 5 and Appendix 6	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
Phenomenon (M) ⁷⁵	Description of phenomenon causing the issuance of SIGMET/AIRMET (C)	OBSC ⁸⁶ TS[GR ⁹⁷] EMBD ⁴⁸⁸ TS[GR ⁷] FRQ ⁴⁴⁹ TS[GR ⁷] SQL ⁴²¹⁰ TS[GR ⁷] TC nnnnnnnnn PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB or TC NN ⁴³¹¹ PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB SEV TURB ⁴⁴² SEV ICE ⁴⁵¹³ SEV ICE (FZRA) ⁴⁵¹³ SEV MTW ⁴⁶¹⁴ HVY DS HVY SS [VA ERUPTION] [MT] [nnnnnnnnn] [PSN Nnn[nn] or Snn[nn] Ennn[nn] or Wnnn[nn]] VA CLD RDOACT CLD	SFC WSPD nn[n]MPS (or SFC WSPD nn[n]KT) SFC WIND nnn/nn[n]MPS (or SFC WIND nnn/nn[n]KT) SFC VIS nnnnM (nn) ⁴²¹⁵ ISOL ⁴⁸¹⁶ TS[GR ⁷] ⁹ OCNL ⁴⁹¹⁷ TS[GR ⁷] MT OBSC BKN CLD nnn/[ABV]nnnnM (or BKN CLD nnn/[ABV][n]nnnnFT) or BKN CLD SFC/[ABV]nnnnM (or BKN CLD SFC/[ABV][n]nnnnFT) OVC CLD nnn/[ABV]nnnnM (or OVC CLD nnn/[ABV][n]nnnnFT) or OVC CLD SFC/[ABV]nnnnM (or OVC CLD SFC/[ABV][n]nnnnFT) ISOL ⁴⁸¹⁶ CB ²⁰¹⁸ OCNL ⁴⁹¹⁷ CB ¹⁸ FRQ ⁴⁴⁹ CB ¹⁸ ISOL ⁴⁸¹⁶ TCU ²⁰¹⁸ OCNL ⁴⁹¹⁷ TCU ²⁰¹⁸ FRQ ⁴⁴⁹ TCU ¹⁸ MOD TURB ⁴⁴² MOD ICE ⁴⁵¹³ MOD MTW ⁴⁶¹⁴	OBSC TS OBSC TSGR EMBD TS EMBD TSGR FRQ TS FRQ TSGR SQL TS SQL TSGR TC GLORIA PSN N10 W060 CB TC NN PSN S2030 E06030 CB SEV TURB SEV ICE SEV ICE (FZRA) SEV MTW HVY DS HVY SS VA ERUPTION MT ASHVAL ² PSN S15 E073 VA CLD RDOACT CLD	SFC WIND 040/40MPS SFC WIND 310/20KT SFC VIS 1500M (BR) ISOL TS ISOL TSGR OCNL TS OCNL TSGR MT OBSC BKN CLD 120/900M (BKN CLD 400/3000FT) BKN CLD SFC/3000M BKN CLD SFC/ABV10000FT OVC CLD 270/ABV3000M (OVC CLD 900/ABV10000FT) OVC CLD SFC/3000M OVC CLD SFC/ABV10000FT ISOL CB OCNL CB FRQ CB ISOL TCU OCNL TCU FRQ TCU MOD TURB MOD ICE MOD MTW
Observed or forecast phenomenon (M)	Indication whether the information is observed and expected to continue, or forecast (M)	OBS [AT nnnnZ] or FCST [AT nnnnZ]	OBS OBS AT 1210Z FCST FCST AT 1815Z		
Location (C) ²⁴¹⁹	Location (referring to latitude and longitude (in degrees and minutes))	Nnn[nn] Wnnn[nn] or Nnn[nn] Ennn[nn] or Snn[nn] Wnnn[nn] or Snn[nn] Ennn[nn] or N OF Nnn[nn] or S OF Nnn[nn] or N OF Snn[nn] or S OF Snn[nn] or [AND] W OF Wnnn[nn] or E OF Wnnn[nn] or W OF Ennn[nn] or E OF Ennn[nn] or N OF Nnn[nn] or N OF Snn[nn] AND S OF Nnn[nn] or S OF Snn[nn] or W OF Wnnn[nn] or W OF Ennn[nn] AND E OF Wnnn[nn]	N48 E010 N2020 W07005 N2706 W07306 S60 W160 S0530 E16530 N OF N50 S OF N54N5430 N OF S10 S OF S4530 W OF W155 W OF E15540 E OF W45 E OF E09015 N OF N1515 AND W OF E13530 S OF N45 AND N OF N40 N OF LINE S2520 W11510 – S2520 W12010 SW OF LINE N50 W005 – N60 W020 SW OF LINE N50 W020 – N45 E010 AND NE OF LINE N45 W020 – N40 E010		

