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AIC
Series A
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AIR NAVIGATION SERVICES

METEOROLOGICAL SERVICES

1. This AIC replaces AIC 43-1 dated 2003-11-10.

2. These Meteorological Aviation Codes have been introduced in accordance with ICAO standards.

3. In the interest of aviation safety, you are advised to familiarise yourself with these codes as per the attached Appendix A.

4. The aviation codes, like all meteorological codes are composed of a set of CODE FORMS and BINARY CODES made up of SYMBOLIC LETTERS (or groups of letters) representing meteorological or, as the case may be, geographical elements. In messages, these symbolic letters (or groups of letters) are transcribed into figures indicating the value or the state of the elements described. SPECIF/CATIONS have been defined for the various symbolic letters to permit their transcription into figures. In some cases, the specification of the symbolic letter is sufficient to permit a direct transcription into figures. In other cases, it requires the use of CODE FIGURES, the specifications of which are given in Addendum 20.

Information to be notified
CHAPTER 1

METAR - Aviation routine weather report (with or without trend forecast)
SPECI - Aviation selected special weather report (with or without trend forecast)

CODE FORM:

METAR YYGGggZ

(METAR / or / SPECI) CCCC YYGGggZ (AUTO) dddffGf$_m$f$_m$ (RMH or / RT or / MPS) d$_n$d$_n$d$_n$d$_x$d$_x$d$_x$

(VVVVD$_v$ / or / CAVOK) V$_x$V$_x$V$_x$V$_x$D$_x$ (RD$_R$D$_R$/V$_x$V$_x$V$_x$V$_{xi}$ / or / RD$_R$D$_R$/V$_x$V$_x$V$_x$V$_x$ V$_x$V$_x$V$_x$V$_{xi}$) w`w` (N$_s$N$_s$N$_s$h$_s$h$_s$h$_s$ / or / VVh$_s$h$_s$h$_s$ / or / SRC)

T`T`/T`$_d$T`$_d$ QP$_u$P$_u$P$_u$ REw`w` (WS RWYD$_R$D$_R$ / and/or / WS ALL RWY) (WT$_s$T$_s$/SS) (R$_R$R$_R$E$_R$C$_{Re\ re}$B$_R$B$_R$)

((TTTTT / or / NOSIG)) TTGGgg dddffgf$_m$f$_m$ (KMH or / KT or / MPS) (VVVV / or / NSW) (w`w` / or / NSW) (N$_s$N$_s$N$_s$h$_s$h$_s$h$_s$ / or / VVh$_s$h$_s$h$_s$ / or / SKC / or / NSC)

(RMK…)

NOTES:

(1) METAR is the name of the code for an aviation routine weather report. SPECI is the name of the code for an aviation selected special weather report. A METAR report and a SPECI report have a trend forecast appended.

(2) The groups contain a non-uniform number of characters. When an element or phenomenon does not occur, the corresponding group, or the extension of a group, is omitted from a particular report. Detailed instructions are given for each group in the following Regulations. The groups enclosed in brackets are used in accordance with regional or national decisions. Groups may have to be repeated in accordance with the detailed instructions for each group.

(3) The code form includes a section containing the trend forecast identified either by a change indicator (TTTTT = BECMG or TEMPO as the case may be), or by the code word NOSIG.
(4) The governing criteria for issuing SPECI reports are specified in criteria for issuing SPEC! reports - Addendum 1.

REGULATIONS

1.1 GENERAL

1.1.1 The code name METAR or SPECI shall be included at the beginning of an individual report, followed by the location indicator of the observing station and the time of observation. In case of a meteorological bulletin, which may consist of more than one METAR report, the code name METAR followed by day of the month and the official time of observation in hours and minutes UTC, followed without a space by the letter indicator Z, shall be included in the first line of the text of the bulletin.

1.2 GROUP CCCC

The identification of the reporting station in each individual report shall be indicated by means of the ICAO location indicator.

1.3 GROUP YYGGggZ

1.3.1 The day of the month and the time of observation in hours and minutes UTC followed without a space by the letter Z shall be included in individual METAR reports within a bulletin of one or more than one report.
(a) If the actual time of observation deviates by more than 10 minutes from the official time of observation included as the first line of the text of the bulletin; or
(b) In accordance with the requirements established by the authorities concerned.

1.3.2 This group shall be included in each individual SPEC! report. In SPECI reports this group shall indicate the time of occurrence of the change(s) which justified the issue of the report.

1.4 CODE WORD (AUTO)

The optional code word AUTO may be inserted before the wind group. indicating a report containing folly automated observations without human intervention. If any element cannot be observed, the group in which it would have been encoded shall be replaced by the appropriate number of solidi. The number of solidi depends on the number of symbolic letters for the specific group which is not able to be reported; i.e. four visibility group, two for the present weather group and three or six for the cloud group, as appropriate.

$$\text{dddffG}f_m f_m \begin{cases} \text{KMH or} \\ \text{KT or } d_n d_n d_n V d_x d_x d_x \\ \text{MPS} \end{cases}$$

1.5 Groups

1.5.1 The mean true direction in degrees rounded off to the nearest 10 degrees from which the wind is blowing and the mean speed of the wind over the 10-minute period immediately preceding the observation shall be reported for dddff followed, without a space, by one of the abbreviations KMH, KT or MPS, to specify the unit used for reporting wind speed. Values of wind direction less than 100 shall be preceded by O and a wind from true north shall be reported as 360. Values of wind speed less than 10 units shall be preceded by 0. However, when the 10-minute period includes a marked discontinuity in the wind characteristics, only data after the discontinuity shall be used for obtaining mean wind speed and maximum gust values, and mean wind direction and variations of the wind direction, hence the time interval in these circumstances shall be correspondingly reduced.

NOTES:

(1) KMH, KT and MPS are the standard ICAO abbreviations for kilometres per hour, knots and metres per second, respectively.

(2) The unit of wind speed used is determined by national decision. However, the primary unit prescribed in ICAO Annex 5 for wind speed is the kilometre per hour (KMH), with the knot (KT) permitted for use as a non SI alternative unit until a termination date is decided - subject to a decision which is currently under review by ICAO. The unit used by NMS is knot (KT).

(3) A marked discontinuity occurs when there is a sustained change in wind direction of 30 or more, with a wind speed of 20 km h^{-1} (1O kt) before or after the change, or a change in wind speed of 20 km h^{-1} (10 kt) or more, lasting at least two minutes.

1.5.2 In the case of variable wind direction, ddd shall be encoded as VRB when the mean wind speed is 3 knots (2 ms^{-1} or 6 km h^{-1}) or less. A variable wind at higher speeds shall be reported only when the variation of wind direction is 180° or more, or when it is impossible to determine a single wind direction, for example when a thunderstorm passes over the aerodrome.

1.5.3 If, during the 10-minute period preceding the observation, the total variation in wind direction is 60 or more but less than 180° and the mean wind speed is greater than 3 knots (2 ms^{-1} or 6 km h^{-1}), the observed two extreme directions between which the wind has varied shall be given for $dndnd_nVd_xd_xd_x$ in clockwise order. Otherwise this group shall not be included.

1.5.4 "Calm" shall be coded as 00000 followed immediately, without a space, by one of the abbreviations KMH, KT or MPS to specify the unit, used normally for reporting wind.

1.5.5 If, during the 10-minute period preceding the observation, the maximum wind gust speed exceeds the mean speed by 10 knots (5 ms^{-1} or 20 km h^{-1}) or more, this maximum speed shall be reported as Gf_mf_m immediately after dddff, followed immediately, without a space, by one of the abbreviations KMH, KT or MPS to specify the units used for reporting wind speed. Otherwise the element Gf_mf_m shall not be included.

1.5.6 For wind speeds of 100 units or greater, the exact number of wind speed units shall be given in lieu of the two-figure code ff or f_mf_m. When the wind speed is 100 knots or more (50 ms^{-1} or 200 km h^{-1}), the groups ff and f_mf_m shall be preceded by the letter indicator P and reported as P99KT (P49MPS or P199KMH).

NOTE: *There is no aeronautical requirement to report surface wind speeds of 200 km h^{-1} (100 kt) or more; however, provision has been made for reporting wind speeds up to 399 km h^{-1} (199 kt) for non-aeronautical purposes, as necessary.*

1.6 GROUPS $VVVVD_v$ $V_xV_xV_xV_xD_v$

NOTE: *The coding of visibility is based on the use of the metre and kilometre, in accordance with the units specified in ICAO Annex 5. However, some Members in Region IV use statute miles and fractions thereof in accordance with national coding procedures as indicated in Volume II of this Manual.*

1.6.1 When no marked directional variation in the horizontal visibility is observed, visibility shall be given as VVVV and D_v shall not be included.

NOTE: *Directional variations of visibility are not considered to be marked unless the differences are at least 50% of the minimum visibility and are not required to be indicated when the minimum value is 5 000 metres or more.*

1.6.2 When the horizontal visibility is not the same in all directions, the minimum visibility shall be given for VVVV followed, without a space, by D_v consisting of one or two letters to indicate the general direction of the visibility reported as one of the eight points of the compass (N, NE, etc.). If the lowest visibility is observed in more than one direction, then D_v shall represent the most operationally significant direction. Significant directional differences from the reported visibility shall be reported in accordance with Regulation 1.6.3.

1.6.3 Directional variation in visibility $V_xV_xV_xV_xD_v$

When minimum visibility, reported in accordance with Regulation 1.6.2 and the note to Regulation 1.6.1, is less than l 500 metres while visibility in another direction is more than 5 000 metres, the group $V_xV_xV_xV_xD_v$ shall be used to report the value and direction of the maximum visibility. If the highest visibility is observed in more than one direction, then D_v shall represent the most operationally significant direction. Otherwise this group shall not be included.

1.6.4 Visibility shall be reported using the following reporting steps:

(a) Up to 800 metres rounded down to the nearest 50 metres;
(b) Between 800 and 5 000 metres rounded down to the nearest 100 metres;
(c) Between 5 000 and 9 999 metres rounded down to nearest 1 000 metres;
(d) With 9999 indicating 10 km or more.

1.6.5 Code word CAVOK

Regulation 1.10 shall apply.

$RD_RD_R/V_RV_RV_RV_{Ri}$
or
$RD_RD_R/V_RV_RV_RV_RVV_RV_RV_RV_{Ri}$

1.7 GROUPS

NOTE: *The coding of runway visual range is based on the use of the metre, in accordance with the unit specified in ICAO Annex 5. However, some Members in Region IV use feet in accordance with national coding procedures as indicated in Volume II of this Manual.*

1.7.1 During periods when either the horizontal visibility or the runway up to a maximum of four visual range for one or more up to a maximum of four) runways available for landing is observed to be less than 1 500 metres. one or more groups under Regulation 1.6 shall be included in the report. The letter indicator R followed immediately, without a space, by the runway designator D_RD_R shall always precede the RVR reports.

l.7.2 The groups shall be repeated to report runway visual range values for each runway up to a maximum of four which is available for landing and for which runway visual range is determined.

1.7.3 Runway designator D_RD_R

The designator of each runway for which runway visual range is reported shall be indicated by D_RD_R Parallel runways should be distinguished by appending to D_RD_R letters L, C or R indicating left, central or right parallel runway respectively. The letter shall be appended to D_RD_R, as necessary, in accordance with the standard practice for runway designation, as laid down by ICAO in Annex 14 - Aerodromes, Volume I - Aerodrome Design and Operations, paragraph 5.2.2.4 and 5.2.2.5.

1.7.4 Mean value and tendency of runway visual range over the 1O-minute period immediately preceding the observation $V_RV_RV_RV_Ri$

1.7.4.1 The runway visual range values to be reported shall be representative of the touchdown zone of the active landing runway(s) up to a maximum of four.

1.7.4.2 The mean value of the runway visual range over the 10-minute period immediately preceding the observation shall be reported for $V_RV_RV_RV_R$. However, when the 10-minute period includes a marked discontinuity in the RVR (for example, sudden advection of fog, rapid onset or cessation of an obscuring snow shower), only data after the discontinuity shall be used for obtaining mean RVR values and variations thereof, hence the time interval in these circumstances shall be correspondingly reduced.

NOTES:

(1) See Regulation 1.7. 5.

(2) Any observed value which does not fit the reporting scale in use should be rounded down to the nearest lower step in the scale.

(3) A marked discontinuity occurs when there is an abrupt and sustained change in runway visual range, lasting at least two minutes, consistent with the issuance of selected special reports given in Addendum 1 page 43.

1.7.4.3 If the runway visual range values during the IO-minute period preceding the observation show a distinct upward or downward tendency such that the mean during the first five minutes varies by 100 m or more from the mean during the second five minutes of the period, this shall be indicated by i = U for upward tendency and i = D for downward tendency of runway visual range. When no distinct change in runway range is observed i = N shall be used. When it is not possible to determine the tendency, i shall be omitted.

1.7.5 Significant variations of runway visual range $RD_RD_R/V_RV_RV_RV_RVV_RV_RV_Ri$

When the RVR at a runway varies significantly and when during the 10-minute. period preceding the nominal observation time the one-minute mean extreme values assessed vary from the mean

value by more than 50 metres or more than 20% of the mean value, whichever is greater, the one-minute mean minimum and the one-minute mean maximum values shall be given in that order in the form $RD_RD_R/V_RV_RV_RV_RVV_RV_RV_RV_Ri$ instead of the 10-minute mean. Extreme RVR values shall be reported in accordance with Regulation 1.7.6 and the tendency shall be indicated in accordance with Regulation 1.7.4.3.

1.7.6 Extreme values of runway visual range

When actual RVR values are outside the measuring range of the observing system in use, the following procedures shall apply:

(a) When the RVR, to be reported in accordance with the Technical Regulations, is greater than the maximum value which can be assessed with the system in use, the group $V_RV_RV_RV_R$ shall be preceded by the letter indicator $P(PV_RV_RV_RV_R)$ in which $V_RV_RV_RV_R$ is the highest value which can be assessed. When the RVR is assessed to be more than 1 500 metres, it shall be reported as P1500;

(b) When the RVR is below the minimum value which can be assessed with the system in use, the group $V_RV_RV_RV_R$ shall be preceded by the letter indicator $M(MV_RV_RV_RV_R)$ in which $V_RV_RV_RV_R$ is the lowest value which can be assessed. When the RVR is assessed to be less than 50 metres, it shall be reported as M0050.

1.8 GROUP w'w'

l.8.1 One or more groups w'w', but not more than three, shall be used to report all present weather phenomena observed at or near the aerodrome and of significance to aeronautical operations in accordance with w'w' - SIGNIFICANT PRESENT AND FORECAST WEATHER (Addendum2).

Appropriate intensity indicators and letter abbreviations (Addendum 2: w'w', SIGNIFICANT PRESENT AND FORECAST WEATHER) shall be combined in groups of two to nine characters to indicate present weather phenomena.

1.8.2 If the observed present weather cannot be reported by use of Code table (Addendum 2), the group w'w` shall be omitted from the report.

1.8.3 The w'w' groups shall be ordered as follows:

(a) First, if appropriate, the qualifier for intensity or for proximity, followed without a space by;

(b) If appropriate, the abbreviation for the descriptor followed without a space by;

(c) The abbreviation for the observed weather phenomenon or combinations thereof.

1.8.4 Intensity shall be indicated only with precipitation, precipitation associated with showers and/or thunderstorms, blowing dust, sand or snow, duststorm or sandstorm. If the intensity of the phenomena reported in the group is either light or heavy, this shall be indicated by the appropriate sign (see Addendum 2). No indicator shall be included in the group when the intensity of the reported phenomenon is moderate.

1.8.5 The intensity of present weather phenomena reported in the group w'w' shall be determined by the intensity at the time of observation.

1.8.6 If more than one significant weather phenomenon is observed, separate w'w' groups shall be included in the report in accordance with code table (Addendum 2). However, if more than one form of precipitation is observed, the appropriate letter abbreviations shall be combined in a single group with the dominant type of precipitation being reported first. In such a single group, the intensity shall refer to the total precipitation and be reported with one or no indicator as appropriate.

1.8.7 The qualifier SH shall be used to indicate precipitation of the shower type. When associated with the indicator VC, the type and intensity of precipitation shall not be specified.

NOTE: *Showers are produced by convective clouds. They are characterized by their abrupt beginning and end and by the generally rapid and sometimes great variations in the intensity of the precipitation. Drops and solid particles falling in a shower are generally larger than those falling in non-showery precipitations. Between showers, openings may be observed unless stratiform clouds fill the intervals between the cumuliform clouds.*

1.8.8 The qualifier TS shall be used to report the occurrence of a thunderstorm whenever thunder is heard within the 10-minute period preceding the time of the report. When appropriate, TS shall be followed immediately, without a space, by relevant letter abbreviations to indicate any precipitation observed. The letter abbreviation TS on its own shall be used to report a thunderstorm at the aerodrome but no precipitation observed.

