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THE CIVIL AVIATION ACT
(CAP. 80)

REGULATIONS

(Made under section 4)

THE CIVIL AVIATION (METEOROLOGICAL SERVICE FOR INTERNATIONAL AIR
NAVIGATION) (AMENDMENT) REGULATIONS, 2023

Citation
GN. No.
59 of 2017

1. These Regulations may be cited as the Civil Aviation (Meteorological Service for International Air Navigation) (Amendment) Regulations, 2023 and shall be read as one with the Civil Aviation (Meteorological Service for International Air Navigation) Regulations, 2017 hereinafter referred to as the “principal Regulations”.

General amendment

2. The principal Regulations are amended generally by deleting the words “Meteorological Service for International Air Navigation” wherever they appear and substituting for them the words “Meteorological Service for Air Navigation”.

Amendment of
regulation 2

3. The principal Regulations are amended in regulation 2 by adding in their appropriate alphabetical order the following new definitions:
“Meteorological watch office (MWO)” means an

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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;

“Pre-eruption volcanic activity” means unusual and increasing volcanic activity which may presage a volcanic eruption;

“Space weather centre (SWXC)” means a centre designated to monitor and provide advisory information on space weather phenomena expected to affect high frequency radio communications, communications via satellite, GNSS-based navigation and surveillance systems or pose radiation risk to aircraft occupants;

“State volcano observatory” means 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 or flight information centre, meteorological watch office and volcanic ash advisory centre;

“World area forecast system (WAFS)” means a worldwide system by which world area forecast centres provide aeronautical meteorological en-route forecasts in uniform standardized format;

Amendment of
regulation 9

4. The principal Regulations are amended in regulation (9) by

(a) adding immediately after subregulation (4) the following new subregulation

“(5) Subject to subregulation (4), the stated requirements for supplied meteorological information shall be as specified in the First

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Schedule.”

(b) renumbering subregulations (5), (6), (7), (8), (9) and (10) as subregulations (6),(7),(8),(9)(10) and (11) respectively.

Amendment of
regulation 11

5. The principal Regulations are amended in regulation 11 by adding immediately after subregulation (2) the following new subregulation:
“(3) Subject to subregulation (2) the technical specification related to world area forecast system shall be as specified in Second Schedule.”

Addition of
regulation 15A

6. The principal Regulations are amended by adding immediately after regulation 15, the following new regulation:
“Space weather center shall monitor and provide advisory information on space weather phenomena in its area of responsibility by:

(a) monitoring relevant ground-based, airborne and space-based observations to detect, and predict when possible, the existence of space weather phenomena that have an impact in the following areas:

- (i) high frequency radio communications;
- (ii) communications via satellite;

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- (iii) Global Navigation Satellite Systems based navigation and surveillance; and
- (iv) radiation exposure at flight levels;
- (b) issuing advisory information regarding the extent, severity and duration of the space weather phenomena that have an impact referred to in paragraph (a);
- (c) supplying the advisory information referred to in paragraph (b) to:
 - (i) area control centres, flight information centres and aerodrome meteorological offices in its area of responsibility which may be affected;
 - (ii) other Space Weather Centres; and

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(iii) international
operation
meteorology
databanks,
international
notice to air
men offices
and
aeronautical
fixed service
internet-
based
services.

(2) Space Weather Centres shall maintain a 24-hour watch and in the event of interruption of the operation of the Center, its functions shall be carried out by another Space Weather Center as designated by the Service Provider State concerned.

(3) The service provider shall arrange to receive advisory information regarding the extent, severity and duration of the space weather phenomena that have an impact referred to in subregulation (1)".

Amendment of
regulation 16

6. The principal Regulations are amended in regulation 16 by

(a) adding new sub regulation immediately after sub regulation 10 as follows:

"(11) Subject to subregulation (10), meteorological technical specification for observations and reports shall be as specified in the Third Schedule."

(b) renumbering subregulation (11) as subregulation (12).

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Amendment of
regulation 25

7.-(1) The principal Regulations are amended by deleting regulation 25 and substituting for it the following:

“Aircraft 25.-(1) The routine for aircraft
observati observation shall be as follows:
on

- (a) routine aircraft observation during en-route and climb out phases of the flight; and
- (b) special and other non-routine aircraft observation during any phase of the flight.”

(2) Subject to subregulation (1), the technical specification for aircraft observation and reports shall be as specified in the Fourth Schedule.”.

Amendment of
regulation 33

8. The principal Regulations are amended in regulation 33 by adding immediately after subregulation (2) the following new subregulation:

“(3) The service provider shall issue meteorological forecast in accordance with the technical specification and detailed criteria specified in the Fifth Schedule.”.

Amendment of
regulation 38

9. The principal Regulations are amended in regulation 38 by-

- (a) adding immediately after subregulation (5) the following new subregulation:

“(6) The service provider shall issue SIGMET information in accordance with the technical specification and detailed criteria specified in the Sixth Schedule.”

- (b) renumbering subregulations (6) and (7) as subregulations (7) and (8) respectively.

Amendment of
regulation 41

10. The principal Regulations are amended in

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regulation 41(1) by adding immediately after paragraph (c) the following new paragraph:
“(d) collected, processed, stored and issued in accordance with the technical specification and detailed criteria specified in the Seventh Schedule”.

Amendment of
regulation 45

11. The principal Regulations are amended in regulation 45 by-
(a) adding immediately after sub regulation (2) the following new subregulation:
“(3) Subject to subregulation (2), the meteorological information shall be supplied in accordance with the technical specification and detailed criteria specified in the Eighth Schedule.”;
(b) renumbering subregulations (3) to (14) as subregulations (4) to (15) respectively.

Amendment of
regulation 52

12. The principal Regulations are amended in Regulation 52 by-
(a) designating the contents of regulation 52 as 52(1); and
(b) adding immediately after sub regulation (1) as designated, the following new sub regulation:
“(2) Subject to subregulation (1), the service provider shall provide service to operators and flight crew members in accordance with the technical specification and detailed criteria specified in the Ninth Schedule”.

Amendment of
regulation 53

13. The principal Regulations are amended in regulation 53 by adding immediately after subregulation (5) the following new subregulation”
“(6) The service provider shall provide and use communication services in accordance with the technical specification and detailed criteria specified in the Tenth Schedule.”

Addition of
Schedules

14. The principal Regulations are amended by adding immediately after regulation 71 the following Schedules:

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FIRST SCHEDULE.

(Made under regulation 9(5))

METEOROLOGICAL INFORMATION STATED REQUIREMENTS

PART A

OPERATIONALLY DESIRABLE ACCURACY OF MEASUREMENT OR OBSERVATION

*Element to be observed operationally desirable accuracy of measurement or observation**

Mean surface wind Speed: ± 0.5 m/s (1 kt) up to 5 m/s (10 kt) $\pm 10\%$ above 5 m/s (10 kt)	Direction: $\pm 10^\circ$
Variations from the mean surface wind longitudinal and lateral components	± 1 m/s (2 kt), in terms of
Visibility $\pm 10\%$ between 600 m and 1 500 m $\pm 20\%$ above 1 500 m	± 50 m up to 600m
Runway visual range ± 25 m between 400 m and 800 m $\pm 10\%$ above 800 m	± 10 m up to 400m
Cloud amount	± 1 okta
Cloud height (330ft) $\pm 10\%$ above 100 m (330 ft)	± 10 m (33 ft) up to 100 m
Air temperature and dew-point temperature $\pm 1^\circ\text{C}$	
Pressure value (QNH, QFE)	± 0.5 hPa

* The operationally desirable accuracy is not intended as an operational requirement; it is to be understood as a goal that has been expressed by the operators.

Note. — Guidance on the uncertainties of measurement or observation can be found in the Guide

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to Meteorological Instruments and Methods of Observation (WMO-No. 8).

PART B

OPERATIONALLY DESIRABLE ACCURACY OF FORECASTS

Note. — If the accuracy of the forecasts remains within the operationally desirable range shown in the second column, for the percentage of cases indicated in the third column, the effect of forecast errors is not considered serious in comparison with the effects of navigational errors and of other operational uncertainties.

Element to be forecast

Operationally desirable accuracy of forecasts

Minimum percentage of cases within range

TAF

Wind direction	±20°	80% of cases
Windspeed	± 2.5 m/s(5kt)	80% of cases
Visibility	± 200 m up to 800m	
± 30% between 800 m and 10 km		
80% of cases		
Precipitation	Occurrence or non-occurrence	80% of cases
Cloud amount	One category below 450 m (1 500ft)	
Occurrence or non-occurrence of BKN or OVC between 450 m (1 500 ft) and 3 000 m (10 000 ft)		
70% of cases		
Cloud height	± 30 m (100 ft) up to 300 m (1 000ft)	
± 30% between 300 m (1 000 ft) and 3 000 m (10 000 ft)		
70% of cases		
Air temperature	±1°C	70% of cases

TREND FORECAST

Wind direction	±20°	90% of cases
Windspeed	± 2.5 m/s(5kt)	90% of cases
Visibility	± 200 m up to 800m	
± 30% between 800 m and 10 km		
90% of cases		
Precipitation	Occurrence or non-occurrence	90% of cases

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Minimum percentage of cases within range

Cloud amount	One category below 450 m (1 500ft)
Occurrence or non-occurrence of BKN or OVC between 450 m (1 500 ft) and 3 000 m (10 000 ft)	
90% of cases	
Cloud height	± 30 m (100 ft) up to 300 m (1 000ft)
± 30% between 300 m (1 000 ft) and 3 000 m (10 000 ft)	
90% of cases	

Wind direction	$\pm 20^\circ$	90% of cases
Wind speed	± 2.5 m/s (5 kt) up to 12.5 m/s (25 kt)	90% of cases
Air temperature	$\pm 1^\circ\text{C}$	90% of cases
Pressure value (Q33P)	± 1 hPa	90% of cases

Relative humidity	±20%	90% of cases
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Upper wind $\pm 5 \text{ m/s (10kt)}$
 (Modulus of vector difference for 900 km (500 NM))
 Significant en-route
 weather phenomena and cloud
 Occurrence or non-occurrence Location: $\pm 100 \text{ km (60 NM)}$
 Vertical extent: $\pm 300 \text{ m (1 000 ft)}$
 Flight level of tropopause: $\pm 300 \text{ m (1 000 ft)}$ Max wind level: $\pm 300 \text{ m (1 000 ft)}$
 80% of cases
 70% of cases
 70% of cases
 80% of cases
 80% of cases

*Element to be observed operationally desirable accuracy of measurement or observation**

SECOND SCHEDULE

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(Made under regulation 11(3))

TECHNICAL SPECIFICATIONS RELATED TO GLOBAL SYSTEMS, SUPPORTING
CENTRES AND METEOROLOGICAL OFFICES

1. WORLD AREA FORECAST SYSTEM

1.1 Formats and codes

World area forecast centres (WAFCs) shall adopt uniform formats and codes for the supply of forecasts.