Element as specified in Chapter 5 and Appendix 6	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
		<p>or E OF Ennn[nn]</p> <p>or</p> <p>[N OF, NE OF, E OF, SE OF, S OF, SW OF, W OF, NW OF] [LINE] N OF LINE²³ or NE OF LINE²³ or E OF LINE²³ or SE OF LINE²³ or S OF LINE²³ or SW OF LINE²³ or W OF LINE²³ or NW OF LINE²³ Nnn[nn] or Snn[nn]</p> <p>Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]]</p> <p>[AND N OF LINE²³ or NE OF LINE²³ or E OF LINE²³ or SE OF LINE²³ or S OF LINE²³ or SW OF LINE²³ or W OF LINE²³ or NW OF LINE²³ Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]]</p> <p>or</p> <p>Wl^{223, 25} Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – [Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]]</p> <p>or</p> <p>APRX nnKM WID LINE²³ BTN (or nnNM WID LINE²³ BTN) Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]]</p> <p>or</p> <p>ENTIRE FIR/[UIR]²⁴</p> <p>or</p> <p>ENTIRE CTA²⁴</p> <p>or²¹</p> <p>WI nnnKM (or nnnNM) OF TC CENTRE</p>		<p>WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550</p> <p>APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010</p> <p>ENTIRE FIR</p> <p>ENTIRE FIR/UIR</p> <p>ENTIRE CTA</p> <p>WI 400KM OF TC CENTRE</p> <p>WI 250NM OF TC CENTRE</p>	
Level (C) ²⁴⁹	Flight level or altitude and extent (C) ²²	<p>[SFC]/FLnnn or [SFC]/nnnnM (or [SFC]/[n]nnnnFT) or FLnnn/nnn or TOP FLnnn or [TOP] ABV FLnnn or [nnnn]/nnnnM (or [[n]nnnn]/[n]nnnnFT) or [nnnnM]/FLnnn (or [[n]nnnnFT]/FLnnn)</p> <p>or²³</p> <p>CB TOP [ABV] FLnnn WI nnnKM OF CENTRE (or CB TOP [ABV] FLnnn WI nnnNM OF CENTRE) or CB TOP [BLW] FLnnn WI nnnKM OF CENTRE (or CB TOP [BLW] FLnnn WI nnnNM OF CENTRE)</p> <p>or²¹</p> <p>TOP [ABV or BLW] FLnnn</p> <p>or²⁴</p> <p>FLnnn/nnn [APRX nnnKM BY nnnKM] [nnKM WID LINE²⁵ BTN (nnNM WID LINE BTN)] [Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] (or FLnnn/nnn [APRX nnnNM BY nnnNM] [Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]])</p>		<p>FL180</p> <p>SFC/FL070</p> <p>SFC/3000M</p> <p>SFC/10000FT</p> <p>FL050/080</p> <p>TOP FL390</p> <p>ABV FL250</p> <p>TOP ABV FL100</p> <p>FL310/450</p> <p>3000M</p> <p>2000/3000M</p> <p>8000FT</p> <p>6000/12000FT</p> <p>2000M/FL150</p> <p>10000FT/FL250</p> <p>CB TOP FL500 WI 270KM OF CENTRE (CB TOP FL500 WI 150NM OF CENTRE)</p> <p>TOP FL500</p> <p>TOP ABV FL500</p> <p>TOP BLW FL450</p> <p>FL310/350 APRX 220KM BY 35KM</p> <p>FL390</p>	

Element as specified in Chapter 5 and Appendix 6	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
Movement or expected movement (C) ^{24,19, 26}	Movement or expected movement (direction and speed) with reference to one of the sixteen points of compass, or stationary (C)	MOV N [nnKMH] or MOV NNE [nnKMH] or MOV NE [nnKMH] or MOV ENE [nnKMH] or MOV E [nnKMH] or MOV ESE [nnKMH] or MOV SE [nnKMH] or MOV SSE [nnKMH] or MOV S [nnKMH] or MOV SSW [nnKMH] or MOV SW [nnKMH] or MOV WSW [nnKMH] or MOV W [nnKMH] or MOV WNW [nnKMH] or MOV NW [nnKMH] or MOV NNW [nnKMH] (or MOV N [nnKT] or MOV NNE [nnKT] or MOV NE [nnKT] or MOV ENE [nnKT] or MOV E [nnKT] or MOV ESE [nnKT] or MOV SE [nnKT] or MOV SSE [nnKT] or MOV S [nnKT] or MOV SSW [nnKT] or MOV SW [nnKT] or MOV WSW [nnKT] or MOV W [nnKT] or MOV WNW [nnKT] or MOV NW [nnKT] or MOV NNW [nnKT]) or STNR		MOV SE MOV NNW MOV E 40KMH (MOV E 20KT) MOV WSW 20KT STNR	
Changes in intensity (C) ^{24,19}	Expected changes in intensity (C)	INTSF or WKN or NC		INTSF WKN NC	
Forecast time (C) ²⁶	Indication of the forecast time of phenomenon	FCST AT nnnnZ	—	FCST AT 2200Z	—
Forecast position (C) ^{21, 22, 34, 19, 26, 28}	Forecast position of volcanic ash cloud or the centre of the TC or other hazardous phenomena ²⁸ phenomenon at the end of the validity period of the SIGMET message (C)	or²⁸ FCST nnnnZ Nnn[nn] Wnnn[nn] or Nnn[nn] Ennn[nn] or Snn[nn] Wnnn[nn] or Snn[nn] Ennn[nn] or N OF Nnn[nn] or S OF Nnn[nn] or N OF Snn[nn] or S OF Snn[nn] [AND] W OF Wnnn[nn] or E OF Wnnn[nn] or W OF Ennn[nn] or E OF Ennn[nn] or N OF Nnn[nn] or N OF Snn[nn] AND S OF Nnn[nn] or S OF Snn[nn] or W OF Wnnn[nn] or W OF Ennn[nn] AND E OF Wnnn[nn] or E OF Ennn[nn] or [N OF, NE OF, E OF, SE OF, S OF, SW OF, W OF, NW OF] [LINE] N OF LINE ²³ or NE OF LINE ²³ or E OF LINE ²³ or SE OF LINE ²³ or S OF LINE ²³ or SW OF LINE ²³ or W OF LINE ²³ or NW OF LINE ²³ Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]]	—	N30 W170 N OF N30 S OF S50 AND W OF E170 S OF N46 AND N OF N39 NE OF LINE N35 W020 – N45 W040 SW OF LINE N48 W020 – N43 E010 AND NE OF LINE N43 W020 – N38 E010 WI N20 W090 – N05 W090 – N10 W100 – N20 W100 – N20 W090 APRX 50KM WID LINE BTN N64 W017 – N57 W005 – N55 E010 – N55 E030 ENTIRE FIR ENTIRE FIR/UIR ENTIRE CTA TC CENTRE PSN N2740 W07345 NO VA EXP FCST 1700Z – VA – CLD APRX S15 E075 – S15 E081 – S17 E083 – S18 E079 – S15 E075 FCST 0500Z ENTIRE FIR	—

