

International Civil Aviation Organization



**THIRTEENTH MEETING OF THE ASIA/PACIFIC REGIONAL OPMET
BULLETIN EXCHANGE WORKING GROUP (ROBEX WG/13) and
FIFTH MEETING OF METEOROLOGICAL HAZARDS TASK FORCE
(MET/H TF/5)**

Seoul, Republic of Korea, 18 March 2015

Agenda Item (conjoint session) 2: SIGMET and Advisory Information

TROPICAL CYCLONE ADVISORIES AND SIGMETS

(Presented by Australia)

SUMMARY

This paper presents an overview of tropical cyclone (TC) advisory (TCA) and TC SIGMETs and identifies a number of inconsistencies and deficiencies in the existing guidance and procedures associated with their generation.

1. INTRODUCTION

1.1 The Tropical Cyclone Advisory Centres (TCACs) are a *'meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, world area forecast centres and international OPMET databanks regarding the position, forecast direction and speed of movement, central pressure and maximum surface wind of tropical cyclones'* (refer Annex 3, Chapter 1). They do this by issuing Tropical Cyclone Advisories (TCAs) at least every 6 hours when a tropical cyclone (TC) has developed or is expected to develop.

1.2 A Meteorological Watch Office (MWO) is responsible for issuance, among other things, of SIGMET information. Annex 3 (Chapter 7, clause 7.1.4) recommends that *'SIGMET messages concerning volcanic ash cloud and tropical cyclones should be based on advisory information provided by VAACs and TCACs, respectively'*.

2. DISCUSSION

2.1 The TCA *'shall be issued for tropical cyclones when the maximum of the 10-minute mean surface wind speed is expected to reach or exceed 17 m/s (34 kt) during the period covered by the advisory'* (refer Annex 3, Appendix 2, paragraph 5.1.1) and *'shall be in accordance with the template shown in Table A2-2'* of Annex 3.

2.2 While the majority of the SIGMET elements can directly be accessed from the TCA, some elements are not contained in the TCA, such as the radius and vertical extent of cumulonimbus (CB) cloud associated with the TC (refer to Attachment for an example).

2.3 In addition some elements need to be inferred from TCA information and there is limited guidance available for forecasters. For example, the TCA does not specifically indicate the change in intensity of the TC as either intensifying (INTSF), weakening (WKN) or there being no change (NC). The intensity can be inferred from the forecast maximum winds but currently there is no guidance available for thresholds for each criteria.

2.4 The TCA time of origin (DTG) in Annex 3 Table A2-2 states that the time of origin is the issue time, however Australia understands this to be the analysis time. It is suggested the reference to issue time be removed which would also then be consistent with the Volcanic Ash Advisory template.

Element	Detailed content	Template(s)	Examples
1	Identification of the type of message	Type of message	TC ADVISORY
2	Time of origin	Year, month, day and time in UTC of issue	DTG: nnnnnnn/nnnnZ
3	Name of TCAC	Name of TCAC (location indicator or full name)	TCAC: nnnn or nnnnnnnnnn
4	Name of tropical cyclone	Name of tropical cyclone	TC: nnnnnnnnn or NN

Year, month, day and
Time in UTC ~~of issue~~

2.5 The ICAO SIGMET Guide and ICAO Annex 3 state that the forecast position of the TC should be the position at the end of the validity of the SIGMET; however, this is not easily achieved given the issue and validity times of the TCA. Using the example of a TC which is analysed based on the observations at time 0600Z, it will take a period of time to receive satellite imagery, fully analyse the TC and issue the subsequent TCA (say one hour). This follows that the TCA time of origin (DTG) would be 0600Z and the TCA would contain forecast positions at 1200, 1800, 0000 and 0600Z (refer to Attachment). It is not clear whether the subsequent SIGMET (which may be issued at 0715Z with a validity period of 0715 to 1315Z as an example) should include a:

- a) OBS position at 0600Z and the FCST position at 1200Z (which would then mean that it wasn't at the end time of the SIGMET);
- b) OBS position at 0600Z and FCST at 1315Z (by interpolating); or
- c) FCST position at 1200Z and FCST at 1800Z (with a different validity period);
- d) FCST position at 0715Z and FCST 1315Z (interpolating again).

2.6 Australia recently adopted option a) above and whilst this may not meet the ICAO requirement for a forecast position at the end of validity, this option ensures the TCA and SIGMET provide common information, minimizing the potential for pilot confusion and avoiding potential errors from forecaster interpolation.

2.7 The guidance for SIGMETs is also deficient with regard to sheared systems, whereby the thunderstorm area is away from the TC centre (often in one sector). In this situation a forecaster can issue:

- a) a single TC SIGMET, with centre aligned with the TC centre, with a large radius covering both the TC and the embedded thunderstorm activity;
- b) a single TC SIGMET covering the TCA and area of thunderstorms, with a medium sized radius and centre located such that the minimum geographic area is covered by the SIGMET; or
- c) a TC SIGMET for the area of the tropical cyclone and an EMBD TS SIGMET for the area of thunderstorms beyond the area of the TC SIGMET.

2.8 Since the disbandment of the ICAO Meteorological Warning Study Group (METWSG) there is no longer a study group specifically responsible for addressing the aforementioned issues. Australia therefore seeks advice as to how these issues should be resolved and whether they could be discussed at the upcoming ICAO Meteorological Panel meeting in April in Montreal or whether the ICAO APAC Secretariat could raise the issues directly with ICAO Headquarters.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Review the information in this paper;
- b) Provide comment on how their State tackles the issued identified in this paper; and
- c) Request the Secretariat to consider raising these issues with ICAO Headquarters.

ATTACHMENT

Tropical Cyclone Advisory (TCA) Example

FKAU05 ADRM 070645

TC ADVISORY

DTG: 20130307/0600Z
TCAC: DARWIN
TC: SANDRA
NR: 02
PSN: S1500 E15600
MOV: NE 07KT
C: 989HPA
MAX WIND: 35KT
FCST PSN +6HR: 07/1200Z S1500 E15630
FCST MAX WIND +6HR: 40KT
FCST PSN +12HR: 07/1800Z S1448 E15706
FCST MAX WIND +12HR: 45KT
FCST PSN +18HR: 08/0000Z S1454 E15736
FCST MAX WIND +18HR: 50KT
FCST PSN +24HR: 08/0600Z S1500 E15800
FCST MAX WIND +24HR: 60KT
RMK: NIL
NXT MSG: 20130307/1300Z

Tropical Cyclone SIGMET Format

WCAAii CCCC YYGGgg [BBB]

CCCC SIGMET [n][n]n VALID YYGGgg/YYGGgg CCCC-

CCCC <FIR/CTA Name> FIR TC <Name> OBS/FCST [AT GGggZ] <Location> <Horizontal and vertical extent> <Movement> <Intensity changes> <Forecast position>=

Tropical Cyclone SIGMET Example

WCAU01 ABRF 070710

YBBB SIGMET D02 VALID 070715/071315 YBRF-

YBBB BRISBANE FIR TC SANDRA OBS AT 0600Z S1500 E15600

CB TOP FL500 WI 280NM OF CENTRE MOV NE 07KT INTSF

FCST 1200Z TC CENTRE S1500 E15630=