

APPENDIX

NOTES ON THE PRESENTATION OF THE AMENDMENT 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 new text which is highlighted with grey shading new text to replace existing text

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

METEOROLOGICAL SERVICE FOR INTERNATIONAL AIR NAVIGATION

ANNEX 3

CHAPTER 1. DEFINITIONS

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Area of coverage (world area forecast system). A geographical area for which a regional area forecast centre supplies forecasts for flights departing from aerodromes in its service area.

Area of responsibility (world area forecast system). A geographical area for which a regional area forecast centre prepares significant weather forecasts.

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Regional area forecast centre (RAFC). A meteorological centre designated to prepare and supply significant weather forecasts and upper wind and temperature charts for flights departing from aerodromes within its service area and to supply grid point data in digital form for up to world-wide coverage.

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Service area (world area forecast system). A geographical area within which a regional **world** area forecast centre is responsible for **supplying issuing** area forecasts to meteorological authorities and other users.

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Volcanic ash advisory centre (VAAC). A meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, area control centres, flight information centres, world area forecast centres, ~~relevant regional area forecast centres~~ and international OPMET data banks regarding the lateral and vertical extent and forecast movement of volcanic ash in the atmosphere following volcanic eruptions.

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World area forecast centre (W AFC). A meteorological centre designated to prepare and **supply issue** significant weather forecasts and upper-air forecasts in digital and/or pictorial form on a global basis ~~to regional area forecast centres, and~~ direct to States by appropriate means as part of the aeronautical fixed service.

World area forecast system (WAFS). A world-wide system by which world ~~and regional~~ area forecast centres provide aeronautical meteorological en-route forecasts in uniform standardized formats.

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CHAPTER 3. WORLD AREA FORECAST SYSTEM AND METEOROLOGICAL OFFICES

3.1 Objectives of the world area forecast system

The objectives of the world area forecast system shall be:

- ~~— a) to supply meteorological offices with forecasts of en-route meteorological conditions concerning upper winds, upper-air temperatures, direction, speed and height of maximum wind, tropopause height and significant weather in pictorial and/or alphanumeric form suitable, as far as practicable, for direct use by operators, flight crew members, air traffic services units and other aeronautical users;~~
- ~~— b) to supply meteorological authorities and other users with **global** upper wind, upper-air temperature, direction, speed and height of maximum wind and tropopause height forecasts and forecasts of significant weather phenomena for grid points in digital form.~~

~~These~~ **This** objectives shall be achieved through a comprehensive, integrated, world-wide and, as far as practicable, uniform system, and in a cost-effective manner.

3.2 World area forecast centres

3.2.1 A Contracting State, having accepted the responsibility for providing a WAFC within the framework of the world area forecast system, shall arrange for that centre:

- a) to prepare global forecasts for grid points in digital form for all required levels and in a standard format; the forecasts shall comprise upper winds, upper-air temperatures, tropopause heights and maximum wind speed, direction and height;
- b) to prepare global forecasts of significant weather phenomena **in digital form**;
- c) to issue the forecasts referred to in a) and b) above in digital ~~and/or pictorial form~~ **to meteorological authorities and other users in its service area**; and
- d) to prepare and issue amendments to the forecasts;
- e) to receive information concerning the accidental release of radioactive materials into the atmosphere from its associated WMO regional specialized meteorological centre for the provision of transport model products for radiological environmental emergency response, in order to include the information in significant weather forecasts; and

- f) to establish and maintain contact with VAACs for the exchange of information on volcanic activity in order to co-ordinate the inclusion of information on volcanic eruptions in significant weather forecasts.

Note 1.— Criteria for the issuance of amendments to the forecasts are given in 3.2.11 and 3.2.12.

Note 2.— Specifications for the preparation of significant weather and upper-air prognostic charts are contained in the Appendix.

Note 3.— The WAFS service areas are given in the CNS part of the regional air navigation plans.

3.2.2 **Recommendation.**—In case of interruption of the operation of a WAFC, its functions ~~should~~ **shall** be carried out by the other WAFC.