Element as specified in Chapter 5 and Appendix 6	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
		<p>[AND N OF LINE²³ or NE OF LINE²³ or E OF LINE²³ or SE OF LINE²³ or S OF LINE²³ or SW OF LINE²³ or W OF LINE²³ or NW OF LINE²³ Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]]</p> <p>or</p> <p>Wl^{23, 25} Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]</p> <p>or</p> <p>FCST nnnnZ VA CLD APRX nnKM WID LINE^{25,23} BTN (nnNM WID LINE²³ BTN) Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] [– Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]]</p> <p>[AND]²⁶</p> <p>or</p> <p>FCST nnnnZ ENTIRE FIR/[UIR]²⁴</p> <p>or</p> <p>FCST nnnnZ ENTIRE CTA²⁴</p> <p>or²¹</p> <p>FCST nnnnZ TC CENTRE PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]</p> <p>or²²</p> <p>FCST nnnnZ NO VA EXP</p>		<p>FCST 0500Z ENTIRE CTA</p> <p>FCST 0500Z NO VA EXP</p> <p>FCST 2200Z TC CENTRE N2740 W07345</p>	
Repetition of elements (C) ²⁴	Repetition of elements included in a SIGMET message for volcanic ash cloud or tropical cyclone	[AND] ²⁴	—	AND	—

OR

Cancellation of SIGMET/AIRMET (C) ³⁰²⁷	Cancellation of SIGMET/AIRMET referring to its identification	<p>CNL SIGMET [n][n]n nnnnnn/nnnnnn</p> <p>or²²</p> <p>CNL SIGMET [n][n]n nnnnnn/nnnnnn [VA MOV TO nnnn FIR]²⁴</p>	CNL AIRMET [n][n]n nnnnnn/nnnnnn	<p>CNL SIGMET 2 101200/101600³⁰</p> <p>CNL SIGMET 3A13 251030/251430 VA MOV TO YUDO FIR³⁰²</p>	CNL AIRMET 05 151520/151800 ³⁰
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Notes.—

1. — No wind and temperature to be uplinked to other aircraft in flight in accordance with 3.2.
- 2-1. See 4.1.
- 3-2. Fictitious location.
- 4-3. In accordance with 1.1.3 and 2.1.2.
5. — See 3-1.
- 6-4. See 2.1.3.
- 7-5. In accordance with 1.1.4 and 2.1.4.
- 8-6. In accordance with 4.2.1 a).
- 9-7. In accordance with 4.2.4.
- 10-8. In accordance with 4.2.1 b).
- 11-9. In accordance with 4.2.2.
- 12-10. In accordance with 4.2.3.
- 13-11. Used for unnamed tropical cyclones.
- 14-12. In accordance with 4.2.5 and 4.2.6.
- 15-13. In accordance with 4.2.7.
- 16-14. In accordance with 4.2.8.
- 17-15. In accordance with 2.1.4.
- 18-16. In accordance with 4.2.1 c).
- 19-17. In accordance with 4.2.1 d).
- 20-18. The use of cumulonimbus, ~~CB,~~ (CB) and towering cumulus, ~~TCU,~~ (TCU) is restricted to AIRMETs in accordance with 2.1.4.
- 21-19. In the case of ~~the same phenomenon~~ volcanic ash cloud or tropical cyclone covering more than one area within the FIR, these elements can be repeated, as necessary.
- 22-20. Only for SIGMET messages for volcanic ash cloud and tropical cyclones.
- 23-21. Only for SIGMET messages for tropical cyclones.
- 24-22. Only for SIGMET messages for volcanic ash.
- 25-23. A straight line is to be used between two points drawn on a map in the Mercator projection or a straight line between two points which crosses lines of longitude at a constant angle.
- 26-24. To be used for two volcanic ash clouds or two centres of tropical cyclones simultaneously affecting the FIR concerned.
- 27-25. The number of coordinates should be kept to a minimum and should not normally exceed seven.
- 28-26. ~~Optionally can be used in addition to Movement or Expected Movement. The elements 'Forecast Time' and 'Forecast Position' are not to be used in conjunction with the element 'Movement or Expected Movement'.~~
29. ~~To be used for hazardous phenomena other than volcanic ash cloud and tropical cyclones.~~
- 30-27. End of the message (as the SIGMET/AIRMET message is being cancelled).
- 31-28. The levels of the phenomena remain fixed throughout the forecast period.