1.2 Upper-air gridded forecasts

1.2.1 The forecasts of upper winds; upper-air temperature; and humidity; direction, speed and flight level of maximum wind; flight level and temperature of tropopause, areas of cumulonimbus clouds, icing, clear-air and in-cloud turbulence, and geopotential altitude of flight levels shall be prepared four times a day by a WAFc and shall be valid for fixed valid times at 6, 9, 12, 15, 18, 21, 24, 27, 30, 33 and 36 hours after the time (0000, 0600, 1200 and 1800 UTC) of the synoptic data on which the forecasts were based. The dissemination of each forecast shall be in the above order and shall be completed as soon as technically feasible but not later than 6 hours after standard time of observation.

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 (225hPa), 390 (200hPa), 410 (175hPa), 450 (150hPa), 480 (125hPa) and 530(100hPa);
- (b) flight level and temperature of tropopause;
- (c) direction, speed and flight level of maximum wind;
- (d) humidity data for flight levels 50 (850hPa), 80 (750hPa), 100 (700hPa), 140 (600hPa) and 180 (500hPa);
- (e) horizontal extent and flight levels of base and top of cumulonimbus clouds;
- (f) icing for layers centred at flight levels 60 (800 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 240 (400 hPa) and 300 (300hPa);
- (g) clear-air turbulence for layers centred at flight levels 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 340 (250 hPa), 390 (200 hPa) and 450 (150hPa);
- (h) in-cloud turbulence for layers centred at flight levels 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 240 (400 hPa) and 300 (300 hPa); and

Note 1.— Layers centred at a flight level referred to in f) and h) have a depth of 100 hPa.

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Note 2. — Layers centred at a flight level referred to in g) have a depth of 50 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).

1.2.3 The foregoing grid point forecasts shall be issued by a WAFC in binary code form using the GRIB code form prescribed by the World Meteorological Organization (WMO).

Note.— The GRIB code form is contained in the Manual on Codes (WMO-No. 306), Volume I.2, Part B — Binary Codes.

1.2.4 The foregoing grid point forecasts shall be prepared by a WAFC in a regular grid with a horizontal resolution of 1.25° of latitude and longitude.

1.3 Significant weather (SIGWX) forecasts

1.3.1 General provisions

1.3.1.1 Forecasts of significant en-route weather phenomena shall be prepared as SIGWX forecasts four times a day by a WAFC and shall be valid for fixed valid times at 24 hours after the time (0000, 0600, 1200 and 1800 UTC) of the synoptic data on which the forecasts were based. The dissemination of each forecast shall be completed as soon as technically feasible but not later than 9 hours after standard time of observation.

1.3.1.2 SIGWX forecasts shall be issued in binary code form using the BUFR code form prescribed by WMO.

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

1.3.2 Types of SIGWX forecasts

SIGWX forecasts shall be issued as high-level SIGWX forecasts for flight levels between 250 and 630.

Note.— Medium-level SIGWX forecasts for flight levels between 100 and 250 for limited geographical areas will continue to be issued until such time that flight documentation to be generated from the gridded forecasts of cumulonimbus clouds, icing and turbulence fully meets user requirements.

1.3.3 Types of SIGWX forecasts

SIGWX forecasts shall include the following items:

(a) tropical cyclone provided that the maximum of the 10-minute mean surface wind speed is expected to reach or exceed 17 m/s (34kt);

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- (b) severe squall lines;
- (c) moderate or severe turbulence (in cloud or clear air);
- (d) moderate or severe icing;
- (e) widespread sandstorm/dust storm;
- (f) cumulonimbus clouds associated with thunderstorms and with a) toe);

Note.— Non-convective cloud areas associated with in-cloud moderate or severe turbulence and/or moderate or severe icing are to be included in the SIGWX forecasts.

- (g) flight level of tropopause;
- (h) jet streams;
- (i) information on the location of volcanic eruptions that are producing ash clouds of significance to aircraft operations, comprising: volcanic eruption symbol at the location of the volcano and, in a separate text box on the chart, the volcanic eruption symbol, the name of the volcano (if known) and the latitude/longitude of the eruption. In addition, the legend of SIGWX charts should indicate “CHECK SIGMET, ADVISORIES FOR TC AND VA, AND ASHTAM AND NOTAM FOR VA”; and
- (j) information on the location of a release of radioactive materials into the atmosphere of significance to aircraft operations, comprising: the radioactive materials in the atmosphere symbol at the location of the release and, in a separate text box on the chart, the radioactive materials in the atmosphere symbol, latitude/longitude of the site of the release, and (if known) the name of site of the radioactive source. In addition, the legend of SIGWX charts on which a release of radiation is indicated should contain “CHECK SIGMET AND NOTAM FOR RDOACTCLD”.

Note 1. — Medium-level SIGWX forecasts include all the items above.

Note 2.— Items to be included in low-level SIGWX forecasts (i.e., flight levels below 100) are included in Schedule 5.

1.3.4 Criteria for including items in SIGWX forecasts.

The following criteria shall be applied for SIGWX forecasts:

- (a) items a) to f) in 1.3.3 shall only be included if expected to occur between the lower and upper levels of the SIGWX forecast.
- (b) the abbreviation “CB” shall only be included when it refers to the occurrence or expected occurrence of cumulonimbus clouds:
 - 1) affecting an area with a maximum spatial coverage of 50 per cent or more of the area concerned.
 - 2) along a line with little or no space between individual clouds; or

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3) embedded in cloud layers or concealed by haze;

(c) the inclusion of "CB" shall be understood to include all weather phenomena normally associated with cumulonimbus clouds, i.e., thunderstorm, moderate or severe icing, moderate or severe turbulence and hail.

(d) where a volcanic eruption or a release of radioactive materials into the atmosphere warrants the inclusion of the volcanic eruption symbol or the radioactive materials in the atmosphere symbol in SIGWX forecasts, the symbols shall be included on SIGWX forecasts irrespective of the height to which the ash column or radioactive material is reported or expected to reach; and

(e) in the case of co-incident or the partial overlapping of items a), i) and j) in 1.3.3, the highest priority shall be given to item i), followed by items j) and a). The item with the highest priority shall be placed at the location of the event, and a narrow shall be used to link the location of the other item(s) to its associated symbol or textbox.

2. AERODROME METEOROLOGICAL OFFICES
(PART I) –

2.1 Use of world area forecast system (WAFS) products.

2.1.1 Aerodrome meteorological offices shall use WAFS forecasts issued by the WAFCs in the preparation of flight documentation, whenever these forecasts cover the intended flight path in respect of time, altitude and geographical extent, unless otherwise agreed between the meteorological authority and the operator concerned.

2.1.2 In order to ensure uniformity and standardization of flight documentation, the WAFS GRIB and BUFR data received shall be decoded into standard WAFS charts in accordance with relevant provisions in this Annex, and the meteorological content and identification of the originator of the WAFS forecasts shall not be amended.

2.2 Notification of WAFC concerning significant discrepancies

Aerodrome meteorological offices using WAFS BUFR data shall notify the WAFC concerned immediately if significant discrepancies are detected or reported in respect of WAFS SIGWX forecasts concerning:

(a) icing, turbulence, cumulonimbus clouds that are obscured, frequent, embedded or occurring at a squall line, and sandstorms/dust storms; and

(b) volcanic eruptions or a release of radioactive materials into the atmosphere, of significance to aircraft operations.

The WAFC receiving the message shall acknowledge its receipt to the originator, together with a brief comment on the report and any action taken, using the same means of communication employed by the originator.

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Note. — Guidance on reporting significant discrepancies is provided in the Manual of Aeronautical Meteorological Practice (Doc 8896).

3. VOLCANIC ASH ADVISORY CENTRES

3.1 Volcanic ash advisory information

3.1.1 The advisory information on volcanic ash issued in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature, shall be in accordance with the template shown in Table A2-1. When no approved ICAO abbreviations are available, English plain language text, to be kept to a minimum, shall be used.

3.1.2 As of 5 November 2020, volcanic ash advisory information shall be disseminated in IWXXM GML form in addition to the dissemination of this advisory information in accordance with 3.1.1.

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

4. STATE VOLCANOOBSERVATORIES (PART II)

4.1 Information from State volcano observatories

The information required to be sent by State volcano observatories to their associated area control centres (ACCs)/flight information centres (FICs), meteorological watch office (MWO) and VAAC shall comprise:

- (a) for significant pre-eruption volcanic activity: the date/time (UTC) of report; name and, if known, number of the volcano; location(latitude/longitude); and description of volcanic activity; and
- (b) for volcanic eruption: the date/time (UTC) of report and time of eruption (UTC) if different from time of report; name and, if known, number of the volcano; location (latitude/longitude); and description of the eruption including whether an ash column was ejected and, if so, an estimate of height of ash column and the extent of any visible volcanic ash cloud, during and following an eruption; and
- (c) for volcanic eruption cessation: the date/time (UTC) of report and time of eruption cessation (UTC); name and, if known, number of the volcano; and location(latitude/longitude).

Note 1. — Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.

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Note 2. — The State volcano observatories may use the Volcano Observatory Notice for Aviation (VONA) format to send information to 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 website.

5. TROPICAL CYCLONE ADVISORY CENTRES

5.1 Tropical cyclone advisory information

5.1.1 The advisory information on tropical cyclones shall be issued for tropical cyclones when the maximum of the 10-minute mean surface wind speed is expected to reach or exceed 17 m/s (34 kt) during the period covered by the advisory.

5.1.2 The advisory information on tropical cyclones disseminated in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature, shall be in accordance with the template shown in Table A2-2.

5.1.3 Tropical cyclone advisory centres shall disseminate tropical cyclone advisory information in IWXXM GML form in addition to the dissemination of this advisory information in abbreviated plain language in accordance with 5.1.2

5.1.4 The tropical cyclone advisory information listed in Table A2-2, when prepared in graphical format, shall be as specified in Schedule 1 and issued using the PNG format.