3.2.3 **Recommendation.**—The forecasts of upper winds and upper-air temperatures, direction, speed and height of maximum winds and tropopause heights prepared four times daily by a WAFC ~~should~~ **shall** be valid for 6, 12, 18, 24, 30 and 36 hours after the time (0000, 0600, 1200 and 1800 UTC) of the synoptic data on which the forecasts were based and ~~should~~ **shall** be available for start of transmission in the above order as soon as technically feasible but not later than 6 hours after standard time of observation.

3.2.4 **Recommendation.**—Forecasts of significant weather phenomena prepared by WAFCs ~~should~~ **shall** be issued four times a day for fixed valid times of 0000, 0600, 1200 and 1800 UTC. The transmission of each forecast ~~should~~ **shall** be completed as soon as technically feasible but at least nine hours before its validity time when issued in chart form and at least twelve hours before its validity time when issued in the BUFR code form.

3.2.5 **Recommendation.**—~~When the forecasts~~ **Forecasts** of significant weather phenomena ~~are~~ **shall** be issued in binary code form, **using** the BUFR code ~~should be used~~ **form**.

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

3.2.6 **Recommendation.**—Forecasts of significant weather phenomena ~~should~~ **shall** include all the items listed in 9.6.1. ~~When the~~ **The** forecasts ~~are issued in chart form or in the BUFR code form, they should~~ **shall** be in agreement with the specifications in 3.3.7: **issued for the following flight levels:**

- a) flight levels 250 and 630; and
- b) flight levels 100 and 250 for limited geographical areas, as determined by regional air navigation agreement. If the average elevation of the topography of the area could extend a significant topographical effect to flight level 100, a higher level should be specified for the base of the charts, in consultation with the RAFC or WAFC concerned, and in accordance with regional air navigation agreement. [redline text taken from 3.3.7 of Amendment 72]

3.2.7 **Recommendation.**— *The grid point forecasts prepared by a WAFC should comprise:*

- a) wind and temperature data for flight levels 50 (850 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 240 (400 hPa), 300 (300 hPa), 340 (250 hPa), 390 (200 hPa) and 450 (150 hPa);
- b) tropopause height, and direction, speed and height of maximum wind;

- c) *wind and temperature data for flight levels 530 (100 hPa) and 600 (70 hPa) when and where required; and*
- d) *humidity data for flight levels 50 (850 hPa), 100 (700 hPa), 140 (600 hPa) and 180 (500 hPa).*

3.2.8 **Recommendation.**— *The grid point forecasts of upper winds and upper-air temperatures, direction, speed and height of maximum winds and tropopause heights should be prepared by a WAFC in a fixed grid with a horizontal resolution of 140 km.*

Note.— *140 km represents a distance of about 1.25° of latitude.*

3.2.9 WAFCs shall adopt uniform formats and codes for the supply of forecasts and amendments.

3.2.10 **Recommendation.**— *The grid point forecasts of upper winds, upper-air temperatures, direction, speed and height of maximum winds and tropopause heights ~~should~~ shall be issued by a WAFC in the GRIB code form.*

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

~~— 3.2.11 **Recommendation.**— *The upper wind and upper-air temperature forecasts in pictorial form should be issued for flight levels as determined by regional air navigation agreement.*~~

3.2.11 **Recommendation.**— *Amendments to upper wind and upper-air temperature forecasts should be issued in accordance with the following criteria:*

<i>Upper wind</i>	<i>Change in direction of 30° or more, provided the wind speed is 60 km/h (30 kt) or more before or after the change; change in speed of 40 km/h (20kt) or more.</i>
<i>Upper-air temperatures</i>	<i>Change of more than 5°C.</i>

3.2.12 **Recommendation.**— *WAFCs should apply the following criteria for the amendment of significant en-route weather forecasts:*

<i>Aircraft icing and turbulence</i>	<i>Newly expected occurrence; error in expected position of phenomena; intensity increasing; intensity decreasing from severe to light or nil, or from moderate to nil.</i>
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<i>Jet streams</i>	<i>Newly expected occurrence or disappearance; error in expected position > 400 km; error in speed > 20 per cent; error in core height >900 m (3000 ft).</i>
<i>Other significant en-route weather phenomena, and any new information concerning volcanic eruptions or the accidental release of radioactive materials into the atmosphere of significance to aircraft operations.</i>	<i>Newly expected occurrence; no longer expected.</i>