NOTE: *A thunderstorm shall be regarded as being at the aerodrome from the time thunder is first heard, whether or not lightning is seen or precipitation is observed at the aerodrome. A thunderstorm shall be regarded as having ceased or being no longer at the aerodrome at the time thunder is last heard, and the cessation is confirmed if thunder is not heard for 10 minutes after this time.*

1.8.9 The qualifier FZ shall be used only to indicate supercooled water droplets or supercooled precipitation.

NOTES:

(1) Any fog consisting predominantly of water droplets at temperatures below OC shall be reported as freezing fog (FZFG) whether it is depositing rime ice or not.

(2) Whether or not the supercooled precipitation is of the shower type shall not be specified.

1.8.10 The qualifier VC shall be used to indicate the following significant weather phenomena observed in the vicinity of the aerodrome: TS, DS, SS, FG, FC SH, PO BLDU, BLSA and BLSN. Regulations referring to the combination of VC and FG are given in Regulation 1.8.17.

NOTES:

(1) Such weather phenomena should be reported with the qualifier VC only when observed within eight kilometres of the aerodrome perimeter but not at the aerodrome.
(2) See Regulation 1.8.7.

1.8.11 The letter abbreviation GR shall be used to report hail only when the diameter of the largest hailstones observed is 5 mm or more. The letter abbreviation GS shall be used to report small hail (diameter of the hailstones less than 5 mm) and/or snow pellets.

1.8.12 The letter abbreviation IC shall be used to indicate the phenomenon ice crystals (diamond dust). For w'w' = IC to be reported, the visibility shall be reduced by this phenomenon to 5 000 metres or less.

1.8.13 The letter abbreviation FU, HZ DU and SA (except DRSA) shall be used only when the obstruction to vision consists predominantly of lithometeors and the visibility is reduced by the reported phenomenon to 5 000 metres or less.

1.8.14 The letter abbreviation BR shall be used when the obstruction to vision consists of water droplets or ice crystals. For w'w' = BR to be reported, the visibility shall be at least 1 000 metres but not more than 5 000 metres.

1.8.15 The letter abbreviation FG shall be used when the obstruction to vision consists of water droplets or ice crystals (fog or ice fog). For w'w' = FG to be reported without the qualifiers MI, BC, PR or VC, the visibility shall be less than 1 000 metres.

1.8.16 For w'w' = MIFG to be reported, the visibility at two metres above ground level shall be l 000 metres or more and the apparent visibility in the fog layer shall be less than 1 000 metres.

1.8.17 The letter abbreviation VCFG shall be used to report any type of fog observed in the vicinity of the aerodrome.

1.8.18 The letter abbreviation BCFG shall be used to report fog patches and the letter abbreviation PRFG to report fog covering part of the aerodrome; the apparent visibility in the fog patch or bank shall be less than 1 000 metres, the fog extending to at least two metres above ground level.

NOTE: *BCFG should be used only when the visibility in parts of the aerodrome is 1 000 metres or more although when fog is close to the observing point, the minimum visibility reported by VVVVD_v will be less than 1 000 metres.*

1.8.19 The letter abbreviation SQ shall be used to report squalls when a sudden increase in wind speed is observed of at least 16 knots (32 km h^{-1}, 8 ms^{-1}), the speed rising to 22 knots (44 km h^{-1}, 11 ms^{-1}) or more and lasting for at least one minute.

1.8.20 Regulation 1.11 shall apply.

$N_sN_sN_sh_sh_sh_s$
or
$VVh_sh_sh_s$
or
SKC
or
NSC

1.9 GROUP

1.9.1. Cloud amount and cloud height $N_sN_sN_sh_sh_sh_s$

1.9.1.1 The cloud amount $N_sN_sN_s$ shall be reported as few (1 to 2 oktas), scattered (3 to 4 oktas), broken (5 to 7 oktas) or overcast (8 oktas), using the three-letter abbreviation FEW, SCT, BKN or OVC followed without space by the height of the base of the cloud layer (mass) $h_sh_sh_s$. If there are no clouds and no restriction on vertical visibility and the abbreviation CAVOK is not appropriate the abbreviation SKC is reported but visibility is restricted by FG, SS, DS, BR, FU, HZ, DU, IC and SA, vertical visibility shall not be reported. If there are no clouds below 1 500 M (5 000 FT) or below the highest minimum sector altitude, whichever is greater, no Cumulonimbus and no restriction on vertical visibility and the abbreviations CAVOK and SKC are not appropriate, then the abbreviation NSC be used.

1.9.1.2 The amount of each cloud layer (mass) shall be determined as if no other clouds existed.

1.9.1.3 The cloud group shall be repeated to report different layers or masses of cloud. The number of groups shall not exceed three, except that significant convective clouds, when observed, shall always be reported.

NOTE:

The following clouds shall be reported as significant convective clouds:

(a) Cumulonimbus cloud (CB)

(b) Cumulus conjestus of great vertical extent (TCU). The contraction TCU, taken from the term "towering Cumulus", is an ICAO abbreviation used in aeronautical meteorology to describe this cloud.

1.9.1.4 The selection of layers or masses of cloud to be reported shall be made in accordance with the following criteria:

1st group: the lowest individual layer (mass) of any amount, to be reported as FEW, SCT, BICN or OVC;

2nd group: the next individual layer (mass) covering more than two oktas, to be reported as SC"'T, BKN or OVC;

3rd group: the next higher individual layer (mass) covering more than four oktas, to be reported as BKN or OVC;

Additional groups: significant convective clouds (CB or TCU) when observed and not already reported in one of the three groups above.

The order of reporting the groups shall be from lower to higher levels.

1.9.1.5 The height of the base of the cloud layer (mass) shall be reported in steps of 30 metres (100 ft) up to 3 000 metres (10 000 ft) and in steps of 300 metres (1 000 ft) above 3 000 metres (10 000 ft) in the form of $h_sh_sh_s$.

NOTE: *See Note (2) to Regulation 1.6.4.2.*

1.9 .1.6 At mountain stations, when the cloud base is below station level, the cloud group shall read $N_sN_sN_s$///.

1.9.1.7 Types of cloud other than significant convective clouds shall not be identified. Significant convective clouds, when observed, shall be identified by appending the letter abbreviations CB (Cumulonimbus) or TCU (Cumulus congestus of great vertical extent), as appropriate, to the cloud group without a space.

NOTE: *When an individual layer (mass) of cloud is composed of Cumulonimbus and towering Cumulus cloud, with a common cloud base, the type of cloud should be reported as Cumulonimbus only and the amount of clouds shall be encoded as the sum of the CB and TCU amounts.*

1.9.2 Vertical visibility $VVh_sh_sh_s$

When the sky is obscured and information on vertical visibility is available, the group $VVh_sh_sh_s$ shall be reported, where $h_sh_sh_s$ is the vertical visibility in units of 30 metres (hundreds of feet). When information on vertical visibility is not available, the group shall read VV///.

NOTES:

(1) The vertical visibility is defined as the vertical visual range into an obscuring medium.

(2) See Note (2) to Regulation 1.6.4.2.

1.9.3 Regulation 1.10 shall apply.

1.10 CODE WORD CAVOK

The code word CAVOK shall be included in place of the groups under Regulation 1.7, 1.8 and 1.9, when the following conditions occur simultaneously at the time of observation:

(a} Visibility: 10 km or more;

(b) No cloud below 1 500 metres (5 000 ft) or below the highest minimum sector altitude, which ever is the greater, and no Cumulonimbus.

(c) No significant weather phenomena (see Addendum 2).

NOTE: Highest minimum sector altitude is defined in ICAO PANS-OPS, Part 1 - Definitions, as the lowest altitude which may be used under emergency conditions which will provide a minimum clearance of 300 metres (I 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 nautical miles) radius centred on a radio aid to navigation.

1.11 GROUP T`T`/T`$_d$T`$_d$

1.11.1 The observed air temperature and dew-point temperature rounded to the nearest whole degree Celsius shall be given for T`T`/T`$_d$T`$_d$. Observed values involving 0.5°C shall be rounded up to the next higher Celsius degree.

1.11.2 Rounded whole degree values of air temperature and dew-point temperature of -9°C to +9° C shall be preceded by 0; for example, +9°C shall be reported as 09.

1.11.3 Temperatures below 0°C shall be immediately preceded by M, that is minus; for example, -9°C shall be reported as M09 and -0.5°C shall be reported as M00.

1.12 GROUP QP$_H$P$_H$P$_H$P$_H$

1.12.1 The observed QNH value rounded down to the nearest whole hectopascals shall be given for P$_H$P$_H$P$_H$P$_H$ preceded, without a space, by the letter indicator Q.

1.12.2 If the value of QNH is less than 1 000 hPa, it shall be preceded by O; for example, QNH 995.6 shall be reported as Q0995.

NOTES:

(1) When the first digit following the letter indicator Q is either 0 or 1, the QNH values is reported in the unit hectopascals (hPa).

(2) The unit prescribed by ICAO Annex 5 for pressure is the hectopascals. However, if by national decision and in accordance with requirements established by the authorities concerned, inches of mercury is used as the unit for QNH, the group shall be preceded by the letter A (instead of Q), followed by the value in inches, tenths and hundredths of inch, but without the decimal point. For example, QNH 29.91 in. shall be given as A2991, QNH 30.27 in. shall be given as A3027. When the QNH value is reported in the unit of inches of mercury, the first digit following the letter indicator A is either 2 or 3.

NB: (2) not applicable in Namibia.

1.13 SUPPLEMENTARY INFORMATION - GROUPS

REw`w` { WSRWY$D_R D_R$ / and/or / WS ALL RWY } ($WT_s T_s$) ($R_R R_R C_R e_R B_R B_r$)

RE w`w` { WS RWY$D_R D_R$ / and/or / WS ALL RWY }

1.13.1 For international dissemination, the section on supplementary information shall be used only to report recent weather phenomena of operational significance and available information wind shear in the lower layers and, subject to regional air navigation agreement, sea-surface temperature and state of the sea, and also subject to regional air navigation agreement, the state of the runway.

1.13.2 Recent weather phenomena of operational significance REw'w'

1.13.2.1 Up to three groups of information on recent weather shall be given by the indicator letters RE followed, without a space. by the appropriate abbreviations, in accordance with Regulation 1.8 (but no intensity of the recent weather phenomena shall be indicated) if the following weather phenomena were observed during the period since the last routine report. or last hour, whichever is shorter, but not at the time of observation: No intensity of the recent weather phenomena shall

be indicated.

- Freezing precipitation;

- Moderate or heavy drizzle, rain or snow;

- Moderate or heavy: ice pellets, hail, small hail and/or snow pellets;

- Moderate or heavy blowing snow (including snowstorm);

- Sandstorm or duststorm;

- Thunderstorm;

- Funnel cloud(s) (tornado or water spout);

- Volcanic ash.

WS RWY$D_R D_R$
or
WS ALLL RWY

1.13.2.2 Wind shear in the lower layers

Information on the existence of wind shear along the take-off path or approach path between one runway level and 500 metres (1 600 ft) significant to aircraft operations shall be reported whenever available and local circumstances so warrant, using the group set WS RWY$D_R R_R$ repeated as necessary. If the wind shear along the take-off path or approach path is affecting all runways in the airport, WS ALL RWY shall be used.

NOTE: *Concerning runway designator $D_R D_R$ Regulation 1.6.3 applies.*

1.13.3 Recent weather phenomena of operational significance REw'w'

1.13.3.1 Information on recent weather shall be given by the indicator letters RE followed, without a space, by the appropriate abbreviations, in accordance with Regulation 1.7 if the following weather phenomena were observed during the hour since the last routine report, but not at the time of observation:

- Freezing precipitation;

- Moderate or heavy precipitation (including showers thereof);

- Moderate or heavy blowing snow (including snowstorm);

- Sandstorm or duststorm;

- Thunderstorm;

- Funnel cloud (tornado or water spout);

- Volcanic ash.

1.13.3.2 Weather shall only be included as recent weather if the same phenomenon (disregarding character of precipitation) of the same or greater intensity is not reported as present weather. For example, a heavy rainshower 20 minutes before the time of observation, with moderate rain at the time of observation, shall be coded RERA. However, moderate rain 20 minutes before the time of observation, with a moderate rainshower at the time of observation, shall not be reported as recent weather.

1.13.4 Supplementary information other than specified by Regulations 1.12.2 and l.12.3 shall be added only in accordance with regional decision.

1.13.5 Sea-surface temperature and the state of the sea (WT_sT_s/SS).

1.13.5.1 The sea-surface temperature shall, by regional agreement, be reported according to the regional ICAO Regulation 1.11. The state of the sea shall be reported in accordance with Addendum 21.

1.13.6 State of the runway ($D_RD_RE_RC_Re_Re_RB_RB_R$).

1.13.6.1 Subject to regional air navigation agreement, information on the state of the runway provided by the appropriate airport authority shall be included. The runway designator D_RD_R shall be reported according to Regulation 15.7.3. The runway deposits E_R the extent of runway contamination C_R, the depth of deposit e_Re_R and the friction coefficient/braking action B_RB_R shall be indicated in accordance with Addendums 22, 23, 24 and 25, respectively. The state of the runway group shall be replaced by the abbreviation SNOCLO when the aerodrome is closed due to extreme deposit of snow. If contamination of a single runway or on all runways at an aerodrome have ceased to exist; this should be reported by replacing the last six digits of the group by "CLRD".

1.14 TREND FORECASTS

NOTE: The governing criteria for issuing trend forecasts are specified in criteria for issuing trend forecasts (Addendum 3).

1.14.1 When included in METAR or SPECI reports, the trend forecast shall be in coded form and have a validity period of two hours from the time of the METAR or SPECI report.

1.14.2 When a change, required to be indicated in accordance with the governing criteria for significant changes, is expected for one or several of the observed elements - wind, horizontal visibility, present weather, clouds or vertical visibility - one of the following change indicators shall be used for TTTTT: BECMG or TEMPO.

NOTES:
(1) Where possible, values corresponding to the local operating minima should be selected to indicate changes.

(2) Highest minimum sector altitude is defined in ICAO PANS-OPS, Part 1 - Definitions, as the lowest altitude which may be used under emergency conditions which will provide a minimum clearance of 300 metres (1 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 nautical miles) radius centred on a radio aid to navigation.

1.14.3 The time group GGgg, preceded without a space by one of the letter indicators TT = FM (from), TL (until) or AT (at), shall be used as appropriate, to indicate the beginning (FM) or the end (TL) of a forecast change, or the time (AT) at which specific forecast condition(s) is(are) expected.

1.14.4 The change indicator BECMG shall be used to describe expected changes to meteorological conditions which reach or pass specified threshold criteria at either a regular or irregular rate.

1.14.5 Changes in meteorological conditions which reach or pass specified threshold criteria for trend forecasts shall be indicated as follows:

(a) When the change is forecast to begin and end wholly within the trend forecast period: by the change indicator BECMG followed by the letter indicator FM and TL respectively with their associated time groups, to indicate the beginning and end of the change (for example, for a trend forecast period for 1000 to 1200 UTC in the form: BECMG FM1030 TL1130);

(b) When the change is forecast to occur from the beginning of the trend forecast period and be completed before the end of that period: by the change indicator BECMG followed only by the letter indicator TL and its associated time group (the letter indicator FM and its associated time group being omitted), to indicate the end of the change (for example: BECMG TL1100);

(c) When the change is forecast to begin during the trend forecast period and be completed at the end of that period: by the change indicator BECMG followed only by the letter indicator FM and its associated time group (the letter indicator TL and its associated time group being omitted), to indicate the beginning of the change (for example: BECMG FM1100);

(d) When it is possible to specify a time for the change to occur during the trend forecast period: by the change indicator BECMG followed by the letter indicator AT and its associated time group, to indicate the time of the change (for example: BECMG AT1100);

(e) When changes are forecast to take place at midnight UTC, the time shall be indicated:

(i) By 0000 when associated with FM and AT;
(ii) By 2400 when associated with TL.

1.14.6 When the change is forecast to commence at the beginning of the trend forecast period and be completed by the end of that period, or when the change is forecast to occur within the trend forecast period but the time of the change is uncertain (possibly short after the beginning of the trend forecast period, or midway or near the end of that period), the change shall be indicated by only the change indicator BECMG (letter indicator(s) FM and TL or AT and associated time group(s) being omitted).

1.14. 7 The change indicator TEMPO shall be used to describe expected temporary fluctuations to meteorological conditions which reach or pass specified threshold criteria and last for a period of less than one hour in each instance and in the aggregate cover less than half of the forecast period during which the fluctuations are expected to occur.

1.14.8 Periods of temporary fluctuations to meteorological conditions which reach or pass specified threshold criteria shall be indicated as follows:

(a) When the period of temporary fluctuations is forecast to begin and end wholly within the trend forecast period: by the change indicator TEMPO followed by the letter indicators FM and TL respectively with their associated time groups, to indicate the beginning and end of the fluctuations (for example, for a trend forecast period from 1000 to 1200 UTC in the form: TEMPO FM1030 TL1130);

(b) When the period of temporary fluctuations is forecast to occur from the beginning of the trend forecast period but cease before the end of that period: by the change indicator TEMPO followed only by the letter indicator TL and its associated time group (the letter indicator FM and its associated time group being omitted), to indicate the cessation of the fluctuations (for example: TEMPO TL1130);

(c) When the period of temporary fluctuations is forecast to begin during the trend forecast period and cease by the end of that period: by the change indicator TEMPO followed only by the letter indicator FM and its associated time group (the letter indicator TL and its associated time group being omitted), to indicate the beginning of the fluctuation (for example: TEMPO FM1030).

