International Civil Aviation Organization

NINETEENTH MEETING OF THE METEOROLOGY SUB-GROUP (MET SG/19) OF APANPIRG

Bangkok, Thailand, 3 – 6 August 2015

Agenda Item 7: Regional Guidance Material

SIGMET PAMPHLETS

(Presented by MET/H TF Ad Hoc Group)

SUMMARY

This paper presents the draft tropical cyclone (WC) and other phenomena (WS) SIGMET pamphlets in line with Amendment 76 to *Annex 3 – Meteorological Service for International Air Navigation* which will replace the outdated SIGMET posters.

1. INTRODUCTION

1.1 At the third meeting of the Meteorological Hazards Task Force (MET/H TF/3), held in Bangkok from 13-15 March 2013, it was agreed that Australia, New Zealand and Hong Kong, China review the SIGMET posters following Amendment 76 to *Annex 3 – Meteorological Service for International Air Navigation*.

1.2 The fourth meeting of the Meteorological Hazards Task Force (MET/H TF/4), held in Beijing, China from 19-21 March 2014, formulated the agreed action 4/12 as follows: *'Ad-hoc group consisting of Australia, Hong Kong-China and New Zealand (Rapporteur) to review and update the SIGMET posters to realign with Amendment 77 to Annex 3 in 2016*'.

1.3 The fifth meeting of the Meteorological Hazards Task Force (MET/H TF/5), held in Seoul, Republic of Korea from 18-20 March 2015, was presented with a draft of the WS and WC SIGMET pamphlets and subsequently formulated the following Decision:

MET/H TF/5 Decision 5/1 – Regional guidance material: SIGMET pamphlets
That, in order to enhance the guidance available to States for the production of SIGMET:

a) The draft pamphlets presented in MET/H TF/5 WP/4, intended as a quick reference guide for the preparation of [WC and WS] SIGMET, be further developed and a new draft pamphlet be developed for [WV] SIGMET and promulgated through the MET SG to APANPIRG, ICAO HQ and WMO for final review and further action;
b) Arrangements be proposed for the appropriate publication/distribution of the (approved) SIGMET pamphlets in electronic form; and
c) Future revisions are to be developed to realign all the SIGMET pamphlets with Amendment 77 to ICAO Annex 3 for final review and approval in time for applicability in November 2016.

2. DISCUSSION

2.1 Discussion within the ad hoc group, and at the MET/H TF, regarding the format of the information concluded that it would be an advantage to provide the information in an A4 pamphlet style publication. This would allow for the information to be updated more readily as well as providing a format that could be easily viewed and/or downloaded from the Internet or sent to States via email.

2.2 The ad hoc group has incorporated the feedback and suggested changes to the WS and WC SIGMET pamphlets that were presented at the MET/H TF/5 and updated draft pamphlets are given in **Attachments A and B**.

2.3 The ad hoc group is still working on the draft WV SIGMET pamphlet.

3. RECOMMENDATION

3.1 It is recommended that the METSG/19 adopt the following draft Conclusion:

Draft Conclusion 19/x – SIGMET Pamphlets

a) The MET SG review the WS and WC SIGMET pamphlets and provide comment to the ICAO RO MET no later than 7 August 2015.

b) The final versions of the WS and WC SIGMET pamphlets (as agreed by the ICAO RO MET and the ad hoc group) be forwarded to ICAO RO MET for publication on the APAC eDocuments website;

c) The ad hoc group, consisting of Australia, New Zealand and Hong Kong China, further develop the WV SIGMET pamphlet; and

d) An ad hoc group, consisting of Australia, New Zealand and Hong Kong China, review the pamphlets again in July 2016 when Amendment 77 to ICAO Annex 3 is published to ensure that they are updated prior to the effective date of November 2016.

4. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this working paper; and

b) adopt the Conclusion in paragraph 3.1.

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SIGMET QUICK REFERENCE GUIDE
WS SIGMET

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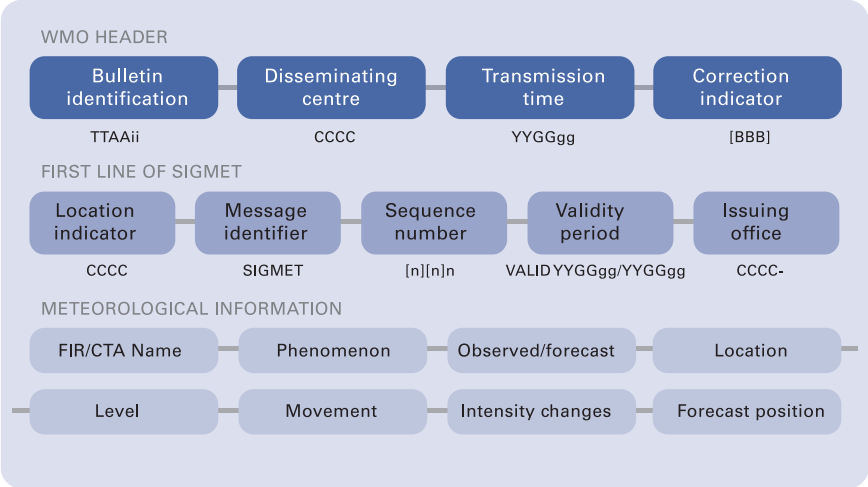
SIGMET Abbreviations