6. SPACE WEATHER CENTRES

6.1 Space weather advisory information

6.1.1 Advisory information on space weather shall be issued in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature, and shall be in accordance with the template shown in Table A2-3. When no approved ICAO abbreviations are available, English plain language text, to be kept to a minimum, shall be used.

6.1.2 Space weather advisory information shall be disseminated in IWXXM GML form, in addition to the dissemination of space weather advisory information in abbreviated plain language in accordance with 6.1.1.

6.1.3 Space weather advisory information shall be disseminated in IWXXM GML form, in addition to the dissemination of this advisory information in abbreviated plain language in accordance with 6.1.1.

6.1.4 One or more of the following space weather effects shall be included in the space weather advisory information, using their respective abbreviations as indicated below:

HF communications (propagation, absorption)	HF COM
Communications via satellite (propagation, absorption)	SATCOM
GNSS-based navigation and surveillance (degradation)	GNSS
radiation at flight levels (increased exposure)	RADIATION

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6.1.5 The following intensities shall be included in space weather advisory information, using their respective abbreviations as indicated below:

moderate	MOD
severe	SEV

6.1.6 Updated advisory information on space weather phenomena shall be issued as necessary but at least every six hours until such time as the space weather phenomena are no longer detected and/or are no longer expected to have an impact.

Table A2-1. Template for advisory message for volcanic ash

Key: M = inclusion mandatory, part of every message;

O = inclusion optional;

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 advisory messages for volcanic ash are shown in Appendix 6, Table A6-4.

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).

Note 3.— Inclusion of a “colon” after each element heading is mandatory.

Note 4.— The numbers 1 to 18 are included only for clarity and they are not part of the advisory message, as shown in the example.

Element		Detailed content	Template(s)	Examples
1	Identification of the type of message (M)	Type of message	VA ADVISORY	VA ADVISORY
2	Status indicator (C)1	Indicator of test or exercise	STATUS:TEST EXER	STATUS:TEST or STATUS: EXER
3	Time of origin (M)	Year, month, day, time in UTC	DTG: nnnnnnnn/nnnnZ	DTG: 20080 923/0130Z

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4	Name of VAAC (M)	Name of VAAC	VAAC: n nnnnnnnnnn	VAAC: TOK YO
5	Name of volcano (M)	Name and IAVCEI ¹ number of volcano	VOLCANO: n nnnnnnnnnnnnnnnnnn nnn[nnnnnn] or UNKNOWN or UNNAMED	VOLCANO: KAR YMSKY1000- 13VOLCANO: UNN AMED
6	Location of volcano (M)	Location of volcano in degrees and minutes	PSN: N nnnnorSnnnn Wnnnnnor Ennnnn or UNKNOWN	PSN: N5403 E15927 PSN: UNK
7	State or region (M)	State, or region if ash is not reported over a State	AREA: n nnnnnnnnnnnnnnnn	AREA: RUSS IA
8	Summit elevation (M)	Summit elevation in m (or ft)	SUMMIT ELEV: n nnnM (ornnnnnFT)	SUMMIT ELEV: 1536M
9	Advisory number (M)	Advisory number: year in full and message number (separate sequence for each volcano)	ADVISORYNR: n nnn/nnnn	ADVISORY NR: 2008/4
10	Information source (M)	Information source using free text	INFOSOURCE: F ree text up to 32characters	INFO SOURCE: MTSAT-1R KVERT KEMSD

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11	Colour code (O)	Aviation colour code	AVIATIONCOLOUR ED or ORANGE or YELLOW CODE: r GREEN or UNKNOWN or NOTGIVEN or NIL	AVIATION RED COLOUR CODE:
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Element	Detailed content	Template(s)	Examples
12	Eruption details (M)	ERUPTION DETAILS: Free text up to 64 characters or UNKNOWN	ERUPTI ON DETAIL S: 2008092 3/0000Z FL 300
13	Time of observation (or estimation) of ash (M)	Day and time (in UTC) OBS (or EST) VA DTG: nn/nnnnZ	OBS VA DTG: 23/0100 Z
14	Observed or estimated ash cloud (M)	Horizontal (in degrees and minutes) and vertical extent at the time of the observed or estimated ash if the base is the top of the or estimated ash	OBS VA CLD or EST VA CLD: TOP FLnnn or SFC/FLnnn or FLnnn/nnn [nnKM WID LINE2 BTN (nnNM WID LINE BTN)] Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn] Wnnn[nn]
			OBS VA CLD: FL250/3 00 N5400 E15930 – N5400 E16100 N5300 MOV SE 20KT SFC/FL2 00 N5130 N5130 N5230 N5230 E16130

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		Movement of the		<i>or</i> Ennn[nn][– Nnn[nn] <i>or</i> Snn[nn]		MOV SE 15KT
		observed <i>or</i>		Wnnn[nn]		
		ash cloud		<i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn]		TOP
				Wnnn[nn]		40KMH
				<i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn]		VA NOT
				Wnnn[nn]		EM
				<i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn]		WIND
				Wnnn[nn]		FL 050/0
				<i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn]		180/12M
				Wnnn[nn]		PS
				<i>or</i> Ennn[nn]] MOV N nnKMH (<i>or</i> KT) <i>or</i> MOV NE nnKMH (<i>or</i> KT) <i>or</i> MOV E nnKMH (<i>or</i> KT) <i>or</i> MOV SE nnKMH (<i>or</i> KT) <i>or</i> MOV S nnKMH (<i>or</i> KT) <i>or</i> MOV SW nnKMH (<i>or</i> KT) <i>or</i>		

15	Forecast height	Day and time (in UTC)	FCST VA CLD +6 HR:	nn/nnnnZ SFC <i>or</i> FLnnn/[FL]nnn [nnKM WID LINE ² BTN (nnNM WID LINE BTN)] Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i>	FCST VA CLD	23/0700Z
	and position	(6 hours from the			+6 HR:	FL250/35 0
	ash	of				N5130
	(+6 HR) (M)	estimation) of ash”				N5130 E16230 –
		given in Item 12);				N5330 E16230 –

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			Ennn[nn] – Nnn[nn] or Snn[nn]	N5330
	Forecast		Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn]	SFC/FL18
	position (in degrees		Wnnn[nn] or Ennn[nn] – Nnn[nn] or Snn[nn]	N4830 E16330 –
	and minutes) for each		Wnnn[nn] or Ennn[nn]] ³ or NO VA EXP or NOT AVBL or NOT PROVIDED	N4830 E16630 –
	cloud mass for that			N5130 E16630 –
	fixed valid			N5130
				NO VA
				NOT
				NOT PROVIDE D

<i>Element</i>	<i>Detailed</i>	<i>Template(s)</i>	<i>Examples</i>
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GN. No.352 (Contd.)

16	Forecast height and position of the ash clouds (+12 HR) (M)	Day and time (in UTC) (12 hours from the "Time of observation (or estimation) of ash" given in Item12); Forecast height and position (in degrees and minutes) for each cloud mass for that fixed valid time	FCST VA CLD +12 HR:	nn/nnnnZ SFC or FLnnn/[FL]nn n [nnKM WID LINE2 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	FCST VA CLD +12 HR:	23/1300Z SFC/FL270 N4830 E16130 – N4830 E16600 – N5300 E16600 – N5300 E16130 NO VA EXP NOT AVBL NOT PROVIDED
17	Forecast height and position of the ash clouds (+18 HR) (M)	Day and time (in UTC) (18 hours from the "Time of observation (or estimation) of ash" given in Item12); Forecast height and position (in degrees and minutes) for each cloud mass for that fixed valid time	FCST VA CLD +18 HR:	nn/nnnnZ SFC or FLnnn/[FL]nn n [nnKM WID LINE2 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	FCST VA CLD +18 HR:	23/1900Z NO VA EXP NOT AVBL NOT PROVIDED

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18	Remarks (M)	Remarks, as necessary	RMK: Free text up to 256 characters or NIL	RMK: LATEST REP FM KVERT (0120Z) INDICATES ERUPTION HAS CEASED. TWO DISPERSING VA CLD ARE EVIDENT
19	Next advisory (M)	Year, month, day and time in UTC	NXT ADVISORY: nnnnnnnn/nnn nZ or NO LATER THAN nnnnnnnn/nnn nZ or NO FURTHER ADVISORIES	NXT ADVISORY: 20080923/0730Z NO LATER THAN nnnnnnnn/nnn nZ NO FURTHER ADVISORIES

Notes.—

- Used only when the message issued to indicate that a test or an exercise is taking place. When the word "TEST" or the abbreviation "EXER" is included, the message may contain information that should not be used operationally or will otherwise end immediately after the word "TEST". *[Applicable 7 November 2019]*
- International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI).
- 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.
- Up to 4 selected layers.
- If ash reported (e.g., AIREP) but not identifiable from satellite data.

Example A2-1. Advisory message for volcanic ash

VA ADVISORY	
DTG:	20080923/0130Z
VAAC:	TOKYO
VOLCANO:	KARYMSKY 1000-13
PSN:	N5403 E15927
AREA:	RUSSIA
SUMMIT ELEV:	1536M
ADVISORY NR:	2008/4
INFO SOURCE:	MTSAT-1R KVERT KEMSD

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(Amendment)*

GN. No.352 (Contd.)

AVIATION COLOUR CODE:	RED
ERUPTION DETAILS:	ERUPTION AT 20080923/0000Z FL300 REPORTED 23/0100Z
OBS VA DTG:	FL250/300 N5400 E15930 – N5400 E16100 – N5300
OBS VA CLD:	E15945 MOV SE 20KT SFC/FL200 N5130 E16130 – N5130 E16230 – N5230 E16230 – N5230 E16130 MOV SE 15KT
FCST VA CLD +6 HR:	23/0700Z FL250/350 N5130 E16030 – N5130 E16230 – N5330 E16230 – N5330 E16030 SFC/FL180 N4830
FCST VA CLD +12 HR:	E16330 – N4830 E16630 – N5130 E16630 – N5130 E16330
FCST VA CLD +18 HR:	23/1300Z SFC/FL270 N4830 E16130 – N4830 E16600 – N5300 E16600 – N5300 E16130
RMK:	23/1900Z NO VA EXP
NXT ADVISORY:	LATEST REP FM KVERT (0120Z) INDICATES ERUPTION HAS CEASED. TWO DISPERSING VA CLD ARE EVIDENT ON SATELLITE IMAGERY
	20080923/0730Z

Table A2-2. Template for advisory message for tropical cyclones

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 advisory messages for tropical cyclones are shown in Appendix 6, Table A6-4.