1.14.9 When the period of temporary fluctuations to meteorological conditions is forecast to occur from the beginning of the trend forecast period and cease by the end of that period, the temporary

fluctuations shall be indicated by only the change indicator TEMPO (letter indicators FM and TL and associated time groups being omitted).

1.14.10 Following the change groups TTTTT (TTGGgg), only the group(s) referring to the element(s) which is(are) forecast to change significantly shall be included. However, in the case of significant changes of the clouds, all cloud groups, including any significant layer(s) or masses not expected to change, shall be given.

1.14.11 Regulation 1.5.6 shall apply.

1.14.12 Inclusion of significant forecast weather w'w', using the appropriate abbreviations in accordance with Regulation 1.8, shall be restricted to indicate the onset, cessation or change in intensity of the following weather phenomena:

- Freezing precipitation;

- Freezing fog;

- Moderate or heavy precipitation (including shower);

- Low drifting dust, sand or snow;

- Blowing dust, sand or snow (including snowstorm);

- Duststorm;

- Sandstorm;

- Thunderstorm (with or without precipitation);

- Squall;

- Funnel cloud (tornado or water-spout);

- Other weather phenomena given in Code table 4678 which are expected to cause a significant change in visibility.

1.14.13 To indicate the end of significant weather phenomena w'w', the abbreviation NSW (nil significant weather) shall replace the group w'w'.

1.14.14 To indicate a change to clear sky, the abbreviation SKC (sky clear) shall replace the groups $N_sN_sN_sh_sh_sh_s$ or $VVh_sh_sh_s$. When no cloud below 1 500 metres (5 000 ft) or the highest minimum sector altitude, whichever is greater, and no Cumulonimbus are forecast, and CAVOK or SKC are not appropriate, the abbreviation NSC shall be used.

1.14.15 When none of the elements listed in Regulation 1.13.2 is expected to change significantly as to require a change to be indicated, this shall be indicated by the code word NOSIG. NOSIG (no significant change) shall be used to indicate meteorological conditions which do not reach or pass specified threshold criteria.

1.14.16 Group (RMK …)

The indicator RMK denotes the beginning of a section containing information included by national decision which shall not be disseminated internationally.

CHAPTER 2

TAF-AERODROME FORECAST

CODE FORM:

CCCC YYGGggZ $Y_1Y_1G_1G_1G_1G_1$ dddffGf_mf_m { KMH or / KT or / MPS }

TAF

{ VVVV or / CAVOK } { w`w` or / NSW } { $N_sN_sN_sh_sh_sh_s$ or / $VVh_sh_sh_s$ or / SKC or NSC }

$TXT_FT_F/G_FG_FZTNT_FT_F/G_FG_FZ$

PROBC_2C_2 GGG$_E$G$_E$ { TTTTT GGG$_e$G$_e$ / or / TTGG }

NOTES:

(1) TAF is the name of the code for an aerodrome forecast.

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

(3) The groups in brackets are used in accordance with regional air navigation agreements.

REGULATIONS

2.1 GENERAL

2.1.1 The code name TAF shall be included at the beginning of an individual aerodrome forecast; in case of a meteorological bulletin, which may consist of one or more than one aerodrome forecast, the code name TAF shall be included at the beginning of the text of the bulletin.

2.1.2 The group YYGGggZ shall be included in each individual forecast to report the date and time of origin of forecast.

2.1.3 The description of forecast conditions shall contain at least information about wind, visibility, weather and cloud or vertical visibility.

2.1.4 The forecast shall cover the period $Y_1Y_1G_1G_1$ to G_2G_2. The forecast period may be divided into two or more self-contained parts by the use of the time indicator group TTGG in the form of FMGG. A complete description of the forecast prevailing conditions shall be given at the beginning of the forecast or the self-contained parts designated by FMGG. If any element is expected to change significantly during the forecast period or a self-contained part thereof, one or more sets of change groups TTTTT GGG_eG_e shall be added after the complete description of the conditions prevailing before the change. Each change group shall be followed by the modified elements subject to Regulation 2.1.4.

NOTES:

(1) The governing criteria for inclusion of change groups or for the amendment of TAFs shall be consistent with the criteria used for the issue of selected special reports (Addendum I).

(2) See regulation 2.11.1.

2.1.5 The group w'w' and/or the group $N_sN_sN_sh_sh_sh_s$ or $VVh_sh_sh_s$ shall be omitted if the corresponding element(s) is(are) expected to be absent or not significant. After change groups TTTTT GGG_eG_e, elements shall be omitted if they are not expected to differ significantly from the preceding values they possessed in the coded forecast (see Regulations 2.5.2, 2.6.7 and 2.6.9). However, in case of a significant reduction in visibility, the weather phenomenon forecast to cause the deterioration shall also be indicated and, in case of a significant change of the clouds, all cloud groups including any significant layer(s) or masses not expected to change shall be given.

2.2 GROUP CCCC

2.2.1 ICAO location indicators shall be used.

2.2.2 When the same forecast in a T AF bulletin applies to more than one aerodrome, a separate forecast shall be issued for each aerodrome concerned. Only indicator CCCC shall prefix each coded forecast.

$dddffgf_mf_m$ — KMH or / KT or / MPS

2.3 GROUP

2.3.1 The mean direction and speed of the forecast wind shall be indicated by dddff immediately followed, without a space, by one of the letter code indicators KMH, KT or MPS, as the case may be.

NOTES:

(1) KMH, KT and MPS are the standard ICAO abbreviations for kilometres per hour; knots and metres per second, respectively.

(2) The unit of wind used in Namibia is knots.

2.3.2 Regulations 1.4.2 and 1.4.4 shall apply.

2.3.3 ddd shall normally be encoded as VRB only when the mean wind speed is 3 knots (2 m s^{-1} or 6 km h^{-1}) or less. A variable wind at higher speeds shall be indicated only when it is impossible to forecast a single wind direction.

2.3.4 When it is forecast that the maximum wind speed will exceed the mean speed by 10 knots (5 m s^{-1} or 20 km h^{-1}) or more, the maximum wind speed shall be indicated by adding Gf_mf_m immediately after dddff.

NOTE: *If after a change group the wind is reported again, Gf_mf_m should be included, or not, in accordance with these same criteria.*

2.3.5 Regulation 1.4.6 shall apply.

2.4 GROUP VVVV

NOTE: The coding of visibility is based on the use of the metre and kilometre, in accordance with the units specified in ICAO Annex 5. However, in Region IV, a statute mile and fractions thereof are used in accordance with national coding procedures as indicated in the Volume II of Manual, Regional Codes and National Coding Practices.

2.4.1 When the horizontal visibility is forecast not to be the same in different directions, the minimum visibility shall be given for VVVV.

2.4.2 Regulation 2.7 shall apply.

2.4.3 Values to indicate forecast visibility shall be in conformity with those set out in Regulation 1.5.4.

w'w'
or
NSW

2.5 GROUP

2.5.1 Inclusion of significant forecast weather w'w', using the appropriate abbreviations in accordance with Regulation 1.7, shall be restricted to indicate the occurrence of the following weather phenomena:

- Freezing precipitation;

- Freezing fog;

- Moderate or heavy precipitation (including showers thereof);

- Low drifting dust, sand or snow;

- Blowing dust, sand or snow (including sandstorm);

- Duststorm;

- Sandstorm;

- Thunderstorm (with or without precipitation);

- Squall;

- Funnel cloud (tornado or waterspout);

- Other weather phenomena given in w'w' - SIGNIFICANT AND FORECAST WEATHER

(Addendum 2) which are expected to cause a significant change in visibility,

2.5.2 To indicate the end of significant weather phenomena w'w', the abbreviation NSW (no significant weather) shall replace the group w'w'.

NOTE: *See Regulation 2.11.3.*

2.5.3 Regulation 2.7 shall apply.

$N_sN_sN_sh_sh_sh_s$
or
$VVh_sh_sh_s$
or
SKC (or NSC)

2.6 GROUP

2.6.1 Cloud amount and cloud height $N_sN_sN_sh_sh_sh_s$

2.6.1.1 The cloud amount $N_sN_sN_s$ shall be given as few (1-2 oktas), scattered (3 to 4 oktas), broken (5 to 7 oktas) or overcast (8 oktas), using the three-letter abbreviations FEW, SCT, BKN and OVC followed, without a space, by the height of the base of the cloud layer (mass) $h_sh_sh_s$

2.6.1.2 Subject to Regulation 2.6.1.4, in any cloud group, $N_sN_sN_s$ shall be the total amount of cloud that the forecaster expects to be at the level given by $h_sh_sh_s$.

2.6.1.3 The cloud group shall be repeated to indicate different layers or masses of cloud forecast The number of groups shall not exceed three, except that Cumulonimbus clouds, when forecast, shall always be included.

2.6.1.4 The selection of forecast layers or masses of cloud to be included shall be made in accordance with the following criteria:

1st group: the lowest individual layer (mass) of any amount, to be indicated as FEW, SCT, BKN or OVC;

2nd group: the next individual layer (mass covering more than two oktas, to be indicated as SCT, BKN or OVC;

3rd group: the next higher individual layer (mass) covering more than four oktas, to be indicated as BKN or OVC;

Additional groups: Cumulonimbus clouds (CB) when forecast if not already included in one of the three groups above.

The order of inclusion of the groups shall be from lower to higher levels.

2.6.1.5 The height of the base of the forecast cloud layer (mass) shall be coded in units of 30 metres (100 ft) in the form $h_sh_sh_s$.

2.6.1.6 Types of forecast clouds other than Cumulonimbus clouds shall not be given. Cumulonimbus clouds when expected shall be indicated by appending the letter abbreviations CB to the cloud group without a space. In case CB and TCU are forecast with the same height of cloud base, the cloud amount shall be the sum of the CB and TCU amounts and the cloud type given as CB.

2.6.1.7 When clear sky is forecast, the cloud group shall not be used except after a change group when the abbreviation SKC shall be used.

2.6.2 Vertical visibility $VVh_sh_sh_s$

When the sky is expected to be obscured and information on vertical visibility is available, the group $VVh_sh_sh_s$ shall be used in lieu of $N_sN_sN_sh_sh_sh_s$, where $h_sh_sh_s$ shall be the vertical visibility in units of 30 metres (hundreds of feet).

NOTE: *See Note (1) to Regulation 1.9.2*

2.6.3 Cloud information shall be limited to cloud of operational significance, i.e. cloud below 1 500 metres (5 000 ft) or below the highest minimum sector altitude, whichever is greater, and Cumulonimbus whenever forecast. In applying this limitation, when no Cumulonimbus and no cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater, are forecast, and CAVOK or SKC are not appropriate, the abbreviation NSC shall be used. See note in paragraph 1.14.2.

2.6.4 Regulation 2.7 shall apply.

2.7 CODE WORD CAVOK

When it is expected that the following conditions will apply simultaneously, the code word CAVOK shall be included in place of the groups VVVV, w'w' and $N_sN_sN_sh_sh_sh_s$ or $VVh_sh_sh_s$:

(a) Visibility: 10 km or more;

(b) No cloud below 1 500 metres (5 000 ft) or below the highest minimum sector altitude, which ever is the greater, and no Cumulonimbus.

(c) No weather of significance to aviation as given in addendum 2.

NOTE: *See note under Regulation 1.10.*

2.8 GROUP $TXT_FT_F/G_FG_FZTNT_FT_F/G_FG_FZ$

2.8.1 To indicate forecast maximum and minimum temperatures expected to occur at the time indicated by G_FG_FZ, the letter TX for the maximum forecast temperature and TN for the minimum forecast temperature shall precede T_FT_F without a space.

TTTTT GGG_eG_e

or

TTGG

2.9 GROUP

2.9.1 These groups shall be used when, during the period G_1G_1 to G_2G_2, a change in some or all of the elements forecast is expected to occur at some intermediate time GGgg or during the period GG to G_eG_e. Such groups shall not be introduced until all the data groups necessary to describe the elements forecast in the period G_1G_1 to GG have been given.

NOTES:
(1) If the end of the forecast period is midnight, G_eG_e should be indicated as 24.
(2) See Note (1) to Regulation 2.1.4.

2.9.2 The time indicator group TTGGgg in the form of FMGGgg (from GGgg) shall be used to indicate the beginning of a self-contained part of the forecast indicated by GGgg. When the group FMGGgg is used, all forecast conditions given before the group FMGGgg are superseded by the conditions indicated after the group.

2.9.3 The change groups TTTTTGGG$_e$G$_e$ in the form of BECMG GGG$_e$G$_e$ shall indicate a change to forecast meteorological conditions expected to occur at either a regular or irregular rate at an unspecified time within the period GG to G$_e$G$_e$. The duration of the period GG to G$_e$G$_e$ shall normally not exceed two hours and in any case shall not exceed four hours. The change groups shall be followed by a description of all the elements for which a change is forecast. When an element is not described in data groups which follow the change groups, the description of this element for the period between G$_1$G$_1$ and G$_2$G$_2$ shall be considered to remain valid subject to Regulation 2.1.5.

NOTE: *The conditions described after the groups BECMG GGG$_e$G$_e$ are those expected to prevail from G$_e$G$_e$ until G$_2$G$_2$, unless a further change is expected, in which case a further set of change groups BECMG GGG$_e$G$_e$ or FMGGgg must be used.*

2.9.4 The change groups TTTTT GGG$_e$G$_e$ in the form of TEMPO GGG$_e$G$_e$ shall indicate frequent or infrequent temporary fluctuations to forecast meteorological conditions which ate expected to last less than one hour in each instance and, in the aggregate cover, less than half of the period indicated by GGG$_e$G$_e$.

NOTES:

(1) If the modified forecast condition is expected to last one hour or more, Regulation 2.11.2 or 2.11.3 applies, i.e. the change groups BECMG GGG$_e$G$_e$ or FMGGgg must be used at the beginning and end of the period during which conditions are expected to depart from those forecast prior to GG or GGgg.

(2) To keep forecasts clear and unambiguous, the use of change indicators should be carefully considered and kept to a minimum. In particular, the overlapping of change periods should be avoided. At any time during the period of validity of the TAF, only one possible variation to the prevailing forecast conditions should normally be indicated. The subdivision of the forecast period by FMGGgg should be used to avoid too complex forecasts in cases where many significant changes to weather conditions are expected to occur throughout the forecast period.

2.10 GROUPS PROBC$_2$C$_2$ GGG$_e$G$_e$

2.10.1 In order to indicate the probability of occurrence of an alternative value of a forecast element, the groups PROBC$_2$C$_2$ GGG$_e$G$_e$ shall be placed directly before the alternative value. For C$_2$C$_2$ only the values 30 and 40 shall be used to indicate the probabilities 30% and 40% respectively.

NOTE: *A probability of less than 30% of actual values deviating from those forecast is not considered to justify the use of the group PROB. When the possibility of an alternative value is 50% or more, this should be indicated by the use of BECMG or FM as appropriate.*

2.10.2 A probability statement may also be related to the occurrence of temporary fluctuations. In this case, the group $PROBC_2C_2$ shall be placed immediately before the change group TEMPO and the group GGG_eG_e shall be placed after TEMPO (for example PROB30 TEMPO 1216).

2.10.3 The group $PROBC_2C_2$ shall not be used in combination with the change indicator group BECMG or the time indicator group FMGGgg.

2.11 GROUP (TT_FT_F/G_FG_FZ)

2.11.1 To indicate forecast temperature(s) at the time indicated by G_FG_FZ, one or more groups TT_FF/G_FG_FZ shall be used, if required. The letter indicator T shall precede T_FT_F without a space.

2.11.2 Temperatures between -9°C and +9°C shall be preceded by O; temperatures below 0°C shall be preceded by the letter M, that is minus.

2.11.3 Forecast temperature group(s), normally not exceeding four, shall appear in sequence at the end of the report.

2.12 AMENDED AERODROME FORECAST

An amended aerodrome forecast in code form shall be identified by the use of the prefix TAF AMD in place of TAF, and it shall cover the whole remaining valid period of the original TAF.

CHAPTER 3

ARFOR - Area forecast for aviation

CODE FORM:

ARFOR YYGGggZ $Y_1Y_1G_1G_1G_2G_2$ { KMH or / KT or / MPS }

SECTION 1

AAAAA (VVVV) ($w_1w_1w_1$) ($N_sN_sN_sh_sh_sh_s$ or $VVh_sh_sh_s$ or SKC (or NSC))

$7h_th_th_th_th_th_t$ $6I_ch_ih_ih_it_L$ $5Bh_Bh_Bh_Bt_L$

($4h_xh_xh_xT_hT_h$ $d_hd_hf_hf_hf_h$) ($Zh`_ph`_pT_pT_p$)

SECTION 2 (11111 $QL_aL_aL_oL_o$ $h`_jh`_jf_jf_jf_j$)

SECTION 3 (22222 $h`_mh`_mf_mf_mf_m$ (d_md_mvv))

SECTION 4 $9I_3nnn$

NOTES:

(1) ARFOR is the name of the code for an aviation forecast in figure code prepared for a specific area.