ABV	Above
CNL	Cancel or cancelled
CTA	Control area
FCST	Forecast
FIR	Flight Information Region
FL	Flight level
FT	Feet
INTSF	Intensify or intensifying
KT	Knots
KMH	Kilometres per hour
M	Metres
MOV	Moving
NC	No Change (in intensity)
NM	Nautical Miles
OBS	Observed
SFC	Surface
STNR	Stationary
TOP	Top (of CB cloud)
WI	Within (area)
WKN	Weakening (intensity)
Z	Coordinated Universal Time

WS SIGMET

A SIGMET provides concise information issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specific en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. The WS SIGMET provides information on phenomena other than tropical cyclones and volcanic ash.

SIGMET Structure



WMO Header

Bulletin identification

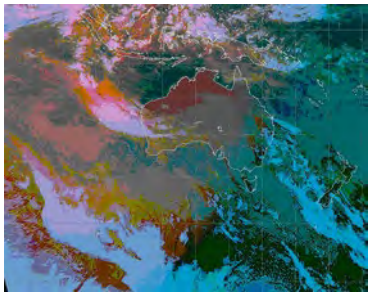
TT	Data type designator	**WS** – for SIGMET for meteorological phenomena other than volcanic ash cloud and tropical cyclone
AA	Country or territory designators	Assigned according to Table C1, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)
ii	Bulletin number	Assigned on national level according to p 2.3.2.2, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)

Disseminating centre

CCCC is the ICAO location indicator of the communication centre disseminating the message (this may be the same as the MWO location indicator).

Transmission time

YYGGgg is the date/time group; where YY is the day of the month and GGgg is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).



MTSAT-1R icing enhancement. Dark areas indicate the presence of supercooled liquid water (black by night, red by day). High level cirrus (bright areas) may prevent the satellite from seeing the lower level clouds.

Anvil of a cumulonimbus cloud

Duststorm, Sydney, 23 September 2009. Image courtesy of Elly Spark, Bureau of Meteorology.

Correction indicator

BBB should only be included when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall take the form **CCx** for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc., for a specific SIGMET.

First line of SIGMET

Location indicator

CCCC is the ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers.

Message identifier

The message identifier is **SIGMET**.

Sequence number

The daily sequence number in the form **[n][n]n**, e.g. 1, 2, 01, 02, A01, A02, restarts every day for SIGMETs issued from 0001 UTC.

Validity period

The validity period is given in the format **VALID YYGGgg/YYGGgg** where YY is the day of the month and GGgg is the time in hours and minutes UTC. The period of validity for a WS SIGMET shall be no more than 4 hours.

Issuing Office

CCCC- is the ICAO location indicator of the MWO originating the message followed by a hyphen.

Meteorological Information

FIR/CTA Name

The ICAO location indicator and full name of the FIR/CTA for which the SIGMET is issued in the form **CCCC <name> FIR[/UIR] or CCCC <name> CTA**.

Phenomenon

Code	Description
OBSC TS	Obscured thunderstorms
EMBD TS	Embedded thunderstorms
FRQ TS	Frequent thunderstorms
SQL TS	Squall line thunderstorms
OBSC TSGR	Obscured thunderstorms with hail
EMBD TSGR	Embedded thunderstorms with hail
FRQ TSGR	Frequent thunderstorms with hail
SQL TSGR	Squall line thunderstorms with hail
SEV TURB	Severe turbulence
SEV ICE	Severe icing
SEV ICE (FZRA)	Severe icing due to freezing rain
SEV MTW	Severe mountain wave
HVY DS	Heavy duststorm
HVY SS	Heavy sandstorm
RDOACT CLD	Radioactive cloud

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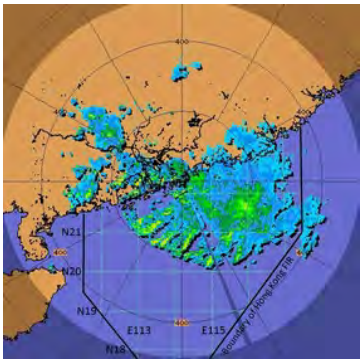
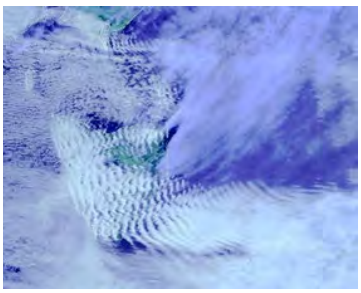


Widespread thunderstorms affecting the Southern China and the northern part of South China Sea on 9 May 2014.