3.2.13 Recommendation.— *Amendments to the upper wind and upper-air temperature forecasts should be prepared in accordance with the criteria in 3.2.12 in the form of amended meteorological bulletins and abbreviated plain-language messages and should be issued with the minimum possible delay.*

Note.— *Guidance on the use of abbreviated plain language is given in Attachment A.*

3.2.14 Recommendation.— *Amendments to forecasts of significant weather phenomena should be issued with the minimum possible delay in accordance with the criteria in 3.2.13 and supplied in the form of abbreviated plain-language messages.*

Note.— *Guidance on the preparation of abbreviated plain-language significant weather forecast messages is given in Attachment A.*

Editorial Note: — Paragraphs 3.2.11 to 3.2.14 and Attachment A may become redundant depending on how the WAFCs propose to issue amendments.

3.3 Regional area forecast centres

Editorial Note: — *Delete Section 3.3 in toto.*

3.4 Meteorological offices

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3.4.5 The extent to which an aerodrome meteorological office prepares forecasts and/or makes use of products from WAFCS and/or RAFCs and other sources shall be determined by the meteorological authority concerned.

3.4.6 Meteorological offices using WAFS GRIB or BUFR data and/or WAFS forecast charts shall notify the WAFCS and RAFC concerned immediately if significant discrepancies in accordance with 3.2.12, and 3.2.13 and 3.3.10 are detected or reported in respect of WAFS data and products.

3.4.7 **Recommendation.**—Aerodrome meteorological offices ~~should~~ **shall** use as far as practicable output products of the world area forecast system in the preparation of flight documentation. **In order to ensure uniformity and standardization of flight documentation, the content and source of the WAFS forecasts shall not be amended.**

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3.5 Meteorological watch offices

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3.5.3 The extent to which a meteorological watch office makes use of products from WAFCS and/or RAFCs and other sources shall be determined by the meteorological authority concerned.

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3.6 Volcanic ash advisory centres

3.6.1 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:

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

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

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3.7 Tropical cyclone advisory centres

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

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- 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:

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- 3) world area forecast centres, ~~relevant regional area forecast centres~~ and international OPMET data banks, and centres designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution systems.

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CHAPTER 5. AIRCRAFT OBSERVATIONS AND REPORTS

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5.8 Exchange of air-reports

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

- a) routine and special air-reports by voice communications, the ATS units relay them without delay to their associated meteorological watch office;
- b) routine air-reports by data link communications, the ATS units relay them without delay to WAFCs and, as appropriate, to RAFCs;
- c) special air-reports by data link communications, the ATS units relay them without delay to their associated meteorological watch office; **and** WAFCs ~~and, as appropriate, to RAFCs.~~

5.8.2 The meteorological watch offices shall assemble the routine air-reports received by voice communications and shall disseminate them to WAFCs and, as appropriate, RAFCs, and other meteorological offices in accordance with regional air navigation agreement. The exchange of collectives on an hourly basis may be found desirable when reports are numerous.

5.8.3 The meteorological watch office shall transmit without delay the special air-reports received by voice communications to WAFCs and, as appropriate, RAFCs.

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5.8.6 Air-reports received at WAFCs and RAFCs shall be further disseminated as basic meteorological data.

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

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7.2 Format and exchange of SIGMET messages

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7.2.11 SIGMET messages shall be disseminated to meteorological watch offices, WAFCs and, as appropriate, RAFCs and to other meteorological offices, in accordance with regional air navigation agreement. SIGMET messages for volcanic ash shall also be disseminated to VAACs.

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CHAPTER 9. SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

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9.4 Flight documentation — general

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

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- g) *labels on the charts should be clear and simple and should present the name of the ~~regional~~ world area forecast centre, the type of chart, date and valid time and if necessary the types of units used in an unambiguous way.*

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9.4.6 **Recommendation.**— *The minimum number of charts for flights between flight level 250 and flight level 450 should include a high-level significant weather chart (flight level 250 to flight level 450) and a forecast 250 hPa wind and temperature chart. The actual charts provided for pre-flight and in-flight planning and for flight documentation should be as agreed between meteorological authorities and other users ~~and the appropriate regional area forecast centre(s) concerned within a service area.~~*

9.4.7 **Recommendation.**— *The set of charts to be provided under the area forecast system for flights below flight level 250 and for flights above flight level 450 including supersonic flights should be as agreed between user States and other users ~~and the regional area forecast centre concerned within a service area.~~*

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CHAPTER 11. REQUIREMENTS FOR AND USE OF COMMUNICATIONS

11.1 Requirements for communications

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11.1.3 Suitable telecommunications facilities shall be made available to permit world ~~and regional~~ area forecast centres to supply the required world area forecast system products to meteorological offices, meteorological authorities and other users.