— *Note.* — *In accordance with 1.1.5 and 2.1.5, severe or moderate icing and severe or moderate turbulence (SEV ICE, MOD ICE, SEV TURB, MOD TURB) associated with thunderstorms, cumulonimbus clouds or tropical cyclones should not be included.*

Editorial note.— Insert the following new table.

(Tracked changes are used to show the changes from existing Table A6-1. The template to be used for SIGMET and AIRMET messages is presented in Table A6-1A.)

Table A6-1B. Template for ~~SIGMET and AIRMET messages and~~ special air-reports (uplink)

Key: M = inclusion mandatory, part of every message;
 C = inclusion conditional, included whenever applicable;
 = = a double line indicates that the text following it should be placed on the subsequent line.

Note.— The ranges and resolutions for the numerical elements included in ~~SIGMET/AIRMET messages and~~ in special air-reports are shown in Table A6-4 of this appendix.

<i>Element as specified in Chapter 5 and Appendix 6</i>	<i>Detailed content</i>	<i>SPECIAL AIR-REPORT Template^{1,2}</i>	<i>Examples</i>
Identification (M)	Message identification and sequence number ⁴ (M)	ARS	ARS
Name of the FIR/CTA or aircraft identification (M)	Location indicator and name of the FIR/CTA ³ for which the SIGMET/AIRMET is issued or aircraft radiotelephony call sign (M)	nnnnnn	VA812 ³
Observed phenomenon (M) ⁷	Description of observed phenomenon causing the issuance of SIGMET/AIRMET (C) the special air-report ⁴	TS TSGR SEV TURB SEV ICE SEV MTW HVY SS VA CLD [FLnnn/nnn] VA [MT nnnnnnnnn] MOD TURB MOD ICE	TS TSGR SEV TURB SEV ICE SEV MTW HVY SS VA CLD VA VA MT ASHVAL ⁵ MOD TURB MOD ICE
Observed or forecast phenomenon Observation time (M)	Indication whether the information is observed and expected to continue, or forecast (M) Time of observation of observed phenomenon	OBS AT nnnnZ	OBS AT 1210Z
Location (C) ²⁴	Location (referring to latitude and longitude (in degrees and minutes)) of observed phenomenon	NnnnnWnnnnn or NnnnnEnnnnn or SnnnnWnnnnn or SnnnnEnnnnn	N2020W07005 S4812E01036
Level (C) ²⁴	Flight level or altitude and extent (C) ²² of observed phenomenon	FLnnn or FLnnn/nnn or nnnnM (or [n]nnnnFT)	FL390 FL180/210 3000M 12000FT

Notes.—

1. No wind and temperature to be uplinked to other aircraft in flight in accordance with 3.2.
2. See 4.13.1.
3. Fictitious call sign.
4. In the case of special air-report for volcanic ash cloud, the vertical extent (if observed) and name of the volcano (if known) can be used.
- 3-5. Fictitious location.
4. In accordance with 1.1.3 and 2.1.2.
5. See 3.1.
6. See 2.1.3.
7. In accordance with 1.1.4 and 2.1.4.
8. In accordance with 4.2.1 a).
9. In accordance with 4.2.4.
10. In accordance with 4.2.1 b).
11. In accordance with 4.2.2.
12. In accordance with 4.2.3.
13. Used for unnamed tropical cyclones.
14. In accordance with 4.2.5 and 4.2.6.
15. In accordance with 4.2.7.
16. In accordance with 4.2.8.
17. In accordance with 2.1.4.
18. In accordance with 4.2.1 c).
19. In accordance with 4.2.1 d).
20. The use of cumulonimbus, CB, and towering cumulus, TCU, is restricted to AIRMETs in accordance with 2.1.4.
21. In the case of the same phenomenon covering more than one area within the FIR, these elements can be repeated, as necessary.
22. Only for SIGMET messages for volcanic ash cloud and tropical cyclones.
23. Only for SIGMET messages for tropical cyclones.
24. Only for SIGMET messages for volcanic ash.
25. A straight line between two points drawn on a map in the Mercator projection or a straight line between two points which crosses lines of longitude at a constant angle.
26. To be used for two volcanic ash clouds or two centres of tropical cyclones simultaneously affecting the FIR concerned.
27. The number of coordinates should be kept to a minimum and should not normally exceed seven.
28. Optionally can be used in addition to Movement or Expected Movement.
29. To be used for hazardous phenomena other than volcanic ash cloud and tropical cyclones.
30. End of the message (as the SIGMET/AIRMET message is being cancelled).
31. The levels of the phenomena remain fixed throughout the forecast period.

— *Note.* — *In accordance with 1.1.5 and 2.1.5, severe or moderate icing and severe or moderate turbulence (SEV ICE, MOD ICE, SEV TURB, MOD TURB) associated with thunderstorms, cumulonimbus clouds or tropical cyclones should not be included.*

...