(2) See Notes (2) and (3) under Chapter 2: TAF -Aerodrome Forecast.

(3) The code form is divided into four sections as follows:

Section Number Symbolic Figure Group Contents

1 - Code identification and time groups; area forecast

2 11111 Jet-stream data (optional)

3 22222 Data of maximum wind and vertical wind shear (optional)

4 - Supplementary phenomena

Sections 2, 3 and 4 are not transmitted separately.

REGULATIONS:

3.1 SECTION 1

3.1. l The code name ARFOR shall appear as a prefix to individual coded area forecasts, followed by the group YYGGggZ.

NOTE: *See Regulation 2.1.2.*

3.1.2.1 The forecast shall be considered valid between the hours G_1G_1 and G_2G_2 at all points in the area forecast.

3.1.2.2 The group $Y_1Y_1G_1G_1G_2G_2$ shall be immediately followed, without a space, by the unit of wind speed used and indicated by one of the letter code indicators KMH, KT or MPS, as the case maybe.

NOTES:

(1) KMH, KT and MPS are the standard ICAO abbreviations for kilometres per hour, knots and metres per second, respectively.

(2) The unit of wind speed used in Namibia is knots.

3.1.3 Regulations 2.1.3 and 2.1.4 shall apply.

3.1.4 Group AAAAA

If, instead of plain language, a code is used for AAAAA, this code shall be subject to regional agreements.

3.1.5 Group (VVVV)

3.1.5.1 This group shall be omitted when visibility is not forecast.

3.1.5.2 Regulation 2.4 shall apply.

3.1.6 Group ($w_1w_1w_1$)

3.1.6.1 This group shall be used when any of the following phenomena are forecast: tropical cyclone, severe line squall, hail, thunderstorm, marked mountain waves, widespread sandstorm or duststorm, or freezing rain.

3.1.6.2 When corresponding equivalents in the form of letter abbreviations (Addendum 4: $w_1w_1w_1$ - FORECAST WEATHER) are added in accordance with regional air navigation agreements, the letter abbreviations shall immediately follow the $w_1w_1w_1$ figures without the insertion of any space.

($N_sN_sN_sh_sh_sh_s$ or $VVh_sh_sh_s$ or SKC (or NSC))

3.1.8 Group $7h_th_th_th_th_th_t$

Regulations 2.6.1 and 2.6.3 inclusive shall apply.

3.1.8.1 When the heights above mean sea-level of both the base and top of a number of layers are forecast, the cloud and 7-groups shall be used in pairs for each layer.

3.1.8.2 When the 0°C isotherm is forecast but no forecast is made for top of clouds, the 7-group shall have the form $7///h_th_th_t$. If two cloud groups are given but only one 0°C isotherm is forecast, the order of the groups shall be cloud group, 7-group, cloud group, 7-group, as indicated in 3.1.8.1, and the second 7-group shall be given as $7h_th_th_t///$. If one cloud group and two 0°C isotherms are forecast, the groups shall be given as cloud group, 7-group, 7-group, with the second 7-group given as $7///h_th_th_t$.

3.1.9 Group $6I_ch_ih_ih_it_L$

Regulations 2.9.1 and 2.9.2 shall apply.

3.1.10 Group $5Bh_Bh_Bh_Bt_L$

Regulation 2.10 shall apply.

3.1.11 Groups ($4h_xh_xh_xT_hT_hd_hd_hf_hf_hf_h$)

Refer to Addendum 20.

These groups shall always be used together and repeated for each level for which temperature and wind is forecast.

3.1.12 Group ($2h`_ph`_pT_pT_p$)

Refer to Addendum 20.

This group shall be omitted when tropopause data are not forecast.

3.2 SECTION 2

3.2.1 Section 2 shall be omitted when jet-stream data are not forecast.

3.22 The groups $QL_aL_aL_oL_oh`_jh`_jf_jf_jf_j$ shall be repeated as often as necessary to indicate the position of the jet core and the wind to be encountered in the core of a jet which extends through a large portion of the area or through several zones. Refer to Addendum 20.

3.3 SECTION 3

3.3.1 When the maximum wind is forecast but no forecast is made for the vertical wind shear, the last group of the section shall have the form d_md_m//.

3.3.2 When only information for vertical wind shear is to be provided, the group $h`_mh`_mf_mf_mf_m$ is omitted from the coded forecast and the group $d_md_m$vv shall have the form //vv. Refer to Addendum 20.

3.4 SECTION 4 - GROUP $9I_3nnn$

3.4.1 NOTE: *Addendum 5 applies paragraphs from 3.4.1 to 3.4.3.*

The groups $91P_2P_2P_2$, $92F_tL_aL_a$, $93F_tL_oL_o$, $94F_tGG$, if required, shall always be placed at the end of the relevant part of the message. The groups $92F_tL_aL_a$, $93F_tL_oL_o$, $94F_tGG$ shall only be used to indicate the type of front, together with the position or time of passage. The type of weather during the frontal passage shall be indicated separately, e.g. by separating the forecasts into different periods, or by using the groups $96GGG_p$, and $97GGG_p$, or by a combination of both methods.

3.4.2 A forecast shall cover the period extending from G_1G_1 to G_2G_2. A change group $96GGG_p$ or $97GGG_p$ shall be introduced when a change in some or all of the elements forecast is expected to occur at some intermediate time GG. Such a change group shall not be introduced until all the data groups necessary to describe the elements forecast in the period G_1G_1 to GG have been given. The change group shall be followed by a description of all the elements for which a change is forecast during the period G_p beginning at GG. When an element is not described in the data groups which follow the change group, the description of this element for the period between

G_1G_1 and GG shall be considered to remain valid. When a group $96GGG_p$ is used, the conditions described in the data groups which follow shall be considered to remain valid after the expiration of the time G_p. When necessary, a second change group referring to conditions at a later time GG shall be used.

NOTE: *Plain-language equivalents which are used for the change group $9i_3nnn$, in accordance with regional air navigation agreements, shall be those specified in Addendum 5.*

3.4.3 Group $96GGG_p$

3.4.3.1 The group $96GGG_p$, with GP set to zero (96GG0), shall be used to indicate the beginning of a self-contained part of the forecast indicated by GG. In this case, all forecast conditions given before the group 96GG0 are superseded by the conditions indicated after the group.

3.4.3.2 The group $96GGG_p$, with G_p coded 1 to 4, shall be used to indicate a change in forecast meteorological conditions expected to occur at either a regular or irregular rate at an unspecified time within the period beginning at GG and indicated by G_p. The duration of the period G_p shall normally nor exceed two hours and in any case shall not exceed four hours.

3.4.4 Group $97GGG_p$

The group $97GGG_p$ with GP coded 1 to 9, shall be used to indicate frequent or infrequent temporary fluctuations to forecast meteorological conditions which are expected to last less than one hour in each instance and, in the aggregate cover, less than half of the period indicated by G_p. If there is a requirement for G_p greater than GG plus nine hours the fore period shall be divided.

NOTES:
(1) If the modified forecast condition is expected to last one hour or more, Regulation 3.4.3.1 or 3.4.3.2 applies, i.e. the change group $96GGG_p$ must be used at the beginning and end of the period during which conditions are expected to depart from those forecast prior to GG.

(2) To keep forecast clear and unambiguous. the use of change indicators should be carefully considered and kept to a minimum. In particular, the overlapping of change periods should be avoided. At any time during the validity of the ARFOR, only one possible variation to the prevailing forecast conditions should normally be indicated. The subdivision of the forecast period by 96GG0 should be used to avoid too complex forecasts in cases where many significant changes to weather conditions are expected to occur throughout the forecast period.

3.4.5 If there is a requirement for G_p greater than GG plus nine hours, the forecast period shall be divided.

3.4.6 Group 9999C_2

3.4.6.1 The group 9999C_2 shall be used to indicate the probability of either the occurrence of an alternative value of a forecast element or the occurrence of temporary fluctuations.

NOTE: *A probability of less than 30% of actual values deviating from those forecast is not considered to justify the use of the group 9999C_2. When the possibility of an alternative value is 50% or more, this should be indicated by the use of a group 96GGG$_p$ as appropriate.*

3.4.6.2 When used to indicate the probability of occurrence of an alternative value of a forecast element, the group 9999C_2 shall be followed immediately by an associated time group 99GGG$_p$. The groups 9999C_2 99GGG$_p$, directly placed after the forecast element concerned, shall be followed immediately by the alternative value of that element.

NOTE: *See Regulation 3.4.7.*

3.4.6.3 When used to indicate the probability of occurrence of temporary fluctuations, the group 9999C_2 shall be placed immediately before the change group 97GGG$_p$.

3.4.6.4 The group 9999C_2 shall not be used in combination with the change group 96GG$_p$.

3.4.7 Group 99GGG$_p$

The group 99GGG$_p$ used in combination with the probability group 9999C_2, shall indicate the time period G$_p$ beginning at GG that the alternative value of a forecast element may occur.

3.4.8 Plain-language equivalents which are used for change group 9i$_3$nnn, in accordance with regional air navigation agreements, shall be those specified in Addendum 5. (In Namibia plain language equivalents are used.)

3.5 AMENDED AREA FORECAST

An amended area forecast in code form shall be identified by the use of the prefix ARFOR AMD in place of ARFOR, and it shall cover the whole remaining validity period of the original ARFOR.

CHAPTER 4

ROFOR - Route forecast for aviation

CODE FORM:

SECTION 1

ROFOR YYGGggz $Y_1Y_1G_1G_1G_2G_2$ { KMH or / KT or / MPS }

CCCC ($QL_aL_aL_oL_o$) CCCC $0i_2zzz$

(VVVV) ($w_1w_1w_1$) $N_sN_sN_sh_sh_sh_s$

$7h_th_th_th_th_th_t$ $6I_ch_ih_ih_it_L$ $5Bh_Bh_Bh_Bt_L$

SECTION 2 (11111 $QL_aL_aL_oL_o$ $h`_jh`_jf_jf_jf_j$)

SECTION 3 (22222 $h`_mh`_mf_mf_mf_m$ (d_md_mvv))

SECTION 4 $9I_3nnn$

NOTES:

(1) ROFOR is the name of the code for an aviation forecast in figure code prepared for a route between two specified aerodromes.

(2) See Notes (2) and (3) under Chapter 2: TAF -Aerodrome Forecast.

(3) The code form is divided into four sections as follows:

Section number Symbolic figure group Contents

1 - Code identification and time groups; route forecast
2 - 11111 Jet-stream data (optional)
3 - 22222 Data of maximum wind-and vertical wind shear (optional)
4 - Supplementary phenomena

Sections 2, 3 and 4 are not transmitted separately.

REGULATIONS:

4.1 SECTION 1

4.1.1 The code name **ROFOR** shall appear as a prefix to individual coded route forecasts. followed by the group YYGGggZ.

NOTE: *see Regulation 2.1.2.*

4.1.2 The forecast shall be considered as valid between the hours G_1G_1 and G_2G_2 at all points or in all sections along the route.

4.1.3 The group $Y_1Y_1G_1G_1G_2G_2$ shall be immediately followed, with a space, by the unit of wind speed used and indicated by one of the letter code indicators KMH, KT or MPS, as the case may be.

NOTES:
(1) KMH, KT and MPS are the standard ICAO abbreviations for kilometres per hour, knots and metres per second, respectively.

(2) The unit of wind speed used in Namibia is knots.

4.1.4 Regulations 2.1.3 and 2.1.4 shall apply.

4.1.5 In describing forecast conditions, one of the two following methods shall be used:

(a) By dividing the route into sections (i_2 = 0 to 5 inclusive) and giving the details of conditions expected during the period over the extent of each section. Five-degree zones (i_2 = 5) may be combined if weather elements are sufficiently uniform;

(b) By selecting series of points along the route (i_2 = 6 to 9 inclusive) and forecasting the conditions at these points. Sufficient points must be selected to provide an adequate sampling of the various weather and wind conditions expected along the route.

4.1.6 Route designation

4.1.6.1 The route to which the forecast applies shall be given by the international four-letter location indicators CCCC of the aerodromes at either end of the route. Where it is desirable to · specify the route in greater detail, group(s) $QL_aL_aL_oL_o$ shall be included between CCCC groups to identify a sufficient number of additional points.

4.1.6.2 The forecast detail shall be given starting from the aerodrome of departure indicated by the first CCCC group.

4.1.6.3 The group $0i_2zzz$ shall be used at the beginning of the forecast for each section or point.

4.1.6.4 Regulation 2.2.1 shall apply.

4.1.7 Forecast elements

Regulations 3.1.5 to 3.1.12 inclusive shall apply.

4.2 SECTION 2

Regulations 3.2.1 and 3.2.2 shall apply.

4.3 SECTION 3

Regulations 3.3.1 and 3.3.2 shall apply.

4.4 SECTION 4 -GROUP $9i_3nnn$

4.4.1 Regulation 3.4.1 shall apply.

4.4.2 In addition to Regulation 3.4, the groups 951//, $9552L_aL_a$, $954L_oL_o$, $955L_oL_o$, or the corresponding plain-language alternative terminology (Addendum 5: i_3 – nnn), shall be used if it is necessary to indicate changes along the route.

4.4.3 Regulations 3.4.2 to 3.4.8 inclusive shall apply.

4.5 AMENDED ROUTE FORECAST

An amended route forecast in code form shall be identified by the use of the prefix ROFOR AMD in place of ROFOR, and it shall cover the whole remaining validity period of the original ROFOR.

CHAPTER 5

SAFOR - FIXED TIME AREA FORECAST FOR DOMESTIC USE ONLY

CODE FORM:

SAFOR CCCC YYGG AAAAA (VVVV) (LOC)W`W` (LOC) $N_sN_sN_sCCh_sh_sh_sh_th_th_t$ BBBB

5.1 SAFOR is the name of the code for a fixed time area forecast for domestic use.

The code name SAFOR shall appear as a prefix to individual code route forecasts, followed by the Group CCCC.

5.2 CCCC ICAO location indicator of station responsible for compilation of message.

5.3 YYGG See Addendum 20.

5.4 AAAAA See Addendum 20.

5.5 VVVV See Addendum 20.

5.6 LOC Local variations of visibility may be described, using the expressions given in Addendum 5.

5.6.1 W'W' See Addendum 20.

5.7 LOC Local variations of cloud may be described using the expressions given in Addendum 5.

5.8.1 $N_sN_sN_s$ Expected cloud amount (Regulation 2.6.1.1)

CC Genus of cloud.

may be repeated as often as necessary

$h_sh_sh_s$ Expected cloud base (Addendum 9).

$h_th_th_t$ Expected cloud tops (Addendum 9).

BBBB Plain language additional information.

ISOL Isolated

Used with CB cloud only

OCNL Occasional
FRQ Frequent

CHAPTER 6

AMDAR-Aircraft report (aircraft meteorological data relay)

CODE FORM:

SECTION 1 AMDAR YYGG

SECTION 2 $i_p i_p i_p$ $I_A \ldots I_A$ $L_a L_a L_a L_a A$ $L_o L_o L_o L_o L_o B$ YYGGgg $S_h h_l h_l h_l$

$SST_A T_A T_A$ { $SST_d T_d T_d$ / or / UUU } ddd/fff TBB_A $Ss_1 s_2 s_3$

SECTION 3 333 $Fh_d h_d h_d$ $VGf_g f_g f_g$

NOTES:

(1) AMDAR is the name of the code for an automatic meteorological report from an aircraft.

(2) Observations are made at specified levels, time intervals or when the highest wind is encountered, and shall be included in individual reports.

(3) Data transmitted from the aircraft are encoded in binary code and are translated into quasi-AIREP format for the convenience of human users.

REGULATIONS:

6.1 GENERAL

6.1.1 In a bulletin of AMDAR reports, the contents of Section l (the code name AMDAR and the group YYGG) shall be included only as the first line of the bulletin.

6.1.2 Reporting data groups

6.1.2.1 Subject to Regulation 6.1.2.2, an AMDAR report shall include Section 2 containing at least the phase of flight indicator, the aircraft identifier, its geographical location and the time of observation, as well as the observed temperature and wind.

6.1.2.2 An AMDAR report from an ASDAR system shall include all data groups contained in Section 2 and shall not include Section 3.

6.1.2.3 An AMDAR report from an ACARS system shall include Section 3.

6.1.2.4 Use of solidi:

Data shall be encoded as solidi when not available, when the data collection platform cannot acquire correct data, or in the event of parity errors.

6.1.3 Frequency of observations

The frequency of observations shall vary according to the phase of the flight (ascent, level flight or descent).

6.1.3.1 Observations during ascent

During ascent, observations shall be made as the aircraft passes through certain pressure levels, as follows. The first level shall be the nearest multiple of 10 hPa less than pressure at take-off. The next nine observations shall be at intervals of 10 hPa. The eleventh level shall be the first multiple of 50 hPa less than the tenth level. Observations shall continue at 50-hPa intervals until ascent is completed.