11.1.4 **Recommendation.**— *The telecommunications facilities used for the supply of world area forecast system products should be:*

- *a) for world area forecast centres; the aeronautical fixed service; and*

~~— b) for regional area forecast centres, the aeronautical fixed service, except as otherwise determined by regional air navigation agreement.~~

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11.1.13 **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 the world ~~or~~ regional area forecast centre concerned, the meteorological authority and the operators.*

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**ATTACHMENT A. GUIDANCE ON AREA FORECASTS IN
ABBREVIATED PLAIN LANGUAGE**

(See 3.2.13, 3.2.14, 3.3.1 and 3.3.9 of this Annex)

**PART 1 — FORMAT FOR ABBREVIATED PLAIN-LANGUAGE SIGNIFICANT WEATHER
FORECAST
MESSAGES AND AMENDMENTS THERETO TO SERVE INTERNATIONAL CIVIL AVIATION
IN OPERATIONS ABOVE FLIGHT LEVEL 250**

1. Specifications

1.1 For the purpose of these instructions, “abbreviated plain language” refers to a language conveying to aeronautical personnel a directly intelligible meaning through the use of abbreviations (except signals of the Q code) approved by ICAO and numerical values of self-explanatory nature supplemented, if suitable ICAO-approved abbreviations are not available, by other words taken with their usual meaning in aviation.

Note.— ICAO-approved abbreviations are published in ICAO Doc 8400, Procedures for Air Navigation Services — ICAO Abbreviations and Codes. Signals of the Q code should not be used in abbreviated plain-language significant weather area forecast messages.

1.2 In abbreviated plain-language significant weather forecast messages, the term “CB” should be understood to include pertinent weather phenomena normally associated with cumulonimbus, namely thunderstorms, moderate or severe turbulence, moderate or severe icing, and hail.

1.3 An abbreviated plain-language significant weather forecast message should be consistent with the significant weather forecast chart from which it was derived.

1.4 The format should be as follows:

- a) World Meteorological Organization abbreviated heading.
- b) *Type of message*; applicable vertical range; valid time; area to which the forecast message relates. Describe the forecast area by reference to latitude, to longitude, to latitude/longitude coordinates, to major geographical features, or to any combination thereof. Describe, in the same manner, any part of the area for which a significant weather forecast cannot be given because of lack of data.
- c) *Synopsis*. Include descriptions of significant weather features, such as tropical cyclones, surface positions of frontal systems and well-defined convergence zones; their forecast positions; their speed and direction of movement; and intensification or weakening, if considered significant. Give forecast positions as in b). Describe direction of movement in terms of eight points of the compass related to true north; give speed of movement in kilometres per hour or knots.
- d) *Significant weather phenomena*. Describe areas as in b). Describe the amount of cumulonimbus as ISOL EMBD CB (individual embedded cumulonimbus with a maximum spatial coverage of cumulonimbus less than 50 per cent of the area affected, or forecast to be affected, by the phenomenon) or ISOL CB IN HAZE (individual cumulonimbus concealed in haze with a maximum spatial coverage less than 50 per cent of the area affected, or forecast to be affected, by the phenomenon); OCNL EMBD CB (well separated

embedded cumulonimbus with a maximum spatial coverage of cumulonimbus between 50 and 75 per cent of the area affected, or forecast to be affected, by the phenomenon) or OCNL CB IN HAZE (well separated cumulonimbus concealed in haze with a maximum spatial coverage between 50 and 75 per cent of the area affected, or forecast to be affected, by the phenomenon); or FRQ CB (cumulonimbus clouds with little or no separation with a maximum spatial coverage greater than 75 per cent of the area affected, or forecast to be affected, by the phenomenon). Describe cumulonimbus clouds contained in layers of other clouds as EMBD. Give bases and tops of significant weather phenomena as flight level (FL). If no significant weather is forecast, enter the term "SIGWX NIL".