Example A6-1. SIGMET and AIRMET message and the corresponding cancellations

SIGMET

YUDD SIGMET 2 VALID 101200/101600 YUSO –
YUDD SHANLON FIR/UIR OBSC TS FCST
S OF N54 AND E OF W012 TOP FL390 MOV E **20KT**
WKN FCST 1600Z S OF N54 AND E OF W010

AIRMET

YUDD AIRMET 1 VALID 151520/151800 YUSO –
YUDD SHANLON FIR ISOL TS OBS
N OF S50 TOP ABV FL100 STNR WKN

Cancellation of SIGMET

YUDD SIGMET 3 VALID 101345/101600 YUSO –
YUDD SHANLON FIR/UIR CNL SIGMET 2
101200/101600

Cancellation of AIRMET

YUDD AIRMET 2 VALID 151650/151800 YUSO –
YUDD SHANLON FIR CNL AIRMET 1
151520/151800

Example A6-2. SIGMET message for tropical cyclone

YUCC SIGMET 3 VALID 251600/252200 YUDO –
 YUCC AMSWELL FIR TC GLORIA PSN N2706 W07306 CB OBS AT 1600Z N2706 W07306 CB WI
 250NM OF TC CENTRE TOP FL500 WI 150NM OF CENTRE MOV NW 10KT NC FCST AT 2200Z TC
 CENTRE PSN N2740 W07345

Meaning:

The third SIGMET message issued for the AMSWELL* flight information region (identified by YUCC Amswell area control centre) by the Donlon/International* meteorological watch office (YUDO) since 0001 UTC; the message is valid from 1600 UTC to 2200 UTC on the 25th of the month; tropical cyclone Gloria at 27 degrees 6 minutes north and 73 degrees 6 minutes west; cumulonimbus was observed at 1600 UTC at 27 degrees 6 minutes north and 73 degrees 6 minutes west with within 250 nautical miles of the centre of the tropical cyclone cumulonimbus with top at flight level 500; within 150 nautical miles of the centre; the tropical cyclone is expected to move northwestwards at 10 knots and not to undergo any no changes in intensity are expected; at 2200 UTC the forecast position of the centre of the tropical cyclone at 2200 UTC is expected forecast to be located at 27 degrees 40 minutes north and 73 degrees 45 minutes west.

* Fictitious location

Example A6-3. SIGMET message for volcanic ash

YUDD SIGMET 2 VALID 211100/211700 YUSO –
 YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN S1500 E07348 VA CLD OBS AT 1100Z
 APRX 220KM BY 35KM 50KM WID LINE BTN S1500 E07348 – S1530 E07642 FL310/450 MOV SE
 65KMH INTSF FCST AT 1700Z VA CLD APRX 50KM WID LINE BTN S1506 E07500 – S1518 E08112
 – S1712 E08330 – S1824 E07836

Meaning:

The second SIGMET message issued for the SHANLON* flight information region (identified by YUDD Shanlon area control centre/upper flight information region) by the Shanlon/International* meteorological watch office (YUSO) since 0001 UTC; the message is valid from 1100 UTC to 1700 UTC on the 21st of the month; volcanic ash eruption of Mount Ashval* located at 15 degrees south and 73 degrees 48 minutes east; volcanic ash cloud observed at 1100 UTC in an approximate area of 220 km by 35 km approximately 50km wide line between 15 degrees south and 73 degrees 48 minutes east, and 15 degrees 30 minutes south and 76 degrees 42 minutes east; between flight levels 310 and 450; the volcanic ash cloud is expected to move southeastwards at 65 kilometres per hour; intensifying at 1700 UTC the volcanic ash cloud is forecast to be located approximately in an area bounded by the following points: in an approximately 50km wide line between 15 degrees 6 minutes south and 75 degrees east, 15 degrees 18 minutes south and 81 degrees 12 minutes east, and 17 degrees 12 minutes south and 83 degrees 30 minutes east, and 18 degrees 24 minutes south and 78 degrees 36 minutes east.

* Fictitious location

Example A6-4. SIGMET message for radioactive cloud

YUCC SIGMET 2 VALID 201200/201600 YUDO –
 YUCC AMSWELL FIR RDOACT CLD OBS AT 1155Z WI S5000 W14000 – S5000 W13800 – S5200
 W13800 – S5200 W14000 – S5000 W14000 SFC/FL100 ~~STNR~~ WKN FCST AT 1600Z WI S5200 W14000
 – S5200 W13800 – S5300 W13800 – S5300 W14000 – S5200 W14000

Meaning:

The second SIGMET message issued for the AMSWELL* flight information region (identified by YUCC Amswell area control centre) by the Donlon/International* meteorological watch office (YUDO) since 0001 UTC; the message is valid from 1200 UTC to 1600 UTC on the 20th of the month; radioactive cloud was observed at 1155 UTC within an area bounded by 50 degrees 0 minutes south 140 degrees 0 minutes west to 50 degrees 0 minutes south 138 degrees 0 minutes west to 52 degrees 0 minutes south 138 degrees 0 minutes west to 52 degrees 0 minutes south 140 degrees 0 minutes west to 50 degrees 0 minutes south 140 degrees 0 minutes west and between the surface and flight level 100; the radioactive cloud is expected ~~to remain stationary and~~ to weaken in intensity; at 1600 UTC the radioactive cloud is forecast to be located within an area bounded by 52 degrees 0 minutes south 140 degrees 0 minutes west to 52 degrees 0 minutes south 138 degrees 0 minutes west to 53 degrees 0 minutes south 138 degrees 0 minutes west to 53 degrees 0 minutes south 140 degrees 0 minutes west to 52 degrees 0 minutes south 140 degrees 0 minutes west.