E	East or eastern longitude
ENE	East-north-east
ESE	East-south-east
N	North or northern latitude
NE	North-east
NNE	North-north-east
NNW	North-north-west
NW	North-west
S	South or southern latitude
SE	South-east
SSE	South-south-east
SSW	South-south-west
SW	South-west
W	West or western longitude
WNW	West-north-west
WSW	West-south-west



Satellite image of mountain waves over Tasmania, 3 December 2002.

Observed or forecast

Whether the phenomenon is observed or forecast in the form **OBS [AT GGggZ]** or **FCST [AT GGggZ]** where GG is hours and gg minutes UTC.

Location

The location of the phenomenon is provided with reference to geographical coordinates in latitude and longitude in degrees and minutes.

Level

The level or vertical extent of the phenomenon:
FLnnn or **nnnnM** or **nnnnFT** or **SFC/FLnnn** or **SFC/nnnnM** or **SFC/nnnnFT** or **FLnnn/nnn** or **nnnn/nnnnFT** or **TOP FLnnn** or **ABV FLnnn** or **TOP ABV FLnnn**.

Movement

Direction and rate of movement of the phenomenon where the direction is given with reference to one of the sixteen points of the compass (using the appropriate abbreviation) and the rate is given in KT (or KMH) in the form **MOV <direction> <speed>KT** or **KMH**. The abbreviation **STNR** (Stationary) is used if no significant movement is expected.

Intensity changes

The expected evolution of the phenomenon's intensity as indicated by:
INTSF or **WKN** or **NC**

Forecast position (optional)

The forecast position of the hazardous phenomena at the end of the validity period of the SIGMET message in the form **FCST <GGgg>Z <location>**.

Renewing a SIGMET

A SIGMET is renewed with a new sequence number when the validity period is due to expire but the phenomenon is expected to persist.

Cancelling a SIGMET

If, during the validity period of a SIGMET, the phenomenon for which the SIGMET was issued is no longer occurring or is no longer expected, the SIGMET shall be cancelled by issuing a SIGMET with the abbreviation CNL in lieu of meteorological information.
CNL SIGMET [n][n]n YYGGgg/YYGGgg

Source of Information

Source of Information	Phenomena
Surface and upper-air observations Special AIREP Satellite pictures NWP forecasts	Thunderstorms, dust/sandstorms, turbulence, mountain waves, icing
RADAR Lightning information	Thunderstorms
WMO RSMC (Atmospheric transport modelling for environmental emergency)	Radioactive cloud

SIGMET Dissemination

SIGMET is part of operational meteorological (OPMET) information and should be exchanged via aeronautical fixed service (AFS). The SIGMET priority indicator used shall be **FF**.

WS Examples

Format

WSAAii CCCC YYGGgg [BBB]
CCCC SIGMET [n][n]n VALID YYGGgg/YYGGgg CCCC-
CCCC <FIR/CTA Name> FIR <Phenomenon> OBS/FCST
[AT GGggZ] <Location> <Level> <Movement> <Intensity changes> <Forecast position>=

Thunderstorms

WSSS20 VHHH 090900
VHHK SIGMET 3 VALID 090900/091300 VHHH-
VHHK HONG KONG FIR EMBD TS OBS AT 0900Z N OF N2000 AND E OF E11330 TOP FL400 INTSF FCST 1300Z N OF N2000 AND E OF E11300=

Duststorms

WSAU21 ADRM 240330
YMMM SIGMET D01 VALID 240330/240430 YPDM-
YMMM MELBOURNE FIR HVY DS OBS WI S2300 E13415 – S2240 E13800 – S2520 E13800 – S2525 E13520 – S2300 E13415 SFC/7000FT MOV N 25KT NC=

Sandstorms

WSCI33 ZBAA 301110
ZBPE SIGMET 2 VALID 301110/301510 ZBAA-
ZBPE BEIJING FIR HVY SS OBS AT 1100Z N OF N40 SFC/2000M MOV E 30KMH NC=

Turbulence

WSNZ21 NZKL 232134
NZZC SIGMET 18 VALID 232134/240134 NZKL-
NZZC NEW ZEALAND FIR SEV TURB FCST WI S3929 E17602 – S4305 E17136 – S4522 E17000 – S4538 E17159 – S4112 E17624 – S3929 E17602 FL180/260 MOV E 25KT INTSF=