Note.— Give bases of significant weather phenomena only if expected to be at or above the lowest level of the atmosphere for which the forecast is prepared. Similarly, give the tops of significant weather phenomena only if expected to be at or below the highest level of the atmosphere for which the forecast is prepared.

- e) *Turbulence.* This should include turbulence, other than that associated with cumulonimbus, if expected to be moderate or severe, and the intensity thereof. Describe areas as in b). Give bases and tops of phenomenon as FL. If no turbulence in this category is forecast, no entry for turbulence should be given.

Note.— See Note under 1.4 d) for similar application.

- f) *Volcanic eruptions.* Include information on the location of volcanic eruptions which are producing ash clouds of significance to aircraft operations, including those producing only steam, comprising: volcanic eruption symbol at the location of the volcano; and at the side of the chart, the volcanic eruption symbol, the name of the volcano, its international number, latitude/longitude, the date and time of first eruption, if known, together with a reminder to users that reference should be made to SIGMETs and NOTAMS or ASHTAMS issued for the area concerned.

- g) *Radioactive materials in the atmosphere.* Information on the location of an accidental release of radioactive materials into the atmosphere of significance to aircraft operations, comprising: the radioactivity symbol at the site of the accident and, at the side of the chart the radioactivity symbol, latitude/longitude of the site of the accident, date and time of accident and a reminder to users to check NOTAMS for the area concerned.

2. Examples

Examples of abbreviated plain-language significant weather messages are given below.

Example 1

FAPN13 KWBC 101200
 AREA FCST FL250 TO FL450 VALID 110000 FOR AREA 37N135E 48N108W 28N130W 28N158E 37N135E.
 SYNOPSIS. COLD FRONT 45N179W 33N179W MOV E 20 KT. COLD FRONT 43N152W 44N140W 35N131W
 29N134W MOV NE 15 KT INTSF.
 SIGWX NIL
 TURB. MOD CAT FL260 TO FL340 36N140E 36N150E 34N141E 36N140E. MOD CAT FL280 TO FL380 41N133W

45N125W 42N117W 40N120W 41N133W.

Example 2

FAEWI EJJ 101300

AREA FCST FL250 TO FL450 VALID 110000 FOR AREA 50N20W 50N20E 30N20E 30N20W 50N20W.

SYNOPSIS. NO MAJOR WX SYSTEM.

SIGWX NIL.

Example 3

FANT10 KWBC 101200

AREA FCST FL250 TO FL600 VALID 110000 FOR AREA 55N88W 50N42E 33N13E 27N59W 55N88W.

SYNOPSIS. WARM FRONT 42N84W 43N79W 39N62W MOV NE 30 KT. OCCLUDED FRONT 63N40W 60N25W 50N29W MOV E 35 KT. COLD FRONT 50N29W 40N43W 31N60W MOV SE 10 KT INTSF.

SIGWX AND ASSOCIATED CLD. ISOL EMBD CB TOPS FL340 55N20E 55N30E 46N34E 44N24E 55N20E.

TURB. MOD CAT FL250 TO FL340 46N41W 53N40W 56N28W 50N32W 46N41W. MOD CAT FL250 TO FL350 62N30W 67N13W 63N08W 61N20W 62N30W.

Example 4

FANT10 KWBC 101400 AMD

AMD AREA FCST FL250 TO FL600 VALID 110000 FOR AREA 55N88W 50N42E 33N13E 27N59W 55N88W.

SYNOPSIS. NO MAJOR WX SYSTEM.

SIGWX AND ASSOCIATED CLD. FRQ CB TOPS FL480 48N80W 46N65W 41N65W 45N79W 48N80W.

OTHER AMD NIL.

Example 5

FAXT1 KWBC 101200

AREA FCST FL250 TO FL600 VALID 110000 FOR AREA 50N160W 50N43W 20S43W 20S160W 50N160W. FCST NIL FOR AREA SOUTH OF EQUATOR DUE LACK OF DATA.

SYNOPSIS. WARM FRONT 41N85W 43N80W 39N70W 39N61W MOV NE 30 KT. COLD FRONT 41N85W 29N94W MOV SE 25 KT. STNR FRONT 40N43W 30N63W. COLD FRONT 49N132W 45N130W 40N133W 30N144W MOV NE 15 KT INTSF.