NOTE: *For example, if the pressure at take-off was 1012 hPa, the first level to be reported would be 1010 hPa.*

6.1.3.2 Observations during level flight

(i) Routine observations

Routine observations during level flight shall be made at set intervals of time. The first observation shall be made at the first integral minute after the level flight phase has been continuously occupied for at least 15 seconds. Subsequent observations shall be made at 7-minute intervals. If level flight is interrupted by unsteady flight, the timing sequence shall begin again upon resumption of level flight.

(ii) Highest wind encountered

Highest wind encountered shall be reported when the aircraft is in level flight at a pressure level less than 600 hPa, according to the following scheme. Smoothed wind speed shall be sampled at one-second intervals, and a wind speed maximum shall be reported if and only if the wind speed:

(a) Is greater than 60 knots;

(b) Exceeds the observed wind speed at the previous routine observation by 10 knots or more; and

(c) Exceeds the observed wind speed at the subsequent routine observation by 10 knots or more.

6.1.3.3 Observations during descent

During descent observations shall be made as the aircraft passes through certain pressure levels, as follows. The first level shall be the nearest multiple of 50 hPa greater than the pressure at the last observation before descent. Subsequent observations shall be at intervals of 50 hPa, until a pressure level of 700 hPa is reached. From that level, observations shall continue at 50-hPa intervals, but supplemented by observations at intervals of 10 hPa.

6.2 SECTION 2

6.2.1 Phase of flight indicator $i_p i_p i_p$

6.2.1.1 An indicator shall be included in each report, to show both phase of flight (unsteady, level, ascent or descent) and, in the case of level flight, the type of observation (routine or maximum wind).

6.2.1.2 Whenever a predetermined roll threshold has been exceeded, the phase of flight shall be considered to be unsteady and no information shall be transmitted by the AMDAR unit.

6.2.1.3 A routine observation in level flight shall be indicated by encoding the phase of flight indicator LVR.

6.2.1.4 Highest wind encountered in level flight shall be indicated by encoding the phase of flight indicator as LVW.

6.2.1.5 An observation during descent shall be indicated by encoding the phase of flight indicator as DES.

6.2.2 Meteorological data

6.2.2.1 Temperature

Each observation shall include the air temperature at the given pressure altitude. The precision of the temperature shall be indicated by s_3. If observed, either dew-point temperature or relative humidity at the given pressure altitude shall be included.

6.2.2.2 Wind

Each observation shall include a value for the observed wind. Direction, relative to true north, shall be reported in whole degrees. Wind speed shall be reported in whole knots.

6.2.2.3 Turbulence

Each observation from an ASDAR system shall include a report of turbulence, encoded by the indicator letters TB followed by a single digit value for the turbulence.

6.3 SECTION 3

6.3.1 Group $Fh_dh_dh_d$
This group shall be used in an AMDAR report from an ACARS system to report the pressure altitude.

NOTE. Reports up to and including 700 hPa are considered to be above the aerodrome with height derived from the QNH value and the elevation of the aerodrome concerned. Heights above 700 hPa are included in accordance with the ICAO standard atmosphere.

6.3.2 Group $VPf_gf_gf_g$

This group shall be used in an amdar report from an ACARS system to report the maximum derived equivalent vertical gust.

NOTES:

(1) The qualitative severity of turbulence can be related approximately to values of derived equivalent gust velocity as follows:
U_{de} m s^{-1} 2-4.5 m s^{-1} 4.5-9 m s^{-1} 9 m s^{-1}
Severity Nil Light Heavy Severe

(2) The derived equivalent vertical gust, $U_{de'}$ is defined by aircraft design codes such as the US Federal Aviation Regulations - Part 25.341, or the Engineering Sciences Data Unit (London, United Kingdom) - Data Item 69023.

CHAPTER 7

SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS

7.1 SIGMET INFORMATION - GENERAL PROVISIONS

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

be indicated using one of the following as appropriate:

(a) at subsonic cruising levels:

Thunderstorm

- obscured OBSC TS

- embedded EMBD TS

- frequent FRQ TS

- line squall LSQ TS

- obscured with heavy hail OBSC TS HVYGR

- embedded with heavy hail EMBD TS HVYGR

- frequent, with heavy hail FRQ TS HVYGR

- line squall with heavy hail LSQ TS HVYGR

tropical cyclone

- tropical cyclone with 10 minute
mean surface wind speed of
63 km/h (34 kt) or more TC (+ cyclone name)

Turbulence

- severe turbulence SEV TURB

Icing

- severe icing SEV ICE

- severe icing due to freezing rain SEY ICE (FZRA)

mountain wave

- severe mountain wave SEV M1W

Duststorm

- heavy duststorm HVY DS

Sandstorm

- heavy sandstorm HVY SS

volcanic ash

- volcanic ash VA (+ volcano name)

- Surface temperature inversion INVER

(b) at transonic levels and supersonic cruising levels:

turbulence

- moderate turbulence MOD TURB

- severe turbulence SEV TURB

cumulonimbus

- isolated cumulonimbus ISOL CB

- occasional cumulonimbus OCNL CB

- frequent cumulonimbus FRQ CB

Hail

-hail GR

volcanic ash

- volcanic ash VA (+ volcano name, if known)

NOTE: *Guidance on the preparation of SIGMET messages is given in Attachment F.*

7.1.2 SIGMET information shall not contain unnecessary descriptive material. In describing the weather phenomena for which the SIGMET is issued. no descriptive material additional to that given in 7.1.1 shall be included. SIGMET information concerning thunderstorms or a tropical cyclone shall not include references to associated turbulence and icing. However, the occurrence

of heavy hail with thunderstorm shall be indicated.

7.1.3 SIGMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area.

7.2 FORMAT AND EXCHANGE OF SIGMET MESSAGES

7.2.1 A SIGMET message shall contain the following information as necessary and in the order indicated:

(a) location indicator of the air traffic services unit serving the flight information region or control area to which the SIGMET message refers; for example, "YUCC";

NOTE: In cases where the airspace is divided into a flight information region (FIR) and an upper flight information region (UIR), the SIGMET is identified by the location indicator of the air traffic services unit serving the FIR; nevertheless, the SIGMET message applies to the whole airspace within the lateral limits of the FIR, i.e. to the FIR and to the UIR. The particular areas and/or flight levels affected by the meteorological phenomena causing the issuance of the SIGMET are given in the text of the message.

(b) message identification and sequence number; for example, "SIGMET 5";

EXAMPLE OF SIGMET MESSAGE:

YUCC SIGMET 5 VALID 221215/221600 YUDO-

AMSWELL FIR SEV TIJRB OBS AT 1210 YUSB FL250 MOVE 40 KMH WKN

Meaning: The fifth SIGMET message issued for the AMSWELL * flight information region (identified in abbreviated plain language and by yucc Amswelll area control centre) by the Donlon/International* meteorological watch office (YUDO) since 0001 UTC; the message is valid from 1215 UTC to 1600 UTC over Siby/Bistock* aerodrome (YUSB) at flight level 250; the turbulence is expected to move eastwards at 40 kilometres per hour and to weaken in intensity.

* Fictious locations

NOTE: *The sequence of SIGMET messages may be indicated by figures or a combination of figures and letters.*

(c) date-time groups indicating the period of validity in UTC, for example, "VALlD 221215/221600";

(d) location indicator of the meteorological watch office originating the message followed by a hyphen to separate the preamble from the text; for example, "YUDO-";

(e) on the next line, name of the flight information region or control area for which the SIGMET is issued for example "AMSWELL FIR";

(f) phenomenon and description of the phenomenon causing the issuance of the SIGMET taken, as appropriate, from the list given in 7.1.l, for example, "FRQ TS";

(g) indication whether the information is observed and expected to continue, using the abbreviation "OBS" and where relevant the time of observation in UTC, or forecast using the abbreviation "FCST";

(h) location (referring where possible, to latitude and longitude and/or locations or geographic features well known internationally) and level; for example, "FCST TOPS FL390 S OF 54 DEGN" or "SIBY/BISTOK AT FL250";

(i) movement or expected movement with reference to one of the eight points of compass given in kilometres per hour or knots or stationary; for example, "MOVE 40 KMH";

(j) changes in intensity; using, as appropriate, the abbreviations "INTSF", "WKN" or "NC";

(k) on the next line, an outlook providing information beyond the period of validity specified under c) above, of the trajectory of the volcanic ash cloud and positions of the tropical cyclone centre, for example:

YUCC SIGMET 3 VALID 251600/252200 YUDO-

AMSWELL FIR TC GLORIA OBS 27. lN 73. lW AT 1600 UTC FRQ TS TOPS FL500 WI 150
NM OF CENTRE, MOV NW 1OKT.NC.

OTLK TC CENTRE 260400 28.5N 74.5W 261000 31.0N 76.0W.

7.2.2 SIGMET messages shall be prepared in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature supplemented, if suitable approved abbreviations are not available, by the vocabulary of a national language, taken with its usual meaning in aviation.

7.2.3 Messages containing SIGMET information for subsonic aircraft shall be identified as "SIGMET", those containing SIGMET information for supersonic aircraft during transonic or supersonic flight shall be identified as "SIGMET SST".

7.2.4 The sequence number referred to in 7.2.1 b) shall correspond with the number of SIGMET messages issued for the flight information region since 0001 UTC on the day concerned. Separate series of sequence numbers shall be used for "SIGMET" and "SIGMET SST" messages.

7.2.5 Recommendation: The period of validity of a SIGMET message should be not more than 6 hours, and preferably not more than 4 hours. It should be indicated by the term "VALID" followed by the date-time groups indicating the beginning and the end of that period in six figures each, separated by"/"; for example, a period of validity from 1215 UTC to 1600 UTC on the 22nd day of the month should be given as "VALID 221215/221600".

7.2.6 Recommendation: In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, an outlook should be included giving information for up to 12 hours beyond the period of validity specified in 7.2.5, concerning the trajectory of the volcanic ash cloud and positions of the tropical cyclone centre.

7.2.7 Recommendation: The outlook included in SIGMET messages in accordance with 7.2.6 concerning volcanic ash cloud and tropical cyclones should be based, where possible. on advisory information provided by meteorological centres designated by regional air navigation agreement.

7.2.8 Recommendation: A SIGMET message relating to the expected occurrence of weather phenomena listed in 7.1.1 with the exception of volcanic ash cloud and tropical cyclones, should be issued not more than 6 hours, and preferably not more than 4 hours, before the expected time of occurrence of that phenomenon. SIGMET messages concerning volcanic ash cloud or tropical cyclones expected to affect a flight information region should be issued up to 12 hours before the commencement of the period of validity or as soon as practicable if such advance warning of the existence of these phenomena is not available. SIGMET messages for volcanic ash and tropical cyclones should be updated at least every 6 hours.

7.2.9 Recommendation: SIGMET messages should be disseminated to meteorological watch offices, central forecast office and to other meteorological offices. in accordance with regional air navigation agreement.

7.3 AREA FORECAST FOR LOW-LEVEL FLIGHTS TO SUPPORT ISSUANCE OF AIRMET INFORMATION

7.3.1 When the density of traffic operating below flight level 100 warrants the issuance of AIRMET information in accordance with 7.4.1 area forecasts for such operations shall be; exchanged between meteorological offices responsible for the issuance of flight documentation for low-level flights in the flight information regions concerned.

7.3.2 Area forecasts for low-level flights exchanged between meteorological offices in support of the issuance of AIRMET information shall be prepared in a format agreed upon between the meteorological authorities concerned. When abbreviated plain language is used, the forecast shall be prepared as a GAMET area forecast, employing approved ICAO abbreviations and numerical values. The area forecasts shall be issued to cover the layer between the ground and flight level 100 (or up to flight level 150 in mountainous areas) and shall contain information on en-route weather phenomena hazardous to low-level flights. The area forecasts shall contain the following information as necessary and, when prepared in GAMET format, in the order indicated:

(a) location indicator of the air traffic services unit serving the flight information region(s) to which the area forecast for low-level flights refers; for example, "YUCC";

(b) message identification using the abbreviation "GAMET";

(c) data-time groups indicating the period of validity in UTC; for example, "VALID 220600/221200";

(d) location indicator of the meteorological office originating the message, followed by a hyphen to separate the preamble from the text; for example, "YUDO-";

(e) on the nest line, name of the flight information region, or a sub-area thereof, for which the area forecast for low-level flights is issued; for example, "AMSWELL FIR/2";

(f) widespread mean surface wind speed exceeding 60 km/h (30 kt); for example, "SFC WSPD: 10/12 65 KMH";

(g) widespread areas of surface visibility below 5 000 m; for example, "SFCVIS: 06/08 N OF 51 DEG N 3000 M";

(h) significant weather, i.e. thunderstorms and heavy sand- and duststorm (except for phenomena for which a SIGMET message has already been issued); for example, "SIGWX: 11/12 ISOL TS";

(i) mountain obscuration; for example, "MT OBSC: MT PASSES S OF 48 DEG N OBSC";

(j) widespread areas of broken or overcast cloud with height of base less than 300 m (1 000 ft) above ground level and/or occurrence of cumulonimbus (CB) clouds without thunderstorm: for example, "CLD: 06/09 OVC 800 FT N OF 51 DEG N";

(k) icing (except for that occurring in convective clouds and for severe icing for which a SIGMET message has already been issued); for example, "ICE: MOD FL050/080";

(l) turbulence (except for that occurring in convective clouds and for severe turbulence for which a SIGMET message has already been issued); for example, "TUR; MOD ABV FL090";

(m) mountain wave (except for severe mountain wave for which a SIGMET message has already been issued); for example, "MTW: MOD ABV FL080 E OF 63 DEG N";

(n) SIGMET messages applicable to the FIR concerned or the sub-area thereof, for which the area forecast is valid; for example, "SIGMET APPLICABLE: 3,5".

Each of the items f) to n) shall, when applicable, be included in the GAMET area forecast beginning on a new line. Items for which no hazardous phenomenon is expected to occur, or which are already covered by a SIGMET message, shall be omitted from the area forecast. When

no weather phenomena hazardous to low-level flights occur and no SIGMET information is applicable, the term "HAZARDOUS WX NIL" shall replace all items listed under f) to n). When a weather phenomenon hazardous to low-level flights has been included in the GAMET area forecast and the phenomenon forecast does not occur, or is no longer forecast, a GAMET AMD shall be issued, amending only the weather element concerned.

NOTE: *Specifications regarding the issuance of AIRMET information amending the area forecast in respect of weather phenomena hazardous for low-level flights are given in paragraph 7.4.1.*

7.3.3 Area forecasts for low-level flights exchanged between meteorological offices in support of the issuance of AIRMET information shall be issued every 6 hours for a period of validity of 6 hours and transmitted to meteorological offices concerned not later than one hour prior to the beginning of their validity period.

7.4 AIRMET INFORMATION

7.4.1 AIRMET information shall be issued by a meteorological watch office in accordance with regional air navigation agreement, taking into account the density of air traffic operating below flight level 100. AIRMET information shall give a concise description in abbreviated plain language concerning the occurrence and/or expected occurrence of specified en-route weather phenomena, whi.ch have not been included in the area forecast for low-level flights issued in accordance with Section 7.3 and which may affect the safety of low-level flights, and of the development of those phenomena in time and space. The information shall be indicated using one of the following as appropriate:

At cruising levels below flight level 100 (or below flight level 150 in mountainous areas):

surface wind speed

- widespread mean surface wind speed above 60 km/h (30 kt)
SFC WSPD (+ wind speed and units)

surface visibility

- widespread areas affected by reduction of visibility to less than 5 000 m
SFC VIS (+visibility)

Thunderstorms

- isolated thunderstorms without hail

ISOL TS

- occasional thunderstorms without hail

OCNL TS

- isolated thunderstorms with hail

ISOL TSGR

- occasional thunderstorms with hail

OCNL TSGR

mountain obscuration

- mountains obscured

MT OBSC

cloud

- widespread areas of broken or overcast cloud with height of base less than 300 m (1 000 ft) above ground level:

broken

BKN CLD (+ height of the base and units)

Overcast

OVC CLD (+ height of the base and units)- cumulonimbus clouds without thunderstorm which are:

isolated ISOL CB

occasional OCNL CB

frequent FRQ CB

icing

- moderate icing (except for icing in convective clouds)

MOD ICE

Turbulence

- moderate turbulence (except for turbulence in convective clouds)

MOD TURB

mountain wave

- moderate mountain wave

MOD MTW

NOTE: *Guidance on the preparation of AIRMET messages is given in Attachment F.*

7.4.2 AIRMET information shall not contain unnecessary descriptive material. In describing the weather phenomena for which the AIRMET is issued, no descriptive material additional to that given in 7.4.1 shall be included. AIRMET information concerning thunderstorms or cumulonimbus clouds shall not include references to associated turbulence and icing. However, the occurrence of hail with thunderstorms shall be indicated.

NOTE: The specifications for SIGMET information which is also applicable to low-level flights are given in paragraph 7.1.1.