* Fictitious location

Example A6-5. SIGMET message for severe turbulence

YUCC SIGMET 5 VALID 221215/221600 YUDO –
 YUCC AMSWELL FIR SEV TURB OBS AT 1210Z N2020 W07005 FL250 ~~MOV E 40KMH WKN~~
 INTSF FCST ~~AT~~ 1600Z S OF N2020 ~~AND~~ E OF W06950

Meaning:

The fifth SIGMET message issued for the AMSWELL* flight information region (identified by YUCC Amswell area control centre) by the Donlon/International* meteorological watch office (YUDO) since 0001 UTC; the message is valid from 1215 UTC to 1600 UTC on the 22nd of the month; severe turbulence was observed at 1210 UTC 20 degrees 20 minutes north and 70 degrees 5 minutes west at flight level 250; the turbulence is expected to ~~move eastwards at 40 kilometres per hour and to weaken~~ ~~strengthen~~ in intensity; ~~forecast position~~ at 1600 UTC the severe turbulence is forecast to be located south of 20 degrees 20 minutes north and east of 69 degrees 50 minutes west.

* Fictitious location

...

APPENDIX 8. TECHNICAL SPECIFICATIONS RELATED TO SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

...

1. MEANS OF SUPPLY AND FORMAT OF METEOROLOGICAL INFORMATION

1.1 Meteorological information shall be supplied to operators and flight crew members by one or more of the following, as agreed between the meteorological authority and the operator concerned, and with the order shown below not implying priorities:

...

4. SPECIFICATIONS RELATED TO FLIGHT DOCUMENTATION

4.1 Presentation of information

...

4.1.2 **Recommendation.**— *The flight documentation related to concatenated route-specific upper wind and upper-air temperature forecasts should be provided when as agreed between the meteorological authority and the operator concerned.*

...

4.2 Charts in flight documentation

4.2.1 Characteristics of charts

4.2.1.1 **Recommendation.**— *Charts included in flight documentation should have a high standard of clarity and legibility and should have the following physical characteristics:*

- a) *for convenience, the largest size of charts should be about 42 × 30 cm (standard size A3) and the smallest size should be about 21 × 30 cm (standard size A4). The choice between these sizes should depend on the route lengths and the amount of detail that needs to be given in the charts as agreed between the meteorological authorities and the users concerned;*

...

5. SPECIFICATIONS RELATED TO AUTOMATED PRE-FLIGHT INFORMATION SYSTEMS FOR BRIEFING, CONSULTATION, FLIGHT PLANNING AND FLIGHT DOCUMENTATION

5.1 Access to the systems

...

5.2 Detailed specifications of the systems

Recommendation.— *Automated pre-flight information systems for the supply of meteorological information for self-briefing, pre-flight planning and flight documentation should:*

...

- c) *use access and interrogation procedures based on abbreviated plain language and, as appropriate, ICAO location indicators, and aeronautical meteorological code data-type designators prescribed by the WMO, or based on a menu-driven user interface, or other appropriate mechanisms as agreed between the meteorological authority and the operators concerned; and*

...

APPENDIX 9. TECHNICAL SPECIFICATIONS RELATED TO INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES AND AERONAUTICAL INFORMATION SERVICES

1. INFORMATION TO BE PROVIDED FOR AIR TRAFFIC SERVICES UNITS

1.1 List of information for the aerodrome control tower

...

- a) local routine reports, ~~and~~ local special reports, METAR, ~~and~~ SPECI, TAF, ~~and~~ trend forecasts and amendments thereto, for the aerodrome concerned;

...

1.2 List of information for the approach control unit

...

- a) local routine reports, ~~and~~ local special reports, METAR, ~~and~~ SPECI, TAF, ~~and~~ trend forecasts and amendments thereto, for the aerodrome(s) with which the approach control unit is concerned;

...

1.5 Format of information

...

1.5.1 **Recommendation.**— *Local routine reports, ~~and~~ local special reports, METAR, ~~and~~ SPECI, TAF, ~~and~~ trend forecasts, SIGMET and AIRMET information, upper wind and upper-air temperature forecasts and amendments thereto should be supplied to air traffic services units in the form in which they are prepared, disseminated to other aerodrome meteorological offices or meteorological watch offices, or received from other aerodrome meteorological offices or meteorological watch offices, unless otherwise agreed locally.*

1.5.2 **Recommendation.**— *When computer-processed upper-air data for grid points are made available to air traffic services units in digital form for use by air traffic services computers, the contents, format and transmission arrangements should be as agreed between the meteorological authority and the appropriate ATS authority concerned. The data should normally be supplied as soon as is practicable after the processing of the forecasts has been completed.*

...