Note 2.— The explanations for the abbreviations can be found in the PANS-ABC (Doc 8400).
Note

Note 3.— Inclusion of a “colon” after each element heading is mandatory.

Note 4.— The numbers 1 to 21 are included only for clarity and they are not part of the advisory message, as shown in the example.

<i>Element</i>	<i>Detailed content</i>	<i>Template(s)</i>	<i>Examples</i>

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GN. No.352 (Contd.)

1	Identification of the type of message(M)	Type of message	TC ADVISORY	TC ADVISORY
2	Status indicator (C)1	Indicator of test or exercise	STAT TEST or US: EXER	STATU TEST S: EXER STATU S:
3	Time of origin(M)	Year, month, day and time in UTC of issue	DTG: nnnnnnnn/nnn nZ	DTG: 20040925/1600Z
4	Name of TCAC(M)	Name of TCAC (location indicator <i>or</i> full name)	TCAC: nnnn <i>or</i> nnnnnnnnnn	TCAC: YUFO1 TCAC: MIAMI
5	Name of tropical cyclone(M)	Name of tropical cyclone <i>or</i> "NN" for unnamed tropical cyclone	TC: nnnnnnnnnnn <i>or</i> NN	TC: GLORIA
6	Advisory number(M)	Advisory number. Year in full and message number (separate sequence for each cyclone)	ADVIS nnnn/[n][n]nn ORYN R:	ADVIS 2004/13 ORY NR:
7	Observed position of the centre (M)	Day and time in UTC and position of the centre of the tropical cyclone (in degrees and minutes)	OBS nn/nnnnZ PSN: Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn]	OBS 25/1800Z PSN N2706 W07306

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GN. No.352 (Contd.)

8	Observed CB cloud (C))	Location of CB cloud (referring to latitude and longitude (in degrees and minutes)) and vertical extent (flight level	CB:	WI nnnKM (or nnnNM) OF TC CENTRE or WI4 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]] and TOP [ABV or BLW] FLnnn(<i>or</i> KT) <i>or</i> ESE nnKMH (<i>or</i> KT) <i>or</i> SE nnKMH (<i>or</i> KT) <i>or</i> SSE nnKMH (<i>or</i> KT) <i>or</i> S nnKMH (<i>or</i> KT) <i>or</i> SSW nnKMH (<i>or</i> KT) <i>or</i> SW nnKMH (<i>or</i> KT) <i>or</i> WSW nnKMH (<i>or</i> KT) <i>or</i> W nnKMH (<i>or</i> KT) <i>or</i> WNW nnKMH (<i>or</i> KT) <i>or</i> NW nnKMH (<i>or</i> KT) <i>or</i> NNW nnKMH (<i>or</i> KT) <i>or</i> SLW <i>or</i> STNR	CB:	WI 250NM OF TC CENTRE TOP FL500
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Civil Aviation (Meteorological Service For International Air Navigation)
(Amendment)

GN. No.352 (Contd.)

10	Central pressure (M)	Central pressure (in hPa)	C: nnnHPA	C:	965HPA
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Element		Detailed content	Template(s)		Examples	
11	Maximum surface wind(M)	Maximum surface wind near the centre (mean over 10 minutes, in m/s (or kt))	MAX WIND:	nn[n]MPS (or nn[n]KT)	MAX WIND:	22MPS
12	Forecast of centre position (+6 HR) (M)	Day and time (in UTC)	FCST PSN +6 HR:	nn/nnnnZ	FCST PSN +6 HR:	25/2200 Z
		(6 hours from the "DTG"		Nnn[nn] or Snn[nn] Wnnn[nn] or		N2748 W07350
	Forecast of centre position	given in Item 2)		Ennn[nn]		
		Forecast degrees and minutes) of				
		the centre of the tropical cyclone				
13	Forecast of maximum (M) surface wind (+6 HR)	Forecast of maximum surface wind (6 hours after the "DTG" given in Item 2)	FCST MAX WIND +6 HR:	nn[n]MPS (or nn[n]KT)	FCST MAX WIND +6 HR:	22MPS
14	Forecast of centre position	Day and time (in UTC)	FCST PSN +12 HR:	nn/nnnnZ	FCST PSN +12 HR:	26/0400 Z
		(12 hours		Nnn[nn] or		N2830

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	(+12 HR)(M)	“DTG” given in Item 2);		Ennn[nn]		
		Forecast degrees and the centre of cyclone				
15	Forecast of maximum surface wind (+12 HR)(M)	Forecast of maximum surface wind (12 hours after the “DTG” given in Item 2)	FCST MAX WIND +12 HR:	nn[n]MPS (or nn[n]KT)	FCST MAX WIND +12 HR:	22MPS
16	Forecast of centre position	Day and time (in UTC) (18 hours from the	FCST PSN +18 HR:	nn/nnnnZ Nnn[nn] or Snn[nn] Wnnn[nn] or	FCST PSN +18 HR:	26/1000 Z N2852 W07500
	(+18 HR)(M)	“DTG” given in Item 2);		Ennn[nn]		
		Forecast position (in				
		degrees and the centre of the tropical				
		cyclone				
17	Forecast of maximum surface wind (+18 HR)(M)	Forecast of maximum surface wind (18 hours after the “DTG” given in Item 2)	FCST MAX WIND +18 HR:	nn[n]MPS (or nn[n]KT)	FCST MAX WIND +18 HR:	21MPS
18	Forecast of	Day and time	FCST	nn/nnnnZ	FCST PSN	26/1600

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	position (+24 HR)(M)	(24 hours “DTG” given in Item 2). Forecast degrees and the centre of cyclone	Nnn[nn] or Ennn[nn]		N2912
19	Forecast of maximum surface wind (+24 HR)(M)	Forecast of maximum surface wind (24 hours after the “DTG” given in Item 2)	FCST MAX WIND +24 HR: nn[n]MPS (or nn[n]KT)	FCST MAX WIND +24 HR:	20MPS
20	Remarks(M)	Remarks, as necessary	RMK: <i>Free text up to 256 characters or NIL</i>	RMK:	NIL
21	Expected time of issuance of next advisory (M)	Expected year, month, day and time (in UTC) of issuance of next advisory	NXT MSG: <i>[BFR] nnnnnnnn/nnnnZ or NO MSG EXP</i>	NXT MSG:	2004092 5/2000Z

Notes. —

1. Used only when the message issued to indicate that a test or an exercise is taking place. When the word “TEST” or the abbreviation “EXER” is included, the message may contain information that should not be used operationally or will otherwise end immediately after the word “TEST”.
[Applicable 7 November 2019]
2. Fictitious location.
3. In the case of CB clouds associated with a tropical cyclone covering more than one area within the area of responsibility, this element can be repeated, as necessary.
4. The number of coordinates should be kept to a minimum and should not normally exceed seven

ExampleA2-2.

Advisory message for tropical cyclones

TC ADVISORY DTG: TCAC: TC: ADVISORY NR: OBS PSN: CB:	20040925/1900Z YUFO* GLORIA 2004/13 25/1800Z N2706 W07306 WI 250NM OF TC CENTRE TOP FL500
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Civil Aviation (Meteorological Service For International Air Navigation)
(Amendment)

GN. No.352 (Contd.)

MOV:	NW 20KMH
C:	965HPA
MAX WIND:	22MPS
FCST PSN +6 HR:	25/2200Z N2748 W07350
FCST MAX WIND +6 HR:	22MPS
FCST PSN +12 HR:	26/0400Z N2830 W07430
FCST MAX WIND +12 HR:	22MPS
FCST PSN +18 HR:	26/1000Z N2852 W07500
FCST MAX WIND +18 HR:	21MPS
FCST PSN +24 HR:	26/1600Z N2912 W07530
FCST MAX WIND +24 HR:	20MPS
RMK:	NIL
NXT MSG:	20040925/2000Z
*Fictitious location	

Table A2-3. Template for advisory message for space weather information

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 explanations for the abbreviations can be found in the PANS-ABC (Doc 8400).

Note 2.— The spatial resolutions are shown in Attachment E.

Note 3.— Inclusion of a colon after each element heading is mandatory.

Note 4.— The numbers 1 to 14 are included only for clarity and are not part of the advisory message, as shown in the examples.

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	<i>Element</i>	<i>Detailed</i>	<i>Template(s)</i>	<i>Examples</i>	
1	Identification of the type of message (M)	Type of message	<i>SWX ADVISORY</i>	<i>SWX ADVISORY</i>	
2	Status indicator (C)1	Indicator of test or exercise	<i>STATUS: TEST or EXER</i>	<i>STATUS:</i>	<i>TEST EXER</i>
3	Time of origin (M)	Year, month, day and time in UTC	<i>DTG: nnnnnnnn/nnnnZ</i>	<i>DTG:</i>	<i>20161108/0100Z</i>
4	Name of SWXC (M)	Name of SWXC	<i>SWXC:Nnnnnnnn nnnn</i>	<i>SWXC:</i>	<i>DONLON2</i>
5	Advisory number (M)	Year in full and unique message number	<i>ADVISORY NR: nnnn/[n]/[n]/n</i>	<i>ADVISORY NR:</i>	<i>2016/1</i>
6	Number of advisory being replaced (C)	Number of the previously issued advisory being replaced	<i>NR RPLC:nnnn/[n]/[n]/n</i>	<i>NR RPLC:</i>	<i>2016/1</i>
7	Space weather effect and intensity (M)	Effect and intensity of the space weather phenomena	<i>HF COM MOD SEV or SATCOM MOD SEV or GNSS MOD or HF COM MOD SEV AND GNSS MOD or RADIATION3 MOD or SEV</i>	<i>SWX EFFECT:</i>	<i>HF COM MOD SATCOM SEV GNSS SEV HF COM MOD AND GNSS MOD RADIATION MOD</i>

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8	Observed or expected space weather phenomena (M)	Day and time (in UTC) of observed phenomena (or forecast if phenomena have yet to occur); Horizontal extent ³ (latitude bands and longitude in degrees) and/or	OBS (or FCST) SWX:	nn/nn DAY HND EQ EQ HSD - W and AB nn/nn Nnn Wn Nnn Wn Nnn Wn [Nnn w]	OBS SWX::	08/0100Z DAYLIGHT SIDE 08/0100Z HNH HSH E18000 – W18000 08/0100Z HNH HSH W18000 – W09000 ABV FL350
9	Forecast of the phenomena (+6 HR) (M)	Day and time (in UTC) (6 hours from the time given in Item 8, rounded to the next full hour); Forecast extent and/or altitude of the space weather phenomena for that fixed valid time	FCST SWX +6 H R:	nn/nn nnZ DAY LIGH T SIDE or HNH and/o r MNH and/o r EQN and/o r EQS and/o r MSH and/o	OBS SWX::	08/0100Z DAYLIGHT SIDE 08/0100Z HNH HSH E18000 – W18000 08/0100Z HNH HSH W18000 – W09000 ABV FL350

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(Amendment)*

GN. No.352 (Contd.)