7.4.3 AIRMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area.

7.5 FORMAT AND EXCHANGE OF AIRMET MESSAGES

7.5.1 An AIRMET message shall contain the following information, as necessary, and in the order indicated:

(a) location indicator of the air traffic services unit serving the flight information region or control area to which the AIRMET message refers; for example, "YUCC";

(b) message identification and sequence number; for example, "AIRMET 2";

(c) date-time groups indicating the period of validity in UTC; for example, "VALID 221215/221600";

(d) location indicator of the meteorological watch office originating the message followed by a hyphen to separate the preamble from the text; for example, "YUDO-";

(e) on the next line, name of the flight information region or a sub-area thereof for which the AIRMET is issued; for example, "AMSWELL FIR";

(f) phenomenon and description of the phenomenon causing the issuance of the AIRMET taken, as appropriate, from the list given in 7,4, l; for example, "MOD MTW";

(g) indication whether the information is observed and expected to continue, using the abbreviation "OBS" and where relevant the time of observation in UTC, or forecast using the abbreviation "FCST";

(h) location (referring where possible, to latitude and longitude and/or locations or geographic features well known internationally) and level; for example, "OBS 48 DEG N 10 DEG E AT FL080";

(i) movement or expected movement with reference to one of the eight points of compass given in kilometres per hour or knots, or stationary; for example, "STNR";

j) changes in intensity; using, as appropriate, the abbreviations "INTSF", "WKN" or "NC".

7.5.2 AIRMET messages shall be prepared in abbreviated plain language, using approved ICAO abbreviations and numerical values.

7.5.3 The sequence number referred to in 7.5.1 b) shall correspond with the number of AIRMET messages issued for the flight information region since 0001 UTC on the day concerned.

7.5.4 **Recommendation:** The period of validity of an AIRMET message should be not more than 6 hours, and preferably not more than 4 hours. It should be indicated by the term "VALID" followed by date-time groups indicating the beginning and the end of that period in six figures each, separated by"/"; for example, a period of validity from 1215 UTC to 1600 OTC on the 22nd day of the month should be given as "VALID 221215/221600".

7.5.5 **Recommendation:** AIRMET messages should be disseminated to meteorological watch offices in adjacent flight information regions and to other meteorological offices, as agreed by the meteorological authorities concerned.

EXAMPLE OF AIRMET MESSAGE

YUCC AIRMET 2 VALID 221215/221600 YUDO-

AMSWELL FIR MOD MTW OBS AT 1205 48 DEG N 10 DEG E AT FL080 STNR NC

Meaning: The second AIRMET message issued for the AMSWELL* flight information region (identified in abbreviated plain language and by YUCC Amswell area Control centre) by the Donlon/International* meteorological watch office (YUDO) since 0001 UTC; the message is valid from 1215 UTC to 1600 UTC on the 22nd of the month; moderate mountain wave was observed at 1205 UTC at 48 degrees north and 10 degrees east at flight level 080; the mountain

wave is expected to remain stationary and not to undergo any changes in intensity.

* Fictitious locations

7.6 AERODROME WARNINGS

7.6.1 Aerodrome warnings shall give concise information, in plain language, of meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and the aerodrome facilities and services. The warnings shall be issued in accordance with local arrangements to operators, aerodrome services and to others concerned, by the meteorological office designated to provide service for that aerodrome.

7.6.2 Recommendation: Aerodrome warnings should relate to the occurrence or expected occurrence of one or more of the following phenomena:

- tropical cyclone

- thunderstorm

- hail

- snow

- freezing precipitation

- hoar frost or rime

- sandstorm

- duststorm

- rising sand or dust

- strong surface wind and gusts

- squall

- frost

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

7.7 WIND SHEAR WARNINGS

7.7.1 Wind shear warnings shall give concise information of the observed or expected existence of wind shear which could adversely affect aircraft on the approach path or take-off path or during circling approach between runway level and 500 m (1 600 ft) above that level and aircraft on the runway during the landing roll or take-off run. The warnings shall be prepared and disseminated for aerodromes where wind shear is considered a factor in accordance with local arrangements with the appropriate ATS authority and operators concerned and by the meteorological office designated to provide service for the aerodrome or disseminated directly from automated ground-based wind shear remote sensing or detection equipment referred to in 7.7.2 a) and b). Where local topography has been shown to produce significant wind shears at heights in excess of 500 m (1 600 ft) above runway level than 500 m (1 600 ft) shall not be considered restrictive.

NOTES:

(1) Wind shear conditions are normally associated with the following phenomena:
- thunderstorms, microbursts, funnel cloud (tornado or waterspout), and gust fronts
- frontal surfaces
- strong surface winds coupled with local topography
- sea breeze fronts
- mountain waves (including low-level rotors in the terminal area)
- low-level temperature inversions.

(2) Guidance on the subject of wind shear is contained in the ICAO Circular on Wind Shear (CIRC-186).

(3) Information on wind shear is also to be included as supplementary information in routine, special and selected special reports in accordance with 7.7.3.

7.7.2 **Recommendation:** Evidence of the existence of wind shear should be derived from:

(a) ground-based wind shear remote-sensing equipment, for example, Doppler radar;

(b) ground-based wind shear detection equipment, for example, a system of surface wind and/or pressure sensors located in an array monitoring a specific runway or runways and associated approach and departure paths;

(c) aircraft observations during the climb-out or approach phases of flight

(d) other meteorological information, for example, from appropriate sensors located on existing masts or towers in the vicinity of the aerodrome or nearby areas of high ground.

7.7.3 **Recommendation:** Wind shear warnings should be prepared in abbreviated plain language. Wind shear in the approach area should be reported, for example, as "WS WRNG SURFACE WIND 320/20KMH WIND AT 60M 360/50KMH IN APCH" or "WS WRNG SURFACE WIND 320/10KT WIND AT 60M 360/25KT IN APCH". Where microbursts are observed, reported by pilots or detected by ground-based wind shear detection or remote-sensing equipment, the wind shear warning should include a specific reference to microbursts, for example, "WS WRNG MBST APCH RWY 26".

7.7.4 **Recommendation:** Where information from ground-based wind shear detection or remote-sensing equipment is used to prepare a wind shear warning, the warning should, if practicable, relate to specific sections of the runway and distances along the approach path or take-off path as agreed between the meteorological authority, the appropriate ATS authority and the operators concerned, for example, "WS WRNG 30KT AIRSPEED LOSS 2NM FINAL RWY 13" or "WS WRNG 60KMH AIRSPEED LOSS 4KM FINAL RWY 13".

7.7.5 **Recommendation:** When an aircraft report is used to prepare a wind shear warning, or to confirm a warning previously issued, the corresponding aircraft report, including the aircraft type, should be given unchanged in the warning, for example, "WS WRNG B747 REPORTED MOD WS IN APCHRWY34AT 1510".

NOTES:

(1) Following reported encounters by both arriving and departing aircraft two different wind shear warnings may exist, one for arriving aircraft and one for departing aircraft.

(2) Specifications for reporting the intensity of wind shear are still undergoing development. It is recognized however, that pilots, when reporting wind shear, may use the qualifying terms "moderate", "strong" or "severe", based to a large extent on their subjective assessment of the intensity of the wind shear encountered. In accordance with 7.7.5, such reports are to be incorporated unchanged in wind shear -warnings.

ADDENDUM 1

CRITERIA FOR ISSUING SPECI REPORTS

Criteria for the inclusion of change groups in aerodrome forecasts (TAFs) or for the amendment of aerodrome forecasts.

Reports of special observations indicating changes in accordance with the following criteria shall be prepared as selected special reports:

(a) When the mean surface wind direction has changed by 30" or more from that given in the latest report, the mean speed before and/or after the change being 40 km h^{-1} (20 kt) or more;

(b) When the mean surface wind speed has changed by 20 km h^{-1} (10 kt) or more from that given in the latest report, the mean speed before and/or after the change being 60 km h^{-1} (30 kt) or more;

(c) When the variation from the mean surface wind speed (gusts) has increased by 20 km h^{-1} (10 kt) or more from that given in the latest report, the mean speed before and/or after the change being 30 km h^{-1} (15 kt) or more;

(d) When the visibility changes to or passes:

(i) 1 500 or 3 000 m for SPECI reports and for TAFS 150, 350, 600, 800, 1 500 or 3 000 m;

(ii) 5 000 m, in cases where significant numbers of flights are operated in accordance with the visual flight rules;

(e) When the runway visual range changes to or passes 150, 350, 600 or 800 m;

(f) When a thunderstorm (with or without precipitation), freezing precipitation, freezing fog, moderate or heavy precipitation (including showers thereof), low drifting dust, sand or snow, blowing dust, sand or snow (including snowstorm), duststorm, sandstorm, squall or funnel cloud (tornado or waterspout) begins or ends or changes in intensity;

(g) When the height of base of the lowest cloud layer of BKN or OVC extent, changes to or passes:

(i) 30, 60, 150 or 300 m (100, 200, 500 or l 000 ft)

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

(h) When the amount of cloud below 450 m (1 500 ft) changes:

(i) SKC, FEW or SCT to BKN or OVC; or

(ii) BKN or OVC to SKC, FEW or SCT.

(iii) For SPECs. where the sky is obscured and the vertical visibility changes to or passes through 30, 60, 150 or 300 m (100, 200, 500 or l 000 ft).

(iv) an increase in air temperature of 2°C or more from that given in its latest report.

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

A selected special report representing a deterioration in conditions should be disseminated immediately after the observation. A selected special report representing an improvement in conditions should be disseminated, if necessary, to indicate the conditions prevailing at the end of that 10-minute period. A selected special report representing a deterioration of one weather element and an improvement in another element should be disseminated immediately after the observation.

Recommendation

Selected special reports should be disseminated beyond the aerodrome of origin in accordance with regional air navigation agreement.

ADDENDUM 2

w'w' - SIGNIFICANT PRESENT AND FORECAST WEATHER

QUALIFIER		WEATHER PHENOMENA		
Intensity of Proximity 1	**Descriptor** 2	**Precipitation** 3	**Obscuration** 4	**Other** 5
- Light	MI Shallow	DZ Drizzle	BR Mist	PO Dust/sand whirls (dust devils)
Moderate (no qualifier)	BC Patches	RA Rain	FG Fog	SQ Squalls
+ Heavy (well-developed in the case of dust/sand whirls (dust devils) and funnel clouds	PR Partial (covering part of the aerodrome)	SN Snow	FU Smoke	FC Funnel cloud (s) (tornado or waterspout)
VC In the vicinity	DR Low drifting	SG Snow grains	VA Volcanic ash	SS Sandstorm
	BL Blowing	IC Ice crystals (diamond dust)	DU Widespread dust	DS Duststorm
	SH Shower(s)	PE Ice pellets	SA Sand	
	TS Thunderstorm	GR Hail	HZ Haze	
	FZ Freezing (supercooled)	GS Small hail and/or snow pellets		

The w'w' groups shall be constructed by considering columns 1 to 5 in the table above in sequence, that is intensity, followed by description, followed by weather phenomena. An example could be: +SHRA (heavy shower(s) of rain).

NOTES:

(1) Entries in this code table are based on the descriptions of hydrometeors and lithometeors found in publication WMO-No. 407 -International Cloud Atlas. Volume [(Manual on the observation of clouds and other meteors).

(2) Regulation 1. 7 shall apply.

(3) More than one form of precipitation shall be combined, the dominant type of precipitation being reported first, for example +SNRA.

(4) More than one phenomenon other than a precipitation combination noted shall be reported in separate w 'w' groups in the order of the columns, for example: DZ FG.

(5) Intensity shall be indicated only with precipitation, precipitation associated with showers and/or thunderstorms. blowing dust, sand or snow, duststorm or sandstorm. Well developed dust/sand whirls or funnel clouds (tornadoes or water-spouts) shall be reported using the indicator +, for example +FC.

(6) Not more than one descriptor shall be included in a w'w' group for example, FZDZ.

(7) The descriptors Ml, BC and PR shall be used only in combination with the letter abbreviation FG, for example MIFG.

(8) The descriptor DR (low drifting) shall be used for dust, sand or snow raised by the wind to less than 2 metres above the ground. BL (blowing) shall be used to indicate dust, sand or snow raised by the wind to a height of 2 metres or more above the ground. The descriptors DR and BL shall be used Only in combination with the letter abbreviation DU, SA and SN for example BLSN.

(9) When blowing snow is observed with mow falling from cloud, both phenomena are reported, e.g. SN BLSN. When due to heavy blowing snow the observer cannot determine whether or not snow is also falling from cloud, the only +BLSN shall be reported.

(10) The descriptor SH shall be used only in combination with one or more of the letter abbreviations RA, SN, PE, GS and GR. to indicate precipitation of the shower type at the time of observation, for example SHSN.

(11) The descriptor TS shall be used only in combination with one or more of the letter abbreviations RA. SN, PE, GS and GR, to indicate thunderstorm with precipitation at the aerodrome, for example TSSNGS.

(12) The descriptor FZ shall be used only in combination with the letter abbreviations FG, DZ and RA, for example FZRA.

(13) The proximity qualifier VC shall be used only in combination with the letter abbreviations TS, DS, SS, FG, FC, SH, PO, BLDU, BLSA and BLSN.

ADDENDUM 3

CRITERIA FOR ISSUING TREND-TYPE FORECASTS

WIND

The trend part of the trend-type landing forecast shall indicate changes in the surfaces wind which involve:

(a) A change in the mean wind direction of 30 or more, the mean speed before and/or after the change being 40 km/h (20 kt) or more;

(b) A change in mean wind speed of 20 km/h (10 kt) or more, the mean speed before and/or after the change being 60 km/h (30 kt) or more.

VISIBILITY

When the visibility is expected to change to or pass any of the values 200, 400, 600, 800, l 500 or 3 000 m, the trend part of the trend-type landing forecast shall indicate the change. When significant numbers of flights are conducted in accordance with the visual flight rules, the forecast shall additionally indicate changes to or passing either 5 000 m or 8 000 m, the value of 5 000 or 8 000 m being selected in accordance with the minimum visibility criteria in effect in the State concerned. For example, a temporary reduction of the visibility to 750 min fog shall be rounded down to 700 m and indicated in the form "TEMPO 0700" (MET AR code form).

PRESENT WEATHER

When the onset or cessation of a thunderstorm or freezing precipitation is expected, the trend part of the trend-type landing forecast shall indicate changes. For example, temporary freezing rain shall be indicated in the form "TEMPO FZRA" (MET AR code form). The expected end of occurrence of those phenomena shall be indicated by "NSW". For example, an expected rapid cessation at 1630 UTC of significant weather, such as a thunderstorm, shall be indicated in the form "BECMG AT 1630 NSW" (METAR code form) or "RAPID 1630 WX NIL" (abbreviated plain language).

CLOUD

When the height of the base of cloud covering more than four oktas is below or is expected to fall below or rise above 450 m (1 500 ft), the trend part of the trend-type landing forecast shall indicate changes to or passing any one of the following values: 30, 60, 150, 300 and 450 m (100, 200, 500, 1 000 and 1 500 ft). When the height of the base of cloud is below or is expected to fall below or rise above 450 m (1 500 ft), the trend part of the trend-type landing forecast shall also indicate changes in cloud amount from SKC, FEW or SCT increasing to BKN or OVC or changes from BKN or OVC decreasing to SKC, FEW or SCT. For example, a rapid increase in stratus cloud at 300 m (1 000 ft) at 1130 UTC from SCT to OVC shall be indicated in the form "BECMG AT1130 OVCOIO" (METAR code form) when CAVOK and SKC are not appropriate NSC shall be used. When CAVOK and SKC are not appropriate NSL shall be used.

When the sky is expected to remain or become obscured and vertical visibility observations are available at its aerodrome, the trend part of the trend type landing forecast shall indicate changes in vertical visibility to or passing any one of the following values: 30, 60, 150 or 300 m (100, 200, 500 or l 000 ft).

NOTE: The order of the elements and the terminology. units and scales used in the trend part of the trend-type landing forecast shall be the same as those used in the report to which it is appended.