SIGWX NIL.

TURB. MOD CAT FL280 TO FL380 41N116W 44N120W 45N125W 43N130W 42N133W 41N130W 39N116W
 41N116W. MOD CAT FL280 TO FL380 44N105W 41N109W 39N105W 44N105W. MOD CAT FL240 TO FL350
 50N70W 50N81W 44N87W 42N85W 45N75W 48N70W 50N70W.

**PART 2 — FORMAT FOR ABBREVIATED PLAIN-LANGUAGE SIGNIFICANT WEATHER
 FORECAST MESSAGES
 AND AMENDMENTS THERETO TO SERVE INTERNATIONAL CIVIL AVIATION
 IN OPERATIONS BETWEEN FLIGHT LEVELS 100 AND 250**

1. Specifications

1.1 For the purpose of these instructions, “abbreviated plain language” refers to a language conveying to aeronautical personnel a directly intelligible meaning through the use of abbreviations (except signals of the Q code) approved by ICAO and numerical values of self-explanatory nature supplemented, if suitable ICAO-approved abbreviations are not available, by other words taken with their usual meaning in aviation.

Note.— ICAO-approved abbreviations are published in ICAO Doc 8400, Procedures for Air Navigation Services — ICAO Abbreviations and Codes. Signals of the Q code should not be used in abbreviated plain-language significant weather area forecast messages.

1.2 In abbreviated plain-language significant weather forecast messages, the term “CB” should be understood to include pertinent weather phenomena normally associated with cumulonimbus, namely thunderstorms, moderate or severe turbulence, moderate or severe icing, and hail.

1.3 An abbreviated plain-language significant weather forecast message should be consistent with the significant weather forecast chart from which it was derived.

1.4 The format should be as follows:

a) World Meteorological Organization abbreviated heading.

b) *Type of message; applicable vertical range; valid time; area to which the forecast message relates.* Describe the forecast area by reference to latitude, to longitude, to latitude/longitude coordinates, to major geographical features, or to any combination thereof. Describe, in the same manner, any part of the area for which a significant weather forecast cannot be given because of lack of data.

c) *Synopsis.* Include descriptions of significant weather features, such as tropical cyclones, surface positions of frontal systems and well-defined convergence zones; their forecast positions; their speed and direction of movement; and intensification or weakening, if considered significant. Give forecast positions as in b). Describe direction of movement in terms of eight points of the compass related to true north; give speed of movement in kilometres per hour or knots.

d) *Significant weather phenomena and associated clouds.* Describe areas as in b). Give cloud amounts, except for cumulonimbus clouds, in terms of FEW (1 to 2 oktas), SCT (3 to 4 oktas), BKN (5 to 7 oktas), or OVC (8 oktas). Describe the amount of cumulonimbus as ISOL EMBD CB (individual embedded

cumulonimbus with a maximum spatial coverage of cumulonimbus less than 50 per cent of the area affected, or forecast to be affected, by the phenomenon) or ISOL CB IN HAZE (individual cumulonimbus concealed in haze with a maximum spatial coverage less than 50 per cent of the area affected, or forecast to be affected, by the phenomenon); OCNL EMBD CB (well separated embedded cumulonimbus with a maximum spatial coverage of cumulonimbus between 50 and 75 per cent of the area affected, or forecast to be affected, by the phenomenon) or OCNL CB IN HAZE (well separated cumulonimbus concealed in haze with a maximum spatial coverage between 50 and 75 per cent of the area affected, or forecast to be affected, by the phenomenon); or FRQ CB (cumulonimbus clouds with little or no separation with a maximum spatial coverage greater than 75 per cent of the area affected, or forecast to be affected, by the phenomenon). Describe cumulonimbus clouds contained in layers of other clouds as EMBD. Give bases and tops of significant weather phenomena and associated clouds as flight level (FL). If no significant weather is forecast, enter the term “SIGWX NIL”.