10	Forecast of the phenomena (+12 HR) (M)	Day and time (in UTC) (12 hours from the time given in Item 8, rounded to the next full hour). Forecast extent and/or altitude of the space weather phenomena for that fixed valid time	FCST SWX +12 HR :	FCST SWX +12 HR:	08/1300Z DAYLIGHT SIDE 08/1300Z HNH HSH W18000 – W09000 ABV FL350 08/1300Z HNH HSH E18000 – W18000
11	Forecast of the phenomena (+18 HR) (M)	Day and time (in UTC) (18 hours from the time given in Item 8, rounded to the next full hour). Forecast extent and/or altitude of the space weather phenomena for that fixed valid time	FCST SWX +18 HR:	FCST SWX +18 HR:	08/1900Z DAYLIGHT SIDE 08/1900Z HNH HSH W18000 – W09000 ABV FL350 08/1900Z HNH HSH E18000 – W18000

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(Amendment)

GN. No.352 (Contd.)

12	Forecast of the phenomena (+24 HR) (M)	Day and time (in UTC) (24 hours from the time given in Item 8, rounded to the next full hour). Forecast extent and/or altitude of the space weather phenomena for that fixed valid time	FCST SWX +24 HR:	FCST SWX +24 HR:	09/0100Z DAYLIGHT SIDE 09/0100Z HNH HSH W18000 – W09000 ABV FL350 09/0100Z HNH HSH E18000 – W18000
13	Remarks (M)	Remarks, as necessary	RMK: <i>Free text or NIL</i>	RMK:	SWX EVENT HAS CEASED WWW.SPACEWEATHER PROVIDER.GOV NIL
14	Next advisory (M)	Year, month, day and time in UTC	NXT ADVISORY:	NXT ADVISORY:	20161108/0700Z NO FURTHER ADVISORIES

Notes. —

Civil Aviation (Meteorological Service For International Air Navigation)
(Amendment)

GN. No.352 (Contd.)

1. Used only when the message issued to indicate that a test or an exercise is taking place. When the word "TEST" or the abbreviation "EXER" is included, the message may contain information that should not be used operationally or will otherwise end immediately after the word "TEST". [Applicable 7 November 2019]
2. Fictitious location.
3. One or more latitude ranges should be included in the space weather advisory information for "GNSS" and "RADIATION".

Example A2-3. Space weather advisory message (GNSS and HFCOM effects)

SWX	20161108/0100Z
ADVISORY	DONLON*
DTG:	2016/2
SWXC:	2016/1
ADVISORY	HF COM MOD AND GNSS MOD
NR:	08/0100Z HNH HSH E18000 – W18000
NR RPLC:	08/0700Z HNH HSH E18000 – W18000
SWX	08/1300Z HNH HSH E18000 – W18000
EFFECT:	08/1900Z HNH HSH E18000 – W18000
OBS SWX:	09/0100Z NO SWX EXP
FCST SWX	LOW LVL GEOMAGNETIC STORMING CAUSING INCREASED
+6 HR:	AURORAL ACT AND SUBSEQUENT MOD DEGRADATION OF
FCST SWX	GNSS AND HF COM AVBL IN THE AURORAL ZONE. THIS
+12 HR:	STORMING EXP TO SUBSIDE IN THE FCST PERIOD. SEE
FCST SWX	WWW.SPACEWEATHERPROVIDER.WEB
+18 HR:	NO FURTHER ADVISORIES
FCST SWX	
+24 HR	
RMK:	
NXT	
ADVISORY:	
* Fictitious location	

Civil Aviation (Meteorological Service For International Air Navigation)
(Amendment)

GN. No.352 (Contd.)

Example A2-4. Space weather advisory message (RADIATION effects)

SWX ADVISORY DTG: SWXC: ADVISORY NR: NR RPLC: SWX EFFECT: FCST SWX: FCST SWX +6 HR: FCST SWX +12 HR: FCST SWX +18 HR: FCST SWX +24 HR: RMK: NXT ADVISORY: * Fictitious location	20161108/0000Z DONLON* 2016/2 2016/1 RADIATION MOD 08/0100Z HNH HSH E18000 – W18000 ABV FL 350 08/0700Z HNH HSH E18000 – W18000 ABV FL 350 08/1300Z HNH HSH E18000 – W18000 ABV FL 350 08/1900Z HNH HSH E18000 – W18000 ABV FL 350 09/0100Z NO SWX EXP RADIATION LVL EXCEEDED 100 PCT OF BACKGROUND LVL AT FL350 AND ABV. THE CURRENT EVENT HAS PEAKED AND LVL SLW RTN TO BACKGROUND LVL. SEE WWW.SPACEWEATHERPROVIDER.WEB NO FURTHER ADVISORIES
--	--

Example A2-5. Space weather advisory message (HF COM effects)

Civil Aviation (Meteorological Service For International Air Navigation)
(Amendment)

GN. No.352 (Contd.)

SWX ADVISORY DTG: SWXC: ADVISORY NR: SWX EFFECT: OBS SWX: FCST SWX +6 HR: FCST SWX +12 HR: FCST SWX +18 HR: FCST SWX +24 HR RMK:	20161108/0100Z DONLON* 2016/1 HF COM SEV 08/0100Z DAYLIGHT SIDE 08/0700Z DAYLIGHT SIDE 08/1900Z DAYLIGHT SIDE 09/0100Z NO SWX EXP PERIODIC HF COM ABSORPTION AND LIKELY TO CONT IN THE NEAR TERM. CMPL AND PERIODIC LOSS OF HF ON THE SUNLIT SIDE OF THE EARTH EXP. CONT HF COM DEGRADATION LIKELY OVER THE NXT 7 DAYS. SEE WWW.SPACEWEATHERPROVIDER.WEB
NXT ADVISORY: * Fictitious location	20161108/0700Z

Civil Aviation (Meteorological Service For International Air Navigation)
(Amendment)

GN. No.352 (Contd.)

THIRD SCHEDULE

(Made under regulation 16(11))

TECHNICAL SPECIFICATIONS RELATED TO METEOROLOGICAL OBSERVATIONS
AND REPORTS

1. GENERAL PROVISIONS RELATED TO METEOROLOGICAL OBSERVATIONS

1.1 The meteorological instruments used at an aerodrome shall be situated in such a way as to supply data which are representative of the area for which the measurements are required.

Note.— Specifications concerning the siting of equipment and installations on operational areas, aimed at reducing the hazard to aircraft to a minimum, are contained in Civil Aviation(Aerodrome) regulations.

1.2 Meteorological instruments at aeronautical meteorological stations shall be exposed, operated and maintained in accordance with the practices, procedures and specifications promulgated by the World Meteorological Organization (WMO).

1.3 The observers at an aerodrome shall be located, in so far as is practicable, so as to supply data which are representative of the area for which the observations are required.

1.4 Where automated equipment forms part of an integrated semi-automatic observing system, displays of data which are made available to the local air traffic services units shall be a subset of and displayed parallel to those available in the local meteorological service unit. In those displays, each meteorological element shall be annotated to identify, as appropriate, the locations for which the element is representative.

2. GENERAL CRITERIA RELATED TO METEOROLOGICAL
REPORTS

2.1 Format of meteorological reports

2.1.1 Local routine and special reports shall be issued in abbreviated plain language, in accordance with the template shown in TableA3-1.

2.1.2 METAR and SPECI shall be issued in accordance with the template shown in Table A3-2 and disseminated in the METAR and SPECI code forms prescribed by WMO.

Note.— The METAR and SPECI code forms are contained in the Manual on Codes (WMO-No. 306), Volume I.1, Part A — Alphanumeric Codes.

2.1.3 METAR and SPECI shall be disseminated in *IWXXM GML* form in addition to the dissemination of the METAR and SPECI in accordance with 2.1.2.

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2.2 Use of CAVOK

When the following conditions occur simultaneously at the time of observation:

- a) visibility, 10 km or more, and the lowest visibility is not reported;

Note 1.— In local routine and special reports, visibility refers to the value(s) to be reported in accordance with 4.2.4.2 and 4.2.4.3; in METAR and SPECI, visibility refers to the value(s) to be reported in accordance with 4.2.4.4.

Note 2.— The lowest visibility is reported in accordance with 4.2.4.4 a).

- b) no cloud of operational significance;
- c) no weather of significance to aviation as given in 4.4.2.3, 4.4.2.5 and 4.4.2.6;

Information on visibility, runway visual range, present weather and cloud amount, cloud type and height of cloud base shall be replaced in all meteorological reports by the term “CAVOK”.

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:

- a) those values which most closely correspond with the operating minima of the operators using the aerodrome;
- b) those values which satisfy other local requirements of the air traffic services units and of the operators;
- c) an increase in air temperature of 2°C or more from that given in the latest report, or an alternative threshold value as agreed between the meteorological authority, the appropriate ATS authority and the operators concerned;
- d) the available supplementary information concerning the occurrence of significant meteorological conditions in the approach and climb-out areas as given in Table A3-1;
- e) when noise abatement procedures are applied in accordance with 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
- f) those values which constitute criteria for SPECI.