Mountain waves

WSAU21 AMRF 061700
YMMM SIGMET M07 VALID 061700/062100 YMRF-
YMMM MELBOURNE FIR SEV MTW OBS WI S3704 E14244 – S3611 E14753 – S3736 E14943 – S4006 E14800 – S3952 E14353 – S3704 E14244 FL080/140 STNR NC=

Icing

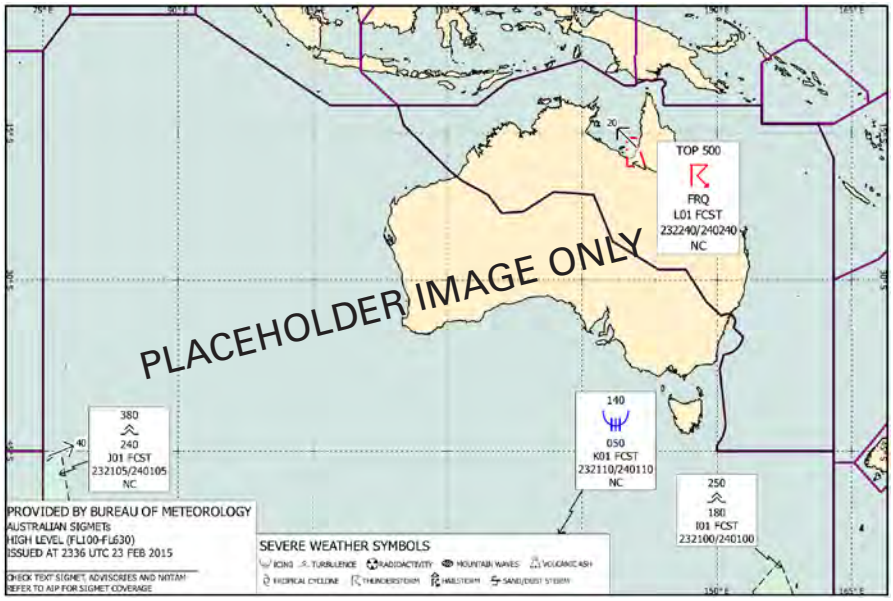
WSCI45 ZHHH 021100
ZHWH SIGMET 3 VALID 021100/021500 ZHHH-
ZHWH WUHAN FIR SEV ICE FCST N OF N28 SFC/FL200 STNR NC=

Radioactive cloud

WSSS20 VHHH 180830
VHHK SIGMET 1 VALID 180830/181230 VHHH-
VHHK HONG KONG FIR RDOACT CLD FCST E OF E114 SFC/FL100 MOV E 20KT WKN=

Cancellation

WSSS20 VHHH 181100
VHHK SIGMET 2 VALID 181100/181230 VHHH-
VHHK HONG KONG FIR CNL SIGMET 1 180830/181230=



PLACEHOLDER IMAGE ONLY

DRAFT 5

Australian Government
Bureau of Meteorology

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND

香港天文台
HONG KONG OBSERVATORY

References

ICAO *Annex 3/WMO Technical Regulation Vol II – Meteorological Service for International Air Navigation*

ICAO *Regional SIGMET Guide*

ICAO Doc.8896 – *Manual of Aeronautical Meteorological Practice*

WMO No.732 *Guide to Practices for Meteorological Offices Serving Aviation*

SIGMET QUICK REFERENCE GUIDE
WC SIGMET

DRAFT 4

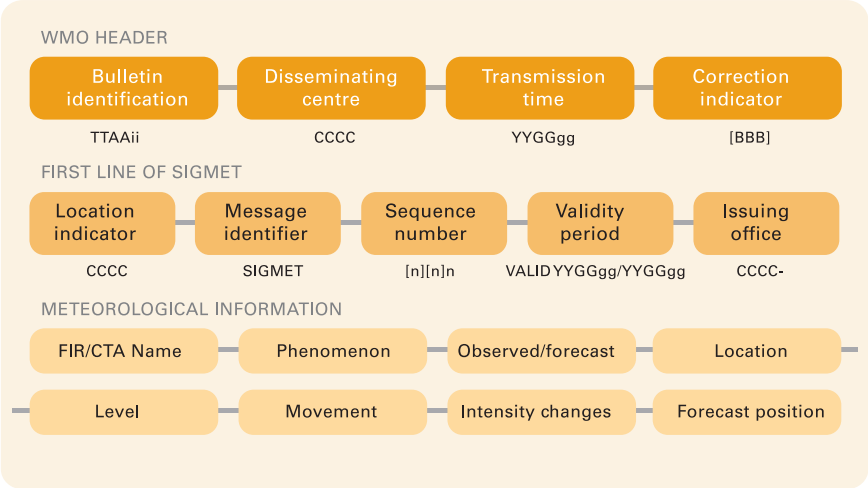
SIGMET Abbreviations

ABV	Above
BLW	Below
CB	Cumulonimbus