- e) *Turbulence*. This should include turbulence, other than that associated with cumulonimbus, if expected to be moderate or severe, and the intensity thereof. Describe areas as in b). Give bases and tops of phenomenon as FL. If no turbulence in this category is forecast, no entry for turbulence should be given.
- f) *Icing*. This should include icing, other than that associated with cumulonimbus, if expected to be moderate or severe, and the intensity thereof. Should also include icing in area(s) of forecast, freezing precipitation. Describe areas as in b). Give bases and tops of phenomenon as FL. If aircraft icing, other than that associated with cumulonimbus, is not forecast, no entry for icing should be given.
- g) *Volcanic eruptions*. Include information on the location of volcanic eruptions which are producing ash clouds of significance to aircraft operations, including those producing only steam, comprising: volcanic eruption symbol at the location of the volcano; and at the side of the chart, the volcanic eruption symbol, the name of the volcano, its international number, latitude/longitude, the date and time of first eruption, if known, together with a reminder to users that reference should be made to SIGMETs and NOTAMs or ASHTAMs issued for the area concerned.
- h) *Radioactive materials in the atmosphere*. Information on the location of an accidental release of radioactive materials into the atmosphere of significance to aircraft operations, comprising: the radioactivity symbol at the site of the accident and, at the side of the chart the radioactivity symbol, latitude/longitude of the site of the accident, date and time of accident and a reminder to users to check NOTAMS for the area concerned.

Note.— Give bases of significant weather phenomena (and associated clouds, if any) only if expected to be at or above the lowest level of the atmosphere for which the forecast is prepared. Similarly, give the tops of significant weather phenomena (and associated clouds, if any) only if expected to be at or below the highest level of the atmosphere for which the forecast is prepared.

2. Examples

Examples of abbreviated plain-language significant weather messages are given below.

Example 1

FAPN16 KWBC 101200
AREA FCST FL100 TO FL250 VALID 110000 FOR AREA 37N135E 48N108W 28N130W 28N158E 37N135E.

SYNOPSIS. COLD FRONT 45N179W 33N179W MOV E 20 KT. COLD FRONT 43N152W 44N140W 35N131W 29N134W MOV NE 15 KT INTSF.

SIGWX NIL

ICE. MOD ICE INC FL100 TO FL180 42N140W 46N145W 47N138W 42N140W.

Example 2

FANT14 KWBC 101200

AREA FCST FL100 TO FL250 VALID 110000 FOR AREA 55N88W 50N42E 33N13E 27N59W 55N88W.

SYNOPSIS. WARM FRONT 42N84W 43N79W 39N62W MOV NE 30 KT. OCCLUDED FRONT 63N40W 60N25W 50N29W MOV E 35 KT. COLD FRONT 40N29W 40N43W 31N60W MOV SE 10 KT INTSF.

SIGWX AND ASSOCIATED CLD. ISOL EMBD CB 44N20E 55N30E 46N34E 44N24E 44N20E.

TURB. MOD CAT BASE FL240 47N41W 53N40W 56N28W 50N32W 47N41W. MOD CAT BASE FL250 62N30W 67N13W 63N08W 61N20W 62N30W.

ICE. MOD ICE INC FL100 TO FL130 55N03W 49N08W 43N00W 44N10E 50N14E 55N03E.

Example 3

FANT14 KWBC 101400 AMD

AMD AREA FCST FL100 TO FL250 VALID 110000 FOR AREA 55N88W 40N42E 33N13E 27N59W 55N88W.

SYNOPSIS. WARM FRONT 42N84W 43N79W 39N62W MOV NE 10 KT INTSF.

SIGWX AND ASSOCIATED CLD. FRQ CB 48N80W 46N65W 41N65W 45N79W 48N80W INTSF.

OTHER AMD NIL.

**PART 3 — FORMAT FOR MESSAGES CONTAINING ABBREVIATED PLAIN-LANGUAGE
AMENDMENTS
TO UPPER-AIR FORECASTS**

1. Specifications

1.1 For the purpose of these instructions, “abbreviated plain language” refers to a language conveying to aeronautical personnel a directly intelligible meaning through the use of abbreviations (except signals of the Q code) approved by ICAO and numerical values of self-explanatory nature supplemented, if suitable ICAO-approved abbreviations are not available, by other words taken with their usual meaning in aviation.

Note.— ICAO-approved abbreviations are published in ICAO Doc 8400, Procedures for Air Navigation Services — ICAO Abbreviations and Codes. Signals of the Q code should not be used in abbreviated plain-language messages issued as amendments to relevant upper-air wind and temperature forecasts.