APPENDIX 10. TECHNICAL SPECIFICATIONS RELATED TO REQUIREMENTS FOR AND USE OF COMMUNICATIONS

(See Chapter 11 of this Annex.)

1. SPECIFIC REQUIREMENTS FOR COMMUNICATIONS

1.1 Required transit times of meteorological information

Recommendation.— ~~Unless otherwise determined by regional air navigation agreement, AFTN messages and bulletins containing operational meteorological information should achieve transit times of less than the following:~~

SIGMET and AIRMET messages, volcanic ash and tropical cyclone advisory information and special air reports	5 minutes
Abbreviated plain language amendments to significant weather and upper air forecasts	5 minutes
Amended TAF and corrections to TAF	5 minutes
METAR	} 0-900 km (500 NM) — 5 minutes
Trend forecasts	
TAF	} more than 900 km (500 NM) — 10 minutes
SPECI	

AFTN 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.

1.2 Grid point data for ATS and operators

1.2.1 **Recommendation.**— ~~When upper-air data for grid points in digital form are made available for use by air traffic services computers, the transmission arrangements should be as agreed between the meteorological authority and the appropriate ATS authority~~ concerned.

1.2.2 **Recommendation.**— ~~When upper-air data for grid points in digital form are made available to operators for flight planning by computer, the transmission arrangements should be as agreed among between the world area forecast centre~~ WAFC ~~concerned, the meteorological authority and the operators concerned.~~

...

ATTACHMENT A. OPERATIONALLY DESIRABLE ACCURACY OF MEASUREMENT OR OBSERVATION

Note.— The guidance contained in this table relates to Chapter 2 — Supply, use, quality management and interpretation of meteorological information, in particular to 2.2.7, and Chapter 4 — Meteorological observations and reports, in particular to 4.1.9.

...

ATTACHMENT B. OPERATIONALLY DESIRABLE ACCURACY OF FORECASTS

Note 1.— The guidance contained in this table relates to Chapter 2 — Supply, use, quality management and interpretation of meteorological information, in particular to 2.2.8, and Chapter 6 — Forecasts, in particular to 6.1.1.

...

ATTACHMENT C. SELECTED CRITERIA APPLICABLE TO AERODROME REPORTS

(The guidance in this table relates to Chapter 4 and Appendix 3.)

	<i>Surface wind</i>				...
Specifications	Directional variations ³			Speed variations ³	
	≥ 60° and < 180°		≥ 180°	Exceeding the mean speed by ≥ 5 m/s (10 kt)	
	Mean speed				
	< 1.5 m/s (3 kt)	≥ 1.5 m/s (3 kt)			
Local routine and special report	2/10 min ⁷	2/10 min ⁷	2 min		10 min ⁸
	VRB + 2 extreme directions ⁸	mean + 2 extreme directions ⁸	VRB (no extremes) ⁸	Minimum and maximum speed	
METAR/SPECI	10 min	10 min	10 min	10 min ⁸	
	VRB (no extremes)	mean + 2 extreme directions	VRB (no extremes)	Maximum speed ⁸	
Relevant reporting scales for all messages	Direction in three figures rounded off to the nearest 10 degrees (degrees 1 – 4 down, degrees 5 – 9 up)			Speed in 1 m/s or 1 kt Speed < 0.5 m/s (1 kt) indicated as CALM	

...

— END —

AMENDMENT No. 77-B

TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

**METEOROLOGICAL SERVICE FOR
INTERNATIONAL AIR NAVIGATION**

ANNEX 3

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

The amendment to Annex 3 contained in this document was adopted by the Council of ICAO on **22 February 2016**. Such parts of this amendment as have not been disapproved by more than half of the total number of Contracting States on or before **11 July 2016** will become effective on that date and will become applicable on **5 November 2020** as specified in the Resolution of Adoption. (State letter AN 10/1.1-16/17 refers.)

FEBRUARY 2016

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AMENDMENT 77 TO THE INTERNATIONAL STANDARDS AND
RECOMMENDED PRACTICES**

ANNEX 3 — METEOROLOGICAL SERVICE FOR INTERNATIONAL AIR NAVIGATION

RESOLUTION OF ADOPTION

The Council

Acting in accordance with the Convention on International Civil Aviation, and particularly with the provisions of Articles 37, 54 and 90 thereof,

1. *Hereby adopts* on 22 February 2016 Amendment 77 to the International Standards and Recommended Practices contained in the document entitled *International Standards and Recommended Practices, Meteorological Service for International Air Navigation* which for convenience is designated Annex 3 to the Convention;
2. *Prescribes* 11 July 2016 as the date upon which the said amendment shall become effective, except for any part thereof in respect of which a majority of the Contracting States have registered their disapproval with the Council before that date;
3. *Resolves* that the said amendment or such parts thereof as have become effective shall become applicable on 10 November 2016¹;
4. *Requests the Secretary General:*
 - a) to notify each Contracting State immediately of the above action and immediately after 11 July 2016 of those parts of the amendment which have become effective;
 - b) to request each Contracting State:
 - 1) to notify the Organization (in accordance with the obligation imposed by Article 38 of the Convention) of the differences that will exist on 10 November 2016¹ between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 10 October 2016², and thereafter to notify the Organization of any further differences that arise;
 - 2) to notify the Organization before 10 October 2016² of the date or dates by which it will have complied with the provisions of the Standards in the Annex as hereby amended;
 - c) to invite each Contracting State to notify additionally any differences between its own practices and those established by the Recommended Practices, following the procedure specified in subparagraph b) above with respect to differences from Standards.