2.3.2 Where required in accordance with Chapter 4, 4.4.2 b), SPECI shall be issued whenever changes in accordance with the following criteria occur:

- a) when the mean surface wind direction has changed by 60° or more from that given in the latest report, the mean speed before and/or after the change being 5 m/s (10 kt) or more;

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- b) when the mean surface wind speed has changed by 5m/s(10kt) or more from that given in the latest report;
- c) when the variation from the mean surface wind speed (gusts) has changed by 5 m/s (10 kt) or more from that at the time of the latest report, the mean speed before and/or after the change being 7.5m/s (15kt) or more;
- d) when the onset, cessation or change in intensity of any of the following weather phenomena occurs:
- freezing precipitation
 - moderate or heavy precipitation (including showers thereof)
 - thunderstorm (with precipitation);
- e) when the onset or cessation of any of the following weather phenomena occurs:
- freezing fog
 - thunderstorm (without precipitation);
- f) when the amount of a cloud layer below 450 m (1 500 ft) changes:
- 1) from SCT or less to BKN or OVC; or
 - 2) from BKN or OVC to SCT or less.
- 2.3.3 Where required in accordance with regulation 21(2)(b), SPECI shall be issued whenever changes in accordance with the following criteria occur:
- a) when the wind changes through values of operational significance. The threshold values shall be established by the meteorological authority in consultation with the appropriate ATS authority and the operators concerned, taking into account changes in the wind which would:
- 1) require a change in runway(s) in use; and
 - 2) indicate that the runway tailwind and crosswind components have changed through values representing the main operating limits for typical aircraft operating at the aerodrome;
- b) when the visibility is improving and changes to or passes through one or more of the following values, or when the visibility is deteriorating and passes through one or more of the following values:
- 1) 800, 1 500 or 3 000 m; and
 - 2) 5 000 m, in cases where significant numbers of flights are operated in accordance with the visual flight rules; Note 1.— In local special reports, visibility refers to the value(s) to be reported in accordance with 4.2.4.2 and 4.2.4.3; in SPECI, visibility refers to the value(s) to be reported in accordance with 4.2.4.4.

Note 2.— Visibility refers to “prevailing visibility” except in the case where only the lowest visibility is reported in accordance with 4.2.4.4 b).

- c) when the runway visual range is improving and changes to or passes through one or

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more of the following values, or when the runway visual range is deteriorating and passes through one or more of the following values: 50, 175, 300, 550 or 800m;

d) when the onset, cessation or change in intensity of any of the following weather phenomena occurs:

- dust storm
- sandstorm
- funnel cloud (tornado or waterspout);

e) when the onset or cessation of any of the following weather phenomena occurs:

- low drifting dust, sand or snow
- blowing dust, sand or snow
- squall;

f) when the height of base of the lowest cloud layer of BKN or OVC extent is lifting and changes to or passes through one or more of the following values, or when the height of base of the lowest cloud layer of BKN or OVC extent is lowering and passes through one or more of the following values:

1) 30, 60, 150 or 300 m (100, 200, 500 or 1 000 ft); and

2) 450 m (1 500 ft), in cases where significant numbers of flights are operated in accordance with the visual flight rules;

g) when the sky is obscured and the vertical visibility is improving and changes to or passes through one or more of the following values, or when the vertical visibility is deteriorating and passes through one or more of the following values: 30, 60, 150 or 300 m (100, 200, 500 or 1 000 ft); and

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

Note.— Other criteria based on local aerodrome operating minima are to be considered in parallel with similar criteria for the inclusion of change groups and for the amendment of TAF developed in response to the Fifth Schedule.

2.3.4 When a deterioration of one weather element is accompanied by an improvement in another element, a single SPECI shall be issued; it shall then be treated as a deterioration report.

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 Internet-based services, in accordance with regional air navigation agreement.

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3.1.2 METAR and SPECI shall be disseminated to other aerodromes in accordance with regional air navigation agreement.

3.1.3 SPECI representing a deterioration in conditions shall be disseminated immediately after the observation. A SPECI representing a deterioration of one weather element and an improvement in another element shall be disseminated immediately after the observation.

3.1.4 A SPECI representing an improvement in conditions shall be disseminated only after the improvement has been maintained for 10 minutes; it shall be amended before dissemination, if necessary, to indicate the conditions prevailing at the end of that 10-minute period.

3.2 Local routine and special reports

3.2.1 Local routine reports shall be transmitted to local air traffic services units and shall be made available to the operators and to other users at the aerodrome.

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

a) any element for which there is in the local air traffic services unit a display corresponding to the one in the meteorological station, and where arrangements are in force for the use of this display to update information included in local routine and special reports; and

b) runway visual range, when all changes of one or more steps on the reporting scale in use are being reported to the local air traffic services unit by an observer on the aerodrome.

Local special reports shall also be made available to the operators and to other users at the aerodrome.

4. OBSERVING AND REPORTING OF
METEOROLOGICAL ELEMENTS

Introductory Note.— Selected criteria applicable to meteorological information referred to under 4.1 to 4.8 for inclusion in aerodrome reports are given in tabular form in Table A3-0.

4.1 Surface wind

4.1.1 Siting

4.1.1.1 Surface wind shall be observed at a height of 10 ± 1 m (30 ± 3 ft) above the

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ground.

4.1.1.2 Representative surface wind observations shall be obtained by the use of sensors appropriately sited. Sensors for surface wind observations for local routine and special reports shall be sited to give the best practicable indication of conditions along the runway and touchdown zones. At aerodromes where topography or prevalent weather conditions cause significant differences in surface wind at various sections of the runway, additional sensors shall be provided.

Note.— Since, in practice, the surface wind cannot be measured directly on the runway, surface wind observations for take-off and landing are expected to be the best practicable indication of the winds which an aircraft will encounter during take-off and landing.

4.1.2 Displays

4.1.2.1 Surface wind displays relating to each sensor shall be located in the meteorological station with corresponding displays in the appropriate air traffic services units. The displays in the meteorological station and in the air traffic services units shall relate to the same sensors, and where separate sensors are required as specified in 4.1.1.2, the displays shall be clearly marked to identify the runway and section of runway monitored by each sensor.

4.1.2.2 The mean values of, and significant variations in, the surface wind direction and speed for each sensor shall be derived and displayed by automated equipment.

4.1.3 Averaging

4.1.3.1 The averaging period for surface wind observations shall be:

- (a) 2 minutes for local routine and special reports and for wind displays in air traffic services units; and
- (b) 10 minutes for METAR and SPECI, except that when the 10-minute period includes a marked discontinuity in the wind direction and/or speed, only data occurring after the discontinuity shall be used for obtaining mean values; hence, the time interval in these circumstances shall be correspondingly reduced.

Note.— A marked discontinuity occurs when there is an abrupt and sustained change in wind direction of 30° or more, with a wind speed of 5 m/s (10 kt) before or after the change, or a change in wind speed of 5 m/s (10 kt) or more, lasting at least 2 minutes.

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

4.1.4 Accuracy of measurement

The reported direction and speed of the mean surface wind, as well as variations from the mean surface wind, shall meet the operationally desirable accuracy of measurement as given in the First Schedule.

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4.1.5

Reporting

4.1.5.1 In local routine reports, local special reports, 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 which 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, local special reports, METAR and SPECI:

- (a) the units of measurement used for the wind speed shall be indicated;
- (b) variations from the mean wind direction during the past 10 minutes shall be reported as follows, if the total variation is 60° or more:
 - 1) when the total variation is 60° or more and less than 180° and the wind speed is 1.5 m/s (3 kt) or more, such directional variations shall be reported as the two extreme directions between which the surface wind has varied;
 - 2) when the total variation is 60° or more and less than 180° and the wind speed is less than 1.5 m/s (3 kt), the wind direction shall be reported as variable with no mean wind direction; or
 - 3) when the total variation is 180° or more, the wind direction shall be reported as variable with no mean wind direction;
- (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) 2.5 m/s (5 kt) or more in local routine and special reports when noise abatement procedures are applied in accordance with the PANS-ATM (ICAO Doc 4444); or
 - 2) 5 m/s (10 kt) or more otherwise;
- (d) when a wind speed of less than 0.5 m/s (1 kt) is reported, it shall be indicated as calm;
- (e) when a wind speed of 50m/s(100kt) or more is reported, it shall be indicated to be more than 49m/s (99kt); and
- (f) when the 10-minute period includes a marked discontinuity in the wind direction and/or speed, only variations from the mean wind direction and mean wind speed occurring since the discontinuity shall be reported.

Note.— See note under 4.1.3.1.

4.1.5.3 In local routine and special reports:

- (a) if the surface wind is observed from more than one location along the runway, the locations for which these values are representative shall be indicated;

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(b) when there is more than one runway in use and the surface wind related to these runways is observed, the available wind values for each runway shall be given, and the runways to which the values refer shall be reported;

(c) when variations from the mean wind direction are reported in accordance with 4.1.5.2 b) 2), the two extreme directions between which the surface wind has varied shall be reported; and

(d) when variations from the mean wind speed (gusts) are reported in accordance with 4.1.5.2 c), they shall be reported as the maximum and minimum values of the wind speed attained.

4.1.5.4 In METAR and SPECI, when variations from the mean winds peed (gusts) are reported in accordance with 4.1.5.2 c), the maximum value of the wind speed attained shall be reported.

4.2 Visibility

4.2.1 Siting

4.2.1.1 When instrumented systems are used for the measurement of visibility, the visibility shall be measured at a height of approximately 2.5 m (7.5 ft) above the runway.

4.2.1.2 When instrumented systems are used for the measurement of visibility, representative visibility observations shall be obtained by the use of sensors appropriately sited. Sensors for visibility observations for local routine and special reports shall be sited to give the best practicable indications of visibility along the runway and touchdown zone.

4.2.2 Displays

When instrumented systems are used for the measurement of visibility, visibility displays relating to each sensor shall be located in the meteorological station with corresponding displays in the appropriate air traffic services units. The displays in the meteorological station and in the air traffic services units shall relate to the same sensors, and where separate sensors are required as specified in 4.2.1, the displays shall be clearly marked to identify the area, e.g. runway and section of runway, monitored by each sensor.

4.2.3 Averaging

When instrumented systems are used for the measurement of visibility, their output shall be updated at least every 60 seconds to permit provision of current representative values. The averaging period shall be:

(a) 1 minute for local routine and special reports and for visibility displays in air traffic services units; and

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(b) 10 minutes for METAR and SPECI, except that when the 10-minute period immediately preceding the observation includes a marked discontinuity in the visibility, only those values occurring after the discontinuity shall be used for obtaining mean values.

Note.— A marked discontinuity occurs when there is an abrupt and sustained change in visibility, lasting at least 2 minutes, which reaches or passes through criteria for the issuance of SPECI reports given in 2.3.

4.2.4

Reporting

4.2.4.1 In local routine reports, local special reports, 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.

Note.— Specifications concerning the use of CAVOK are given in 2.2.

4.2.4.2 In local routine and special reports, visibility along the runway(s) shall be reported together with the units of measurement used to indicate visibility.

4.2.4.3 In local routine and special reports, when instrumented systems are used for the measurement of visibility:

(a) if the visibility is observed from more than one location along the runway as specified in regulation 28, the values representative of the touchdown zone shall be reported first, followed, as necessary, by the values representative of the mid-point and stop-end of the runway, and the locations for which these values are representative shall be indicated; and

(b) when there is more than one runway in use and the visibility is observed related to these runways, the available visibility values for each runway shall be reported, and the runways to which the values refer shall be indicated.