1.2 Abbreviated plain-language amendments to upper-air forecasts should be understood to apply to all relevant forecasts prepared by world and regional area forecast centres for any specified area, level and valid

time(s). Such forecasts could include meteorological charts, grid point data in numerical form and grid point data in digital form.

1.3 The area and levels for which amendments to upper-air forecasts are to be issued should be described with regard to horizontal dimensions by applicable latitude/longitude coordinates and with regard to vertical dimensions by applicable ICAO flight levels related to standard constant pressure surfaces.

1.4 To minimize the possibility of misinterpretation of the amendments, the procedures given below should be followed:

- a) amendments should be issued in abbreviated plain language as an amended area forecast under a World Meteorological Organization abbreviated heading, using as date time group the standard time of observation in UTC on which the original forecast was based;
- b) the amendment criteria given by Annex 3, 3.2.11 should be followed;
- c) the valid time(s) to which an amendment is intended to apply should be given in terms of 12, 18, 24 and/or 30 hours following the standard time in UTC on which the original forecast was based;
- d) the area to which an amendment to be issued is intended to apply should be described as a four-sided polygon in terms of latitude/longitude intersections giving corner coordinates of the polygon. To minimize the risk of misinterpretation, the corner coordinates should be given in a clockwise or counter-clockwise sequence. Latitude should be given in whole degrees (two digits) followed by N (north) or S (south). Longitude should be given in whole degrees (three digits) followed by E (east) or W (west);
- e) the ICAO flight levels to which an amendment is intended to apply should be given in the text of the amendment messages;
- f) amendments to forecasts of wind speed should be given in terms of percentage increase, using three digits (010, 020, 030, 120 and so forth) preceded by PS (plus) or of percentage decrease (010, 020, 030 and so forth up to a maximum decrease of 099) preceded by MS (minus);
- g) amendments to forecasts of wind direction should be given in terms of clockwise or counter-clockwise rotation from the forecast being amended, using three digits (010, 020 and so forth up to 180) preceded by CW (for clockwise) or CC (for counter-clockwise); and
- h) amendments to upper-air temperature forecasts should be given in three digits as absolute increases or decreases, in degrees Celsius, preceded by PS (plus) or MS (minus).

Note.— No entry should be made for any feature for which an amendment is not being issued.

2. Examples

Examples of messages containing amendments to upper-air forecasts are given below.

Example 1

FXPA1 KWBC 241200 AMD

AMD AREA FCST

SPEED CHANGE PER CENT INCR (PS) OR DECR (MS).
DIRECTION CHANGE CLOCKWISE (CW) OR COUNTER-CLOCKWISE (CC).
TEMPERATURE CHANGE ABSOLUTE INCR (PS) OR DECR (MS).

AMEND WIND AND TEMPERATURE FORECAST IN AREA 38N160E 46N160E 47N178W 35N178W.
AMENDMENT VALID 18 HR 24 HR AND 30 HR AFTER 241200.
AMENDMENT FORFL250FL300FL340FL390
WIND SPEED/PER CENTPS035PS035PS035PS035
WIND DIRECTION/DEGCC020CC020CC020CC020
TEMPERATURE/DEG CPS005PS005PS005PS005

AMEND WIND AND TEMPERATURE FORECAST IN AREA 47N177W 40N161W 30N161W 35N177W.
AMENDMENT VALID 18 HR 24 HR AND 30 HR AFTER 241200.
AMENDMENT FORFL250FL300FL340FL390
WIND SPEED/PER CENTMS025MS040MS050MS040

Example 2

FXPA2 KWBC 241200 AMD
AMD AREA FCST

SPEED CHANGE PER CENT INCR (PS) OR DECR (MS).
DIRECTION CHANGE CLOCKWISE (CW) OR COUNTER-CLOCKWISE (CC).
TEMPERATURE CHANGE ABSOLUTE INCR (PS) OR DECR (MS).

AMEND WIND AND TEMPERATURE FORECAST IN AREA 33N143E 43N147E 45N159E 33N159E.
AMENDMENT VALID 18 HR AND 24 HR AFTER 241200.
AMENDMENT FORFL250FL300FL340FL390
WIND SPEED/PER CENTPS040PS050PS070PS050
WIND DIRECTION/DEGCW020CW020CW020CW020
TEMPERATURE/DEG CMS005MS008MS010MS008

— END —