¹ 5 November 2020 for Chapter 5 paragraph 5.5; Appendix 3, paragraph 4.8.1.5; Table A3-2, Supplementary information (C), Trend forecast (O); and Table A3-5, State of the runway.

² 5 October 2020 for Chapter 5 paragraph 5.5; Appendix 3, paragraph 4.8.1.5; Table A3-2, Supplementary information (C), Trend forecast (O); and Table A3-5, State of the runway.

**NOTES ON THE PRESENTATION OF THE
AMENDMENT 77-B TO ANNEX 3**

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. New text to be inserted is highlighted with grey shading. new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

**TEXT TO AMENDMENT 77-B TO THE
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES
METEOROLOGICAL SERVICE
FOR INTERNATIONAL AIR NAVIGATION**

**ANNEX 3
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

...

CHAPTER 5. AIRCRAFT OBSERVATIONS AND REPORTS

...

5.5 Special aircraft observations

Special observations shall be made by all aircraft whenever the following conditions are encountered or observed:

...

h) pre-eruption volcanic activity or a volcanic eruption; or

i) runway braking action encountered is not as good as reported.

...

**APPENDIX 3. TECHNICAL SPECIFICATIONS RELATED TO
METEOROLOGICAL OBSERVATIONS AND REPORTS**

...

4. OBSERVING AND REPORTING OF METEOROLOGICAL ELEMENTS

...

4.8 Supplementary information

...

4.8.1.5 Recommendation.— *In METAR and SPECI, the following information should be included in the supplementary information, in accordance with regional air navigation agreement:*

a) information on sea-surface temperature, and the state of the sea or the significant wave height, from aeronautical meteorological stations established on offshore structures in support of

helicopter operations; ~~and should be included in the supplementary information, in accordance with regional air navigation agreement.~~

~~b) information on the state of the runway provided by the appropriate airport authority.~~

~~Note 1.— The state of the sea is specified in WMO Publication No. 306, the Manual on Codes (WMO No. 306), Volume I.1, Part A — Alphanumeric Codes, Code Table 3700.~~

~~Note 2.— The state of the runway is specified in WMO Publication No. 306, Manual on Codes, Volume I.1, Part A — Alphanumeric Codes, Code Tables 0366, 0519, 0919 and 1079.~~

...

Table A3-2. Template for METAR and SPECI

Key: M = inclusion mandatory, part of every message;
 C = inclusion conditional, dependent on meteorological conditions or method of observation;
 O = inclusion optional.

Note 1.— The ranges and resolutions for the numerical elements included in METAR and SPECI are shown in Table A3-5 of this appendix.

Note 2.— The explanations for the abbreviations can be found in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400)

Element as specified in Chapter 4	Detailed content	Template(s)		Examples	
...					
Supplementary information (C)	Recent weather (C) ^{2,9}	REFZDZ or REFZRA or REDZ or RE[SH]RA or RERASN or RE[SH]SN or RESG or RESHGR or RESHGS or REBLN or RESS or REDS or RETSRA or RETSSN or RETSGR or RETSGS or RETS or REFC or REVA or REPL or REUP ¹² or REFZUP ¹² or RETSUP ¹² or RESHUP ¹²		REFZRA RETSRA	
	Wind shear (C) ²	WS Rnn[L] or WS Rnn[C] or WS Rnn[R] or WS ALL RWY		WS R03 WS ALL RWY WS R18C	
	Sea-surface temperature and state of the sea or significant wave height (C) ¹⁵	W[M]nn/Sn or W[M]nn/Hn[n][n]		W15/S2 W12/H75	
	State of the runway (C) ¹⁶	Runway designator (M)	R nn[L]/ or Rnn[C]/ or Rnn[R]/		R/SNOCLO R99/421594 R/SNOCLO R14L/GLRD//
		Runway deposits (M)	n or /	CLRD//	
Extent of runway contamination (M)		n or /			
Depth of deposit (M)		nn or //			
Friction coefficient or braking action (M)	nn or //				
Trend forecast (O) ^{12,16}	Change indicator (M) ¹⁷	NOSIG	BECMG or TEMPO	NOSIG BECMG FEW020	
...					

Notes.—

...

15. To be included in accordance with 4.8.1.5 a).

16. ~~To be included in accordance with 4.8.1.5 b).~~

17-16. To be included in accordance with Chapter 6, 6.3.2.

18-17. Number of change indicators to be kept to a minimum in accordance with Appendix 5, 2.2.1, normally not exceeding three groups.

...

...

Table A3-5. Ranges and resolutions for the numerical elements included in METAR and SPECI

<i>Element as specified in Chapter 4</i>		<i>Range</i>	<i>Resolution</i>
...			
State of the runway	Runway designator: (no-units)	01—36; 88; 99	4
	Runway deposits: (no-units)	0—9	4
	Extent of runway contamination: (no-units)	1; 2; 5; 9	—
	Depth of deposit: (no-units)	00—90; 92—99	4
	Friction coefficient/braking action: (no-units)	00—95; 99	4
...			

— END —