4.2.4.4 In METAR and SPECI, visibility shall be reported as prevailing visibility, as defined in

regulation 3. When the visibility is not the same in different directions and

(a) when the lowest visibility is different from the prevailing visibility, and 1) less than 1 500 m or 2) less than 50 per cent of the prevailing visibility and less than 5 000 m; the lowest visibility observed shall also be reported and, when possible, its general direction in relation to the aerodrome reference point indicated by reference to one of the eight points of the compass. If the lowest visibility is observed in more than one direction, then the most operationally significant direction shall be reported; and

(b) when the visibility is fluctuating rapidly, and the prevailing visibility cannot be determined, only the lowest visibility shall be reported, with no indication of direction.

4.3 Runway visual range

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4.3.1 Siting

4.3.1.1 Runway visual range shall be assessed at a height of approximately 2.5 m (7.5 ft) above the runway for instrumented systems or assessed at a height of approximately 5 m (15 ft) above the runway by a human observer.

4.3.1.2 Runway visual range shall be assessed at a lateral distance from the runway centre line of not more than 120m. The site for observations to be representative of the touchdown zone shall be located about 300m along the runway from the threshold. The sites for observations to be representative of the mid-point and stop-end of the runway shall be located at 1000 to 1500m along the runway from the threshold and at about 300m from the other end of the runway. The exact position of these sites and, if necessary, additional sites shall be decided after considering aeronautical, meteorological, and climatological factors such as long runways, swamps, and other fog-prone areas.

4.3.2 Instrumented systems

Note.— Since accuracy can vary from one instrument design to another, performance characteristics are to be checked before selecting an instrument for assessing runway visual range. The calibration of a forward-scatter meter has to be traceable and verifiable to a transmissometer standard, the accuracy of which has been verified over the intended operational range. Guidance on the use of transmissometers and forward-scatter meters in instrumented runway visual range systems is given in the Manual of Runway Visual Range Observing and Reporting Practices (ICAO Doc9328).

4.3.2.1 Instrumented systems based on transmissometers, or forward-scatter meters shall be used to assess runway visual range on runways intended for Category II and III instrument approach and landing operations.

4.3.2.2 Instrumented systems based on transmissometers, or forward-scatter meters shall be used to assess runway visual range on runways intended for Category I instrument approach and landing operations.

4.3.3 Display

4.3.3.1 Where runway visual range is determined by instrumented systems, one display or more, if required, shall be located in the meteorological station with corresponding displays in the appropriate air traffic services units. The displays in the meteorological station and in the air traffic services units shall be related to the same sensors, and where separate sensors are required as specified in 4.3.1.2, the displays shall be clearly marked to identify the runway and section of runway monitored by each sensor.

4.3.3.2 Where runway visual range is determined by human observers, runway visual range shall be reported to the appropriate local air traffic services units, whenever there is a change in the value to be reported in accordance with the reporting scale (except where the provisions of 3.2.2 a) or b) apply). The transmission of such reports shall normally be completed within 15 seconds after the termination of the observation.

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4.3.4 Averaging

Where instrumented systems are used for the assessment of runway visual range, their output shall be updated at least every 60 seconds to permit the provision of current, representative values. The averaging period for runway visual range values shall be:

- (a) 1 minute for local routine and special reports and for runway visual range displays in air traffic services units; and
- (b) 10 minutes for METAR and SPECI, except that when the 10-minute period immediately preceding the observation includes a marked discontinuity in runway visual range values, only those values occurring after the discontinuity shall be used for obtaining mean values.

Note.— A marked discontinuity occurs when there is an abrupt and sustained change in runway visual range, lasting at least 2 minutes, which reaches or passes through the values 800, 550, 300 and 175 m.

4.3.5 Runway light intensity

When instrumented systems are used for the assessment of runway visual range, computations shall be made separately for each available runway. For local routine and special reports, the light intensity to be used for the computation shall 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;
- (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
- (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.

In METAR and SPECI, the runway visual range shall be based on the maximum light intensity available on the runway.

Note.— Guidance on the conversion of instrumented readings into runway visual range is given in table A3-0.

Commented [H1]: o be provided as guidance material

4.3.6 Reporting

4.3.6.1 In local routine reports, local special reports, 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.

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

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

(a) when runway visual range is above the maximum value that can be determined by the system in use, it shall be reported using the abbreviation "ABV" in local routine and special reports and the abbreviation "P" in METAR and SPECI, followed by the maximum value that can be determined by the system; and

(b) when the runway visual range is below the minimum value that can be determined by the system in use, it shall be reported using the abbreviation "BLW" in local routine and special reports and the abbreviation "M" in METAR and SPECI, followed by the minimum value that can be determined by the system.

4.3.6.4 In local routine and special reports:

(a) the units of measurement used shall be included.

(b) if runway visual range is observed from only one location along the runway, i.e., the touchdown zone, it shall be included without any indication of location;

(c) if the runway visual range is observed from more than one location along the runway, the value representative of the touchdown zone shall be reported first, followed by the values representative of the mid-point and stop-end and the locations for which these values are representative shall be indicated; and

(d) when there is more than one runway in use, the available runway visual range values for each runway shall be reported and the runways to which the values refer shall be indicated.

4.3.6.5 In METAR and SPECI:

(a) only the value representative of the touchdown zone shall be reported and no indication of location on the runway shall be included; and

(b) where there is more than one runway available for landing, touchdown zone runway visual range values shall be included for all such runways, up to a maximum of four, and the runways to which the values refer shall be indicated.

4.3.6.6 In METAR and SPECI when instrumented systems are used for the assessment of runway visual range, the variations in runway visual range during the 10-minute period immediately preceding the observation shall be included if the runway visual range values during the 10-minute period have shown a distinct tendency, such that the mean during the first 5 minutes varies by 100 m or more from the mean during the second 5 minutes of the period. When the variation of the runway visual range values shows an upward or downward tendency, this shall be indicated by the abbreviation "U" or "D", respectively. In circumstances when actual fluctuations during the 10-minute period show no distinct tendency, this shall be indicated using the abbreviation "N". When indications of tendency are not available, no abbreviations shall be included.

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4.4 Present weather

4.4.1 Siting

When instrumented systems are used for observing present weather phenomena listed under 4.4.2.3 and 4.4.2.4, representative information shall be obtained by the use of sensors appropriately sited.

4.4.2 Reporting

4.4.2.1 In local routine and special reports, observed present weather phenomena shall be reported in terms of type and characteristics and qualified with respect to intensity, as appropriate.

4.4.2.2 In METAR and SPECI, observed present weather phenomena shall be reported in terms of type and characteristics and qualified with respect to intensity or proximity to the aerodrome, as appropriate.

4.4.2.3 In local routine reports, local special reports, METAR and SPECI, the following types of present weather phenomena shall be reported, using the irrespective abbreviations and relevant criteria, as appropriate:

(a) Precipitation

Drizzle	DZ
Rain	RA
Snow	SN
Snow grains	SG
Ice pellets	PL
Hail	GR

— Reported when diameter of largest hailstones is 5 mm or more.

Small hail and/or snow pellets GS

— Reported when diameter of largest hailstones is less than 5mm.

(b) Obscuration (hydrometeors)

Fog FG
— Reported when visibility is less than 1 000 m, except when qualified by “MI”, “BC”, “PR” or “VC” (see 4.4.2.6 and 4.4.2.8).

Mist BR
— Reported when visibility is at least 1 000 m but not more than 5 000m.

(c) Obscuration (lithometeors)

— The following should be used only when the obscuration consists predominantly of lithometeors, and the visibility is 5 000 m or less except “SA” when qualified by “DR” (see 4.4.2.6) and volcanic ash.

Sand SA

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Dust(widespread)	DU
Haze	HZ
Smoke	FU
Volcanic ash	VA

(d) Other phenomena

Dust/sand whirls (dust devils)	PO
Squall	SQ
Funnel cloud (tornado or waterspout)	FC
Dust storm	DS
Sandstorm	SS

4.4.2.4 In automated local routine reports, local special reports, METAR and SPECI, in addition to the precipitation types listed under 4.4.2.3 a), the abbreviation UP shall 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, local special reports, METAR and SPECI, the following characteristics of present weather phenomena, as necessary, shall be reported, using their respective abbreviations and relevant criteria, as appropriate:

Thunderstorm TS
— Used to report a thunderstorm with precipitation in accordance with the templates shown in Tables A3-1 and A3-2. When thunder is heard or lightning is detected at the aerodrome during the 10-minute period preceding the time of observation but no precipitation is observed at the aerodrome, the abbreviation “TS” shall be used without qualification.

Freezing FZ
— Supercooled water droplets or precipitation, used with types of present weather phenomena in accordance with the templates shown in Tables A3-1 and A3-2.

Note.— At aerodromes with human observers, lightning detection equipment may supplement human observations. For aerodromes with automatic observing systems, guidance on the use of lightning detection equipment intended for thunderstorm reporting is given in the Manual on Automatic Meteorological Observing Systems at Aerodromes (ICAO Doc 9837).

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

Shower SH
— Used to report showers in accordance with the templates shown in Tables A3-1 and A3-2. Showers observed in the vicinity of the aerodrome (see 4.4.2.8) should be reported as “VCSH” without qualification regarding type or intensity of precipitation.

Blowing BL
— Used in accordance with the templates shown in Tables A3-1 and A3-2 with types of present weather phenomena raised by the wind to a height of 2 m (6 ft) or more above the ground.

Low drifting DR
— Used in accordance with the templates shown in Tables A3-1 and A3-2 with types of

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present weather phenomena raised by the wind to less than 2 m (6 ft) above ground level.

Shallow MI
— Less than 2 m (6 ft) above ground level.

Patches BC
— Fog patches randomly covering the aerodrome.

Partial PR
— A substantial part of the aerodrome covered by fog while the remainder is clear.

4.4.2.7 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 shall not be characterized by SH.

4.4.2.8 In local routine reports, local special reports, METAR and SPECI, the relevant intensity or, as appropriate, the proximity to the aerodrome of the reported present weather phenomena shall be indicated as follows:

	<i>(local routine and special reports)</i>	<i>(METAR and SPECI)</i>
<i>Light</i>	<i>FBL</i>	—
<i>Moderate</i>	<i>MOD</i>	<i>(no indication)</i>
<i>Heavy</i>	<i>HVY</i>	+

Used with types of present weather phenomena in accordance with the templates shown in Tables A3-1 and A3-2. Light intensity should be indicated only for precipitation.