ADDENDUM 4

$w_1w_1w_1$ – FORECAST WEATHER

Code figure Abbreviation

111 TS Thunderstorm

222 TRS Tropical cyclone

333 LSQ Severe line squall

444 HAIL Hail

555 MTW Marked mountain waves

666 SAND Widespread sandstorm

777 DUST Widespread duststorm

888 FZR Freezing rain

ADDENDUM 5

i_3nnn

i_3 - INDICATOR FOR SUPPLEMENTARY PHENOMENA

nnn - SPECIFICATIONS RELATED TO SUPPLEMENTARY PHENOMENA $9i_3nnn$

$91P_2P_2P_2$ Forecast lowest mean sea pressure

$92F_tL_aL_a$ Type of front and its position (track of aircraft approximately N-S)

$93F_tL_oL_o$ Type of front and· its position (track of aircraft approximately E-W)

$94F_tGG$ Type of front and time of passage

951// Gradual change along the route

$952L_aL_a$ Change at latitude L_aL_a north along the route

$953L_aL_a$ Change at latitude L_aL_a south along the route

$954L_oL_o$ Change at longitude L_oL_o east along the route

$955L_oL_o$ Change at longitude L_oL_o west along the route

96GGGp (a) When GP= 0: a self-contained part of the forecast beginning at GG. All prior forecast conditions are superseded

(b) When GP = 1 to 4: change at either a regular or irregular rate at an unspecified time within the period beginning at GG and indicated by G_p

$97GGG_p$ Frequent or infrequent temporary fluctuations taking place within the period indicated by G_p

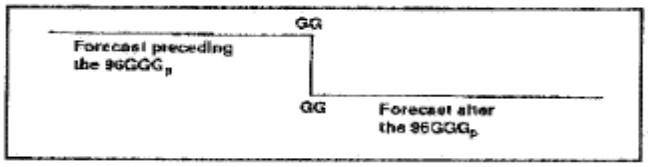
$9999C_2$ (a) When used in combination with $99GGG_p$: probability C_2 of occurrence of temporary fluctuation, indicated in tens of per cent

(b) When used in combination with $97GGG_p$: probability C_2 of occurrence of temporary fluctuation, indicated in tens of per cent

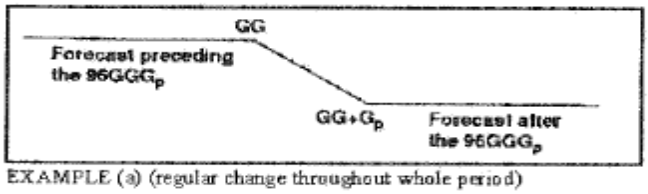
$99GGG_p$ Used in combination with $9999C_2$: time period G_p beginning at GG that the alternative value of a forecast element may occur

PICTORIAL ILLUSTRATION OF CHANGES OR FLUCTUATIONS

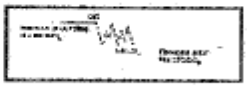
(with time and abscissa and, for example, with $h_sh_sh_s$ as ordinate in the diagrams)
Example



96GGG$_p$ - Change at unspecified time within indicated time period (G_p = 1 to 4)



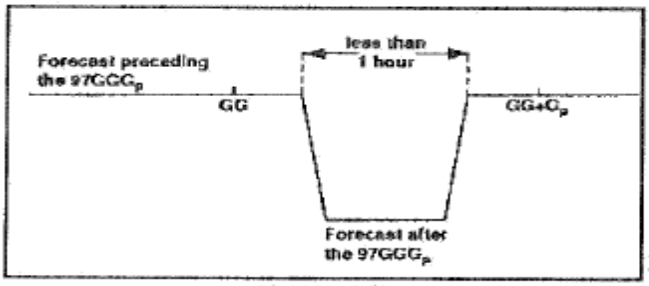
EXAMPLE (a) (regular change throughout whole period)



EXAMPLE (b) (irregular change throughout part or whole of period)

EX.

(s)



EXAMPLE (a)

EXAMPLE (b)

Exa
shov
dete

conditions. For improvements, the examples should be taken upside down.

NOTE: *Local variations in ARFOR, SAFOR and ROFOR may be described, if necessary by the following expressions:*

ESC	*escarpment*	
LOC	*locally (LOC, when used, will always be accompanied by plain language sufficient to identify the locality in which the phenomenon is expected)*	
LOV	*lowveld*	*to describe cloud in ARFOR, ROFOR and SAFOR, also visibility in SAFOR*
LAN	*inland*	
COT	*at the coast*	
MAR	*at sea*	
VAL	*in valleys*	
CIT	*near or over large towns*	
MON	*above high ground or mountains*	
SCT	*scattered (SCT is used when the phenomenon is expected to be scattered in space or time or in both)*	
LYR	*when cloud is layered*	*SAFOR only*
EMBD	*embedded, Cb only*	

PLAIN-LANGUAGE ALTERNATIVE TERMINOLOGY FOR THE GROUP $9i_3nnn$

$91P_2P_2P_2$ Forecast lowest QFF (e.g., "Forecast QFF 1002")

$92F_tL_oL_o$ The term FRONT should be used; the type is not normally designated; e.g., "FRONT 40N"

$93F_tL_oL_o$ The term FRONT should be used; the type is not normally designated; e.g., "FRONT 30E"

$94F_tGG$ The term FRONT should be used; the type is not normally designated; e.g., "FRONT 1200 UTC"

951// The term BECMG (without the time group) should be used for this type of change

$952L_aL_a$ The form FM L_aL_a N should be used for this type of change where L_aL_a indicates the latitude (north) at which the change takes place

$953L_aL_a$ The form FM L_aL_a S should be used for this type of change where L_aL_a indicates the latitude (south) at which the change takes place ROFOR

ONLY

$954L_oL_o$ The form FM L_oL_o E should be used for this type of change where L_oL_o indicates the longitude (east) at which the change takes place

$955L_oL_o$ The form FM L_oL_o W should be used for this type of change where L_oL_o indicates the longitude (west) at which the change takes place

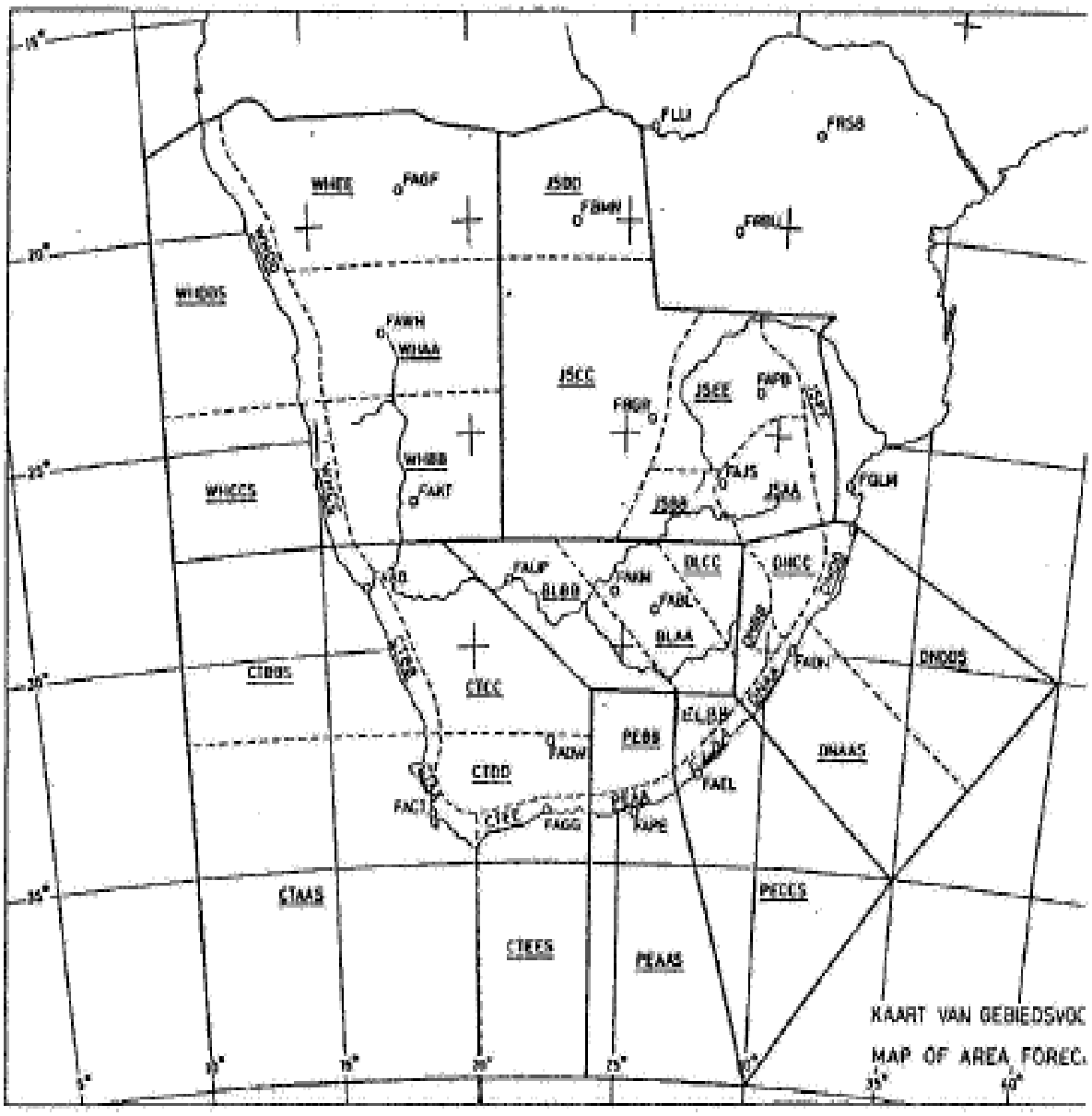
$96GGG_p$ (a) The form FMGG should be used to indicate the beginning of self-contained part of the forecast indicated by GG. All forecast conditions before FMGG are superseded by the conditions indicated thereafter

(b) The form BECMG $GGGG_eG_e$ should be used to indicate a change to forecast meteorological conditions expected to occur at either a regular or irregular rate at an unspecified time within the period beginning at GG and ending at G_eG_e

$9999C_2$ The form PROB (per cent) should be used for this group, either followed by GGG_eG_e to indicate the probability of occurrence of an alternative value of a forecast element (e.g. PROB30 1216), or followed by TEMPO GGG_eG_e to indicate the probability of occurrence of temporary fluctuations (e.g. PROB30 TEMPO 1216).

ADDENDUM 6

REGIONS FOR USE IN SAFOR MESSAGES



ADDENDUM 7

B – Turbulence

Code figure

0 None

1 Light turbulence

2 Moderate turbulence in clear air, occasional

3 Moderate turbulence in clear air, frequent

4 Moderate turbulence in cloud, occasional

5 Moderate turbulence in cloud, frequent

6 Severe turbulence in clear air, occasional

7 Severe turbulence in clear air, frequent

8 Severe turbulence in cloud, occasional

9 Severe turbulence in cloud, frequent

ADDENDUM 8

Direction in two figures

dd True direction, in tense of degrees, from which wind is blowing (or will blow)
Forecast true direction, in tens of degrees, from which wind will blow at a relevant grid point
True direction, in tens of degrees, from which wind is blowing, derived from movement of cloud Elements

d_hd_h True direction, in tens of degrees, from which wind will blow at the height indicated by $h_xh_xh_x$

d_jd_j True direction, in tens of degrees, from which jet-stream wind is blowing (or will blow)

d_md_m True direction, in tens of degrees, from which maximum wind will blow at the flight level given by $n_mn_mn_m$

True direction, in tens of degrees, from which maximum wind will blow at the height given by $h`_mh`_m$

d_sd_s True direction, in tens of degrees, towards which the system or front is moving

True direction, in tens of degrees, towards which the tropical cyclone or system is moving

d_wd_w True direction, in tens of degrees, from which waves are coming

$d_{w1}d_{w1}$

$d_{w2}d_{w2}$ True direction, in tens of degrees, from which swell waves are coming

d_od_o True direction, in tens of degrees, towards which sea-surface current is moving

d_od_o True direction, in tens of degrees, towards which sea-surface at selected and/or d_1d_1 significant depths starting with the sea surface is moving

d_nd_n

d_1d_1 True direction, in tens of degrees, from which wind is blowing at the specified levels

d_2d_2

d_nd_n

Code figure Code figure

00 Calm (no motion for d_sd_s or no waves)

01 5 – 14

02 15 – 24

03 25-34

04 35-44

05 45 – 54

06 55 – 64

07 65 – 74

08 75- 84

09 85 -94

10 95 – 104

11105 -114

12 115 -124

13 125 -134

14 135 – 144

15 145 -154

16 155 -164

17 165 -174

18 175 – 184

19 185 – 194

20 195 – 204

21 205 – 214

22 215 – 224

23 225 – 234

24 235 – 244

25 245 – 254

26 255 – 264

27 265 – 274

28 275 – 284

29 285 – 294

30 295 – 304

31 305 – 314

32 315 – 324

33 325 – 334

34 335 – 344

35 345 – 354

36 355 – 4

99 Variable, or all directions, or unknown (for $d_s d_{s)}$, or waves confused, direction indeterminate

ADDENDUM 9

$h_bh_bh_b$ Height of lowest level of turbulence

$h_fh_fh_f$ Altitude of the 0°C isotherm

$h_lh_lh_l$ Height of lowest level of icing

$h_sh_sh_s$ Height of base of cloud layer or mass, or observed or forecast vertical visibility

$h_th_th_t$ Altitude of cloud layer or mass

$h_xh_xh_x$ Altitude to which temperature and wind refer

Code figure Metres Code figure Metres

000<30

001 30

002 60

003 90

004 120

005 150

006 180

007 210

008 240

009 270

010 300

011 330

etc. etc.

099 2 970

100 3 000

110 3 300

120 3 600

etc. etc.

990 29 700

999 30 000 or more

NOTES:
(I) The code is direct reading in units 30 metres.
(2) The code table shall be considered as a coding device in which certain code figures are assign values. These are discrete values, not ranges. Any observation or forecast of values to be coded in the code table shall be made without regard to the code table. The coding is then accomplished according to the following rule: If the observed or forecast value is between two of the heights as given in table, the code figure for the lower height shall be reported.

ADDENDUM 10

i_2 - Zone type indicator

zzz - Zone specification

$0I_2zzz$

00000 Up to the turning point indicated by the first group $QL_aL_aL_oL_o$ which appears between the index numbers at the beginning of the message

$01QL_aL_a$ Up to latitude L_aL_a

$02QL_oL_o$ Up to latitude L_oL_o

04nnn Up to a point at a distance of nnn kilometres from preceding point

050ZZ For the area indicated in 5 zone numbers

$06QL_aL_a$ At latitude L_aL_a

$07QL_oL_o$ At latitude L_oL_o

09nnn At a point at a distance of nnn kilometres from preceding point

ADDENDUM 11

B_A – Turbulence

Code figure

O None (acceleration less than 0.15 g)

1 Light (acceleration from 0.15 to, but not including 0.5g)

2 Moderate (acceleration from 0.5 g to 1.0 g)

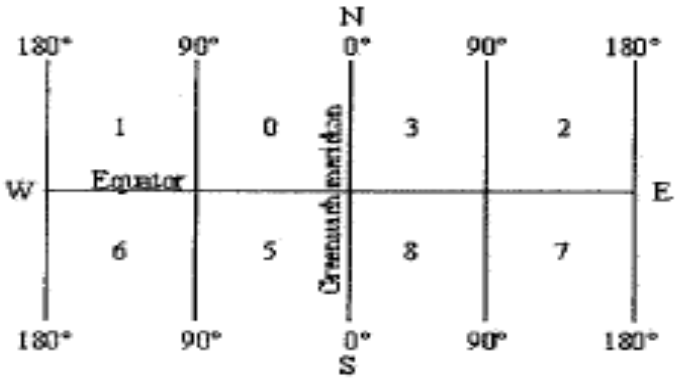
3 Severe. (acceleration 1.0 g)

NOTE: These accelerations, which may be positive or negative, are deviations from the normal acceleration of gravity (1.0 g).

ADDENDUM 12

Q - Octant of the globe

Code figure	**Longitude Hemisphere**	**Hemisphere**	**Code figure**	**Longitude**	
0	$0^0 – 90^0$W		5	$0^0 – 90^0$W	
1	$90^0 – 180^0$W	Northern	6	$90^0 – 180^0$W	Southern
2	$180^0 – 90^0$E		7	$180^0 – 90^0$E	
3	$90^0 – 0^0$E		8	$90^0 – 0^0$E	



ADDENDUM 13

A

s_1 - Type of navigation system

Code figure

O Inertial navigation system

1 OMEGA

B

s_2 - Type of system used

Code figure

0 ASDAR

1 ASDAR (ACARS also available but not operative)

2 ASDAR (A CARS also available and operative)

3 ACARS

4 ACARS (ASDAR also available but not operative)

5 ACARS (ASDAR also available and operative)

C

s_3 - Temperature precision

Code figure

0 Low (precision near 2.0°C)

1 High (precision near l.0°C)

ADDENDUM 14

t_L - Thickness of layer

Code figure

0 Up to top of cloud

1 300m

2 600m

3 900m

4 1200m

5 1 500m

6 1 800m

7 2 100m

8 2400m

9 2700m

ADDENDUM 15

$w_1w_1w_1$ – Forecast weather

Code figure Abbreviation

111 TS Thunderstorm

222 TRS Tropical cyclone

333 LSQ Severe line squall

444 HAIL hail

555 MTW Marked mountain waves

666 SAND Widespread sandstorm

777 DUST Widespread duststorm

888 FZR Freezing rain

ADDENDUM 16

ZZ – Meteorological zone number by 5 degrees of longitude or latitude

EAST-WEST ZONES			NORTH-SOUTH ZONES	
Zone No	Longitude West	Longitude East	Zone No	Latitude
01	0° - 5°	180° - 175°	51	90°N - 85°N
02	5° - 10°	175° - 170°	52	85°N - 80°N
03	10° - 15°	170° - 165°	53	80°N - 75°N
04	15° - 20°	165° - 160°	54	75°N - 70°N
05	20° - 25°	160° - 155°	55	70°N - 65°N
06	25° - 30°	155° - 150°	56	65°N - 60°N
07	30° - 35°	150° - 145°	57	60°N - 55°N
08	35° - 40°	145° - 140°	58	55°N - 50°N
09	40° - 45°	140° - 135°	59	50°N - 45°N
10	45° - 50°	135° - 130°	60	45°N - 40°N
11	50° - 55°	130° - 125°	61	40°N - 35°N
12	55° - 60°	125° - 1120°	62	35°N - 30°N
13	60° - 65°	120° - 115°	63	30°N - 25°N
14	65° - 70°	115° - 110°	64	25°N - 20°N
15	70° - 75°	110° - 105°	65	20°N - 15°N
16	75° - 80°	105° - 100°	66	15°N - 10°N
17	80° - 85°	100° - 95°	67	10°N - 5°N
18	85° - 90°	95° - 90°	68	5°N - 0°
19	90° - 95°	90° - 85°	69	0° - 5°S
20	95° - 100°	85° - 80°	70	5°S - 10°S
21	100° - 105°	80° - 75°	71	10°S - 15°S
22	105° - 110°	75° - 70°	72	15°S - 20°S
23	110° - 115°	70° - 65°	73	20°S - 25°S
24	115° - 120°	65° - 60	74	25°S - 30°S
25	120° - 125°	60° - 55°	75	30°S - 35°S
26	125° - 130°	55° - 50°	76	35°S - 40°S
27	130° - 135°	50° - 45	77	40°S - 45°S
28	135° - 140°	45° - 40°	70	45°S - 50°S
29	140° - 145°	40° - 35°	79	50°S - 55°S
30	145° - 150°	35° - 30°	80	55°S - 60°S
31	150° - 155°	30° - 25°	81	60°S - 65°S
32	155° - 160°	25° - 20°	82	65°S - 70°S
33	160° - 165°	20° - 15°	83	70°S - 75°S
34	165° - 170°	15° - 10°	84	75°S - 80°S
35	170° - 175°	10° - 5°	85	80°S - 85°S
36	175° - 180°	5° - 0°	86	85°S - 90°S

ADDENDUM 17

I_c - Type of forecast ice accretion on the external parts of aircraft

Code figure

0 No icing

1 Light icing

2 Light icing in cloud

3 Light icing in precipitation

4 Moderate icing

5 Moderate icing in cloud

6 Moderate icing in precipitation

7 Severe icing

8 Severe icing in cloud

9 Severe icing in precipitation

ADDENDUM 18

F_t – Type of front

0 Quasi-stationary front at the surface

1 Quasi-stationary front above the surface

2 Warm front at the surface

3 Warm front above the surface

4 Cold front at the surface

5 Cold front above the surface

6 Occlusion

7 Instability line

8 Intertropical front

9 Convergence line

Note: Intertropical fronts shall be indicated by using the tropical section of the code form.

ADDENDUM 19

CC - Genus of cloud

Code figure

CI Cirrus (Ci)

CC Cirrocumulus (Cc)

CS Cirrostratus (Cs)

AC Altocumulus (Ac)

AS Altostratus (As)

NS Nimbostratus (Ns)

SC Stratocumulus (Sc)

ST Stratus (St)

CU Cumulus (Cu)

CB Cumulonimbus (Cb)

ADDENDUM 20

SYMBOLIC LETTERS AND REMARKS AS TO THE METHODS OF CODING

REMARK: *When coding a value which can be directly transcribed into figures, and when the number of significant figures of this value (expressed in the units given in the relevant specification) is lower than the number of symbolic letters reserved for this element, one or more zeros, as appropriate, must be inserted at the left of the significant figure(s) of the reported value.*

AAAAA Area

B Direction of longitude (E = East, W = West)

B Turbulence. (Addendum 7)

B_A Turbulence. (Addendum 11)

BBBB Additional plain-language information, e.g. clear air turbulence, icing, strong surface inversion, windshear.

CC Genus of cloud. (Addendum 19)

(1) The genus of the cloud of the reported layers shall be determined on the basis of the 10 genera of cloud and of their illustrations given in the International Cloud Atlas.

C_2 Probability in tens of per cent

(1) C_2 cannot exceed 5 = 50 per cent. (If the probability of occurrence of an element exceeds 50 per cent, then that occurrence shall be the predominant feature of the forecast.)

C_2C_2 Probability in per cent rounded off to whole tens.

(1) C_2C_2 cannot exceeds 50 = 50 per cent. (If the probability of occurrence of an element exceeds 50 per cent, then that occurrence shall be the predominant feature of the forecast.)

CCCC ICAO international four-letter location indicator.

D_v Direction of observation given by one or two-letter indicators of the eight points of the compass (N, NE, etc.)

D_RD_R Number of the runway to which the runway visual range given by $V_RV_RV_RV_R$ refers.

d_hd_h True direction, in tens of degrees, from which wind will blow at the altitude indicated by $h_xh_xh_x$.

d_md_m True direction (rounded off to the nearest 5), in tens of degrees, from which maximum wind is blowing.

(1) When encoding wind direction that has been rounded off to the nearest 5, the hundreds and tens figure of this rounded direction shall be reported by dd and the unit's figure shall be added to the hundreds figure of the wind speed.

ddd True direction, in degrees, rounded off to the nearest 10, from which the wind is blowing (or will blow).

F_t Type of front. (Addendum 18)

ff Wind speed, in kilometres per hour or knots or metres per second.

(1) For wind speeds of 100 units or more, see Regulation 1.4.6 or 2.3.5, as appropriate.

f_mf_m Maximum wind speed, in kilometres per hour or knots or metres per second.

(1) See Note (1) above.

fff Wind speed, in knots, at the level given by $h_th_th_t$

$f_gf_gf_g$ Maximum derived equivalent vertical gust, in tenths of a metre per second.

$f_jf_jf_j$ Wind speed, in kilometres per hour or knots or metres per second, in the jet core.

$f_mf_mf_m$ Maximum wind speed in knots.

G_p Period nearest whole hour.

(1) If the period is less than half an hour, G_p shall be encoded as 0.

GG Actual time of observation, forecast, to the nearest whole hour UTC.

(1) In the case of surface observations, the actual time of observation is the time at which the barometer is read.

(2) In the case of upper-air observations, the actual time of observation is the time at which the balloon or rocket is actually released, or the time at which the aircraft actually takes off from the surface.

(3) In the case of atmospherics observation, the actual time of observation is the time at which the observation of all specified elements is completed.

Valid time, to the nearest whole hour UTC, of the forecast.

(1) See regulations 2.11, 3.4 and 4.4.

G_FG_F Valid time, to the whole hour UTC, of the temperature forecast.

G_eG_e Time, to the nearest whole hour UTC, of the end of the forecast period that began at GG.

G_1G_1 Time of commencement of period of forecast, in whole hours UTC.

(1) When the period of forecast commences at midnight, G_1G_1 shall be encoded 100.

G_2G_2 Time of ending of period of forecast, in whole hours UTC.

(1) When the period of forecast commences at midnight, G_2G_2 shall be encoded 24.

(2) When the period between 25 and 48 hours after G_1G_1, G_2G_2 shall be encoded by adding 50 to the time of ending of period of forecast.

GGgg Time of observation, in hours and minutes UTC.

Time, in hours and minutes UTC, of the beginning or end of a forecast change, or at which specific forecast condition(s) are expected.

GGggZ Time of observation of forecast, in hours and minutes UTC, followed by the letter Z as an abbreviated indicator of UTC.

(1) Official time of observation laid down by the meteorological office concerned, in accordance

with regional air navigation agreements.

(2) Time of occurrence of change(s) which justified the issue of the report.

(3) Time of origin of forecast.

$G_FG_Fg_Fg_F$ Time, in whole hours UTC, at which the WINTEM message is valid.

(1) As a result, g_Fg_F shall always be equal to 00.

g_pg_p Number of hours to be added to, or subtracted from, the time given in the preamble, as specified to obtain the time of the supplementary information.

$h`_ph`_p$ Height [(1)] of the tropopause level.

$h`_jh`_j$ Height* of the level of the jet stream core.

$h`_mh`_m$ Height* of the maximum wind level.

$h_Bh_Bh_B$ Height of lowest level of turbulence. (Addendum 9)

Taf heights are above surface; ARFOR, ROFOR heights are above sea-level.

$h_dh_dh_d$ Flight level, in hundreds of feet.

$h_fh_fh_f$ Altitude of the 0°C isotherm (Addendum 9)

$h_ih_ih_i$ Height of lowest level of icing. (Addendum 9)

(1) Heights are above sea-level.
$h_sh_sh_s$ Height of base of cloud layer or mass, or observed or forecast vertical visibility. (Addendum 9)

(1) If, notwithstanding the existence of fog, sandstorm, duststorm, blowing snow or other obscuring phenomena, the sky is discernible, the partially obscuring phenomena shall be disregarded.

(2) Heights are above surface.

(3) For ARFOR, ROFOR, SAFOR heights are above sea-level.

$h_th_th_t$ Tops of cloud layer or mass. (Addendum 9)

$h_xh_xh_x$ Altitude to which temperature and wind refer. (Addendum 9)

I_c Type of forecast ice accretion on the external parts of aircraft. (Addendum 7)

$I_A…I_A$ Aircraft identifier

(1) The aircraft identifier is an alphanumeric which includes, either directly or indirectly, the airline identifier and aircraft identifier and, in the case of an ASDAR report, the ASDAR flight

unit identification.

(2) In an AMDAR report from an ASDAR aircraft, the aircraft identifier, by convention, ends with the letter Z. In the case of an AMDAR report from a non-ASDAR aircraft, the letter Z is not appended.

i Tendency of runway visual range values, indicated by i = U for increasing and i = D for decreasing runway visual range values, and i = N when no distinct change in runway visual range is observed.

i_2 Zone type indicator. (Addendum 10)

(1) This symbol indicates the way in which the route is divided into sections.

i_3 Indicator for supplementary phenomena. (Addendum 5)

$i_p i_p i_p$ Indicator for phase of flight and type of observation.

(1) See Regulation 6.2. l.

$L_a L_a$ Latitude, in whole degrees.

$L_o L_o$ Longitude, in whole degrees.

(1) The hundreds digit shall be omitted for longitudes 100 to 180.

$L_a L_a L_a L_a$ Latitude, in degrees and minutes.

$L_o L_o L_o L_o$ Longitude, in degrees and minutes.

$N_s N_s N_s$ Category of cloud amount, scattered, broken or overcast, given by three-letter abbreviations SCT (1 to 4 octas), BKN (5 to 7 oktas) or OVC (8 octas). *ISOL (individual CB cells), *OCNL (occasional CB cells), *FRQ (CB cells with little/no separation, *EMBD (embedded cells) <R><R>* = SAFOR only

nnn Specifications related to supplementary phenomena. (Addendum 11)

$P_1 P_1$

$P_2 P_2$

$P_n P_n$ Pressure of standard isobaric surfaces (1000 hPa = 00, 925 hPa = 92).

$P_2 P_2 P_2$ Pressure reduced to mean sea-level, in whole hectopascals.

$P_H P_H P_H P_H$ QNH value, in whole hectopascals

Q Octant of the globe. (Addendum 12)

S_h Sign of the pressure altitude.

(1) If pressure altitude is zero or positive (aircraft is at or above the standard datum plane of 1013.2 hPa), S_h shall be encoded as the letter F.

(2) If pressure altitude is negative (aircraft is below the standard datum plane of 1013.2 hPa), S_h, shall be encoded as the letter A.

SS Sign of the temperature.

(1) If temperature is zero or positive, SS shall be encoded as the letter PS.

(2) If temperature is negative, SS shall be encoded as the letter MS.

S_1 Type of navigation system. (Addendum 13 A)

S_2 Type of system used. (Addendum 13 B)

S_3 Temperature precision. (Addendum 13 C)

TT Two-letter indicators preceding, without a space, the time group, where TT= AT, FM (from) or 1L (until).

T_pT_p Air temperature, in whole degrees Celsius, at the level given by $h`_ph`_p$

(1) For negative values, T_pT_p shall be preceded by the letter M.

T_hT_h Air temperature, in whole degrees Celsius, at the height indicated by $h_xh_xh_x$

(1) For negative values, T_hT_h shall be preceded by the letter M.

$T`_dT`_d$ Dew-point temperature, in whole degrees Celsius.

(1) For negative values, $T`_dT`_d$ shall be preceded by the letter M.

$T_AT_AT_A$ Air temperature, in tenths of a degree Celsius, at the level given by $h_1h_1h_1$.

$T_dT_dT_d$ Dew-point temperature, in tenths of a degree Celsius, its sign being given by SS.
TTTTT Change indicators of trend forecasts and aerodrome forecasts (BECMG, TEMPO).

(1) Specifications for these change indicators are given in Addendum 13.

t_L Thickness of layer. (Addendum 14)

UUU Relative humidity of the air, in per cent, the first figure being zero except for UUU = 100 per cent.

VVVV Horizontal visibility at surface, in metres, in increments of 50 metres up to 500 metres, in increments of 100 metres between 500 and 3 000 metres, in increments of 500 metres between 3 000 and 5 000 metres and in increments of 1 000 metres between 5 000 metres up to 9 999 metres, with 9999 indicating visibility of 10 km and above.

(1) If the value is between two increments, it shall be rounded off downward to the lower of the two increments. For example, a visibility of 370 metres shall be reported as 0350, a visibility of 570 metres shall be reported as 0500, a visibility of 3 700 metres shall be reported as 3500, and a visibility of 5 700 metres shall be reported as 5000.

$V_RV_RV_RV_R$ Runway visual range, in metres.

(1) Values up to and including 800 metres shall be reported in steps not greater than 60 metres but not smaller than 25 metres, and those above 800 metres in steps of 100 metres.

$V_xV_xV_xV_x$ Maximum horizontal visibility at surface, in metres, in increments of 1 000 metres between 5 000 metres up to 9 999 metres, with 9999 indicating visibility of 10 km and above.

vv Vertical wind shear in knots per 300 metres.

w`w` Significant present and forecast weather. (Addendum 2)

$w_1w_1w_1$ Forecast weather. (Addendum 15)

YY Day of the month (UTC), with 01 indicating the first day, 02 the second day, etc.:

(a) On which the actual forecast falls;

(b) Indicating the date of the beginning of the period for which the whole forecast or set of forecasts are valid.

Y_FY_F Day of the month (UTC) on which the WINTEM message is valid.

ZZ Meteorological zone number by 5 degrees of longitude or latitude. (Addendum 16)

l. These heights are indicated in ICAO flight level numbers with last figure omitted. The ICAO flight levels are related to a pressure datum of 1013.2 h Pa and are separated by a nominal distance of 500 feet. Schema of coding:

CODE FIGURE ICAO FLIGHT LEVEL NUMBER METRES (approx.) FEET

20 200 6 000 20 000

20 205 6 150 20 500

21 210 6 300 21 000

21 215 6 450 21 500

etc. etc. etc. etc.

ADDENDUM 21

S - State of the sea

S' - State of the water surface in a lightning area

Code figure	Descriptive terms	Height* in metres
0	Calm (glassy)	0
1	Calm (rippled)	0 – 0.1
2	Smooth (wavelets)	0.1 – 0.5
3	Slight	0.5 – 1.25
4	Moderate	1.25 – 2.5
5	Rough	2.5 – 4
6	Very rough	4 – 6
7	High	6 – 9
8	Very high	9 – 14
9	Phenomenal	Over 14

NOTES:
*(1) *These values refer to well-developed wind waves of the open sea. While priority shall be given to the descriptive terms, these height values may be used for guidance by the observer when reporting the total state of agitation of the sea resulting from various factors such as wind, swell, currents, angle between swell and wind, etc.*

(2) The exact bounding height shall be assigned for the lower code figure: e.g. a height of 4 m is coded as 5.

ADDENDUM 22

E_R Runway deposits

Code
Figure

0 Clear and dry

1 Damp

2 Wet and water patches

3 Rime and frost covered (depth normally less than 1 mm)

4 Dry snow

5 Wet snow

6 Slush

7 Ice

8 Compacted or rolled snow

9 Frozen ruts or ridges

/ Type of deposit not reported (e.g. due to runway clearance in progress)

ADDENDUM 23

C_R Extent of runway contamination

Code
Figure

1 Less than 10 per cent of runway contaminated (covered)

2 11 per cent to 25 per cent of runway contamination (covered)

3 Reserved

4 Reserved

5 26 per cent to 50 per cent of runway contaminated (covered)

6 Reserved

7 Reserved

8 Reserved

9 51 per cent to 100 per cent of runway contaminated (covered)

/ Not reported (e.g. due to runway clearance in progress)

ADDENDUM 24

e_Re_R Depth of deposit

Code Figure	
00	Less than 1 mm
01	1 mm
02	2 mm
03	3 mm
…	
89	89 mm
90	90 mm
91	Reserved
92	10 cm
93	15 cm
94	20 cm
95	25 cm
96	30 cm
97	35 cm
98	40cm or more
99	Runway or runways non-operational due to snow, slush, ice, large drifts or runway clearance, but depth not reported
//	Depth of deposit operationally not significant or not measurable

ADDENDUM 25

B_RB_R friction coefficient/braking action

Code Figure	
00	friction coefficient 0.00
01	friction coefficient 0.01
…	
88	friction coefficient 0.88
89	friction coefficient 0.89
90	friction coefficient 0.90
91	braking action poor
92	braking action medium/poor
93	braking action medium
94	braking action medium/good
95	braking action good
96	reserved
97	reserved
98	reserved
99	unreliable
//	braking conditions not reported and/or runway not operational