Vicinity *VC*
— *Between approximately 8 and 16 km of the aerodrome reference point and used only in METAR and SPECI with present weather in accordance with the template shown in Table A3-2 when not reported under 4.4.2.5 and 4.4.2.6.*

4.4.2.9 In local routine reports, local special reports, METAR and SPECI:

(a) one or more, up to a maximum of three, of the present weather abbreviations given in 4.4.2.3 and 4.4.2.4 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;

(b) the indication of intensity or proximity, as appropriate, shall be reported first followed respectively by the characteristics and the type of weather phenomena; and

(c) where two different types of weather are observed, they shall be reported in two separate groups, where the intensity or proximity indicator refers to the weather phenomenon which follows the indicator. However, different types of precipitation occurring at the time of observation shall be reported as one single group with the dominant type of precipitation reported

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first and preceded by only one intensity qualifier which refers to the intensity of the total precipitation.

4.4.2.10 In automated local routine reports, local special reports, METAR and SPECI, the present weather shall 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

When instrumented systems are used for the measurement of the cloud amount and the height of cloud base, representative observations shall 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 shall be sited to give the best practicable indications of the cloud amount and height of cloud base at the threshold of the runway in use. For that purpose, a sensor shall be installed at a distance of less than 1 200 m (4 000 ft) before the landing threshold.

4.5.2 Display

When automated equipment is used for the measurement of the height of cloud base, height of cloud base display(s) shall be located in the meteorological station with corresponding display(s) in the appropriate air traffic services units. The displays in the meteorological station and in the air traffic services units shall relate to the same sensor, and where separate sensors are required as specified in 4.5.1, the displays shall clearly identify the area monitored by each sensor.

4.5.3 Reference level

The height of cloud base shall be reported above aerodrome elevation. When a precision approach runway is in use which has a threshold elevation 15 m (50 ft) or more below the aerodrome elevation, local arrangements shall be made in order that the height of cloud bases reported to arriving aircraft shall refer to the threshold elevation. In the case of reports from offshore structures, the height of cloud base shall be given above mean sea level.

4.5.4 Reporting

4.5.4.1 In local routine reports, local special reports, 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).

4.5.4.2 At aerodromes where low-visibility procedures are established for approach and landing, as agreed between the meteorological authority and the appropriate ATS authority, in local routine and special reports the height of cloud base shall 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 (2000 ft).

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4.5.4.3 In local routine reports, local special reports, METAR and SPECI:

- (a) cloud amount shall be reported using the abbreviations “FEW” (1 to 2 oktas), “SCT” (3 to 4 oktas), “BKN” (5 to 7 oktas) or “OVC” (8oktas);
- (b) cumulonimbus clouds and towering cumulus clouds shall be indicated as “CB” and “TCU”, respectively;
- (c) the vertical visibility shall be reported in steps of 30m (100ft) up to 600m (2000ft);
- (d) if there are no clouds of operational significance and no restriction on vertical visibility and the abbreviation “CAVOK” is not appropriate, the abbreviation “NSC” shall be used;
- (e) when several layers or masses of cloud of operational significance are observed, their amount and height of cloud base shall be reported in increasing order of the height of cloud base, and in accordance with the following criteria:
 - 1) the lowest layer or mass, regardless of amount to be reported as FEW, SCT, BKN or OVC as appropriate;
 - 2) the next layer or mass, covering more than 2/8 to be reported as SCT, BKN or OVC as appropriate;
 - 3) the next higher layer or mass, covering more than 4/8 to be reported as BKN or OVC as appropriate; and
 - 4) cumulonimbus and/or towering cumulus clouds, whenever observed and not reported in 1) to 3);
- (f) when the cloud base is diffuse or ragged or fluctuating rapidly, the minimum height of cloud base, or cloud fragments, shall be reported; and
- (g) when an individual layer (mass) of cloud is composed of cumulonimbus and towering cumulus clouds with a common cloud base, the type of cloud shall be reported as cumulonimbus only.

Note. — Towering cumulus indicates cumulus congestus clouds of great vertical extent.

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.

4.5.4.5 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.

4.5.4.6 In automated local routine reports, local special reports, METAR and SPECI:

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- a) when the cloud type cannot be observed by the automatic observing system, the cloud type in each cloud group shall be replaced by “///”;
- b) when no clouds are detected by the automatic observing system, it shall be indicated by using the abbreviation “NCD”;
- c) when cumulonimbus clouds or towering cumulus clouds are detected by the automatic observing system and the cloud amount and/or the height of cloud base cannot be observed, the cloud amount and/or the height of cloud base shall be replaced by “///”; and
- d) the vertical visibility shall be replaced by “///” when the sky is obscured, and the value of the vertical visibility cannot be determined by the automatic observing system due to a temporary failure of the system/sensor.

4.6 Air temperature and dew-point temperature

4.6.1 Display

When automated equipment is used for the measurement of air temperature and dew-point temperature, air temperature and dew-point temperature displays shall be located in the meteorological station with corresponding displays in the appropriate air traffic services units. The displays in the meteorological station and in the air traffic services units shall relate to the same sensors.

4.6.2 Reporting

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

4.7 Atmospheric pressure

4.7.1 Display

When automated equipment is used for the measurement of atmospheric pressure, QNH and, if required in accordance with 4.7.3.2 b), QFE displays relating to the barometer shall be located in the meteorological station with corresponding displays in the appropriate air traffic services units. When QFE values, as

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specified in

4.7.3.2 d), the displays shall be clearly marked to identify the runway to which the QFE value displayed refers.

4.7.2

Reference level

The reference level for the computation of QFE shall be the aerodrome elevation. For non-precision approach runways, the thresholds of which are 2 m (7 ft) or more below the aerodrome elevation, and for precision approach runways, the QFE, if required, shall refer to the relevant threshold elevation.

4.7.3

Reporting

4.7.3.1 For local routine reports, local special reports, 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:

- (a) QNH shall be included;
- (b) QFE shall be included if required by users or as agreed between the meteorological authority, the appropriate ATS authority and the operators concerned, on a regular basis;
- (c) the units of measurement used for QNH and QFE values shall be included; and
- (d) if QFE values are required for more than one runway, the required QFE values for each runway shall be reported and the runways to which the values refer shall be indicated.

4.7.3.3 In METAR and SPECI, only QNH values shall be included.

4.8 Supplementary information

4.8.1 Reporting

4.8.1.1 In local routine reports, local special reports, 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, shall 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:

- freezing precipitation
- moderate or heavy precipitation (including showers thereof)
- blowing snow
- dust storm, sandstorm
- thunderstorm

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- funnel cloud (tornado or waterspout)
- volcanic ash

Note.— The meteorological authority, in consultation with users, may agree not to provide recent weather information where SPECI are issued.

4.8.1.2 In local routine and special reports, the following significant meteorological conditions, or combinations thereof, shall be reported in supplementary information:

— cumulonimbus clouds	CB
— thunderstorm	TS
— moderate or severe turbulence	MOD
TURB, SEVTURB	
— wind shear	WS
— hail	GR
— severe squall line	SEVSQL
— moderate or severe icing	MOD ICE,
SEVICE	
— freezing precipitation	FZDZ,
FZRA	
— severe mountain waves	SEV MTW
— duststorm, sandstorm	DS, SS
— blowing snow	BLSN
— funnel cloud (tornado or waterspout)	FC

The location of the condition shall be indicated. Where necessary, additional information shall be included using abbreviated plain language.

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

Note.— The meteorological authority, in consultation with users, may agree not to provide recent weather information where SPECI are issued.

4.8.1.4 In METAR and SPECI, where local circumstances so warrant, information on wind shear shall be added.

Note.— The local circumstances referred to in 4.8.1.4 include, but are not necessarily limited to, wind shear of a non-transitory nature such as might be associated with low-level temperature inversions or local topography.

4.8.1.5 In METAR and SPECI, the following information shall 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
- (b) information on the state of the runway provided by the appropriate airport authority.

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Note 1.— The state of the sea is specified in 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 the Manual on Codes (WMO-No. 306), Volume I.1, Part A — Alphanumeric Codes, Code Tables 0366, 0519, 0919 and 1079.

Notes.—

1. Considered for the past 10 minutes (exception: if the 10-minute period includes a marked discontinuity (i.e., runway visual range changes or passes 175, 300, 550 or 800 m, lasting ≥ 2 minutes), only data after the discontinuity to be used). A simple diagrammatic convention is used to illustrate those parts of the 10-minute period prior to the observation relevant to runway visual range criteria, i.e. AB, BC and AC.
2. Layer composed of CB and TCU with a common base should be reported as "CB".
3. Considered for the past 10 minutes (exception: if the 10-minute period includes a marked discontinuity (i.e., The direction changes $\geq 30^\circ$ with a speed ≥ 5 m/s or the speed changes ≥ 5 m/s lasting ≥ 2 minutes), only data after the discontinuity to be used).
4. If several directions, the most operationally significant direction used.
5. Let R 5(AB) = 5-minute mean runway visual range value during period AB and R 5(BC) = 5-minute mean runway visual range value during period BC.
6. CB (cumulonimbus) and TCU (towering cumulus=cumulus congestus of great vertical extent) if not already indicated as one of the other layers.
7. Time averaging, for mean values and, if applicable, referring period for extreme values, indicated in the upper left-hand corner.
8. According to the *Manual on Codes* (WMO-No. 306), Volume I.1, Part A — *Alphanumeric Codes*, paragraph 15.5.5, it is recommended that the wind measuring system should be such that peak gust should represent a three-second average".
9. N/A = not applicable.
10. QFE is to be included if required. Reference elevation for QFE should be aerodrome elevation except for precision approach runways, and non-precision approach runways with threshold ≥ 2 m (7ft) below or above aerodrome elevation, where the reference level should be there levant threshold elevation.
11. As listed in Appendix 3.4.8.
12. Also, sea-surface temperature, and state of the sea or the significant wave height from offshore structures in accordance with regional air navigation agreement.
13. Report if RVR and/or VIS < 1500m, limits for assessments 50 and 2000m.
14. For landing at aerodromes with precision approach runways and with the threshold elevation ≥ 15 m below the aerodrome elevation, the *threshold elevation* to be used as a reference.
15. Measured in 0.1hPa.

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

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special reports are shown in Table A3-4 of this Schedule.

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).

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Dodoma
11th May, 2023

MAKAME M. MBARAWA,
Minister for Works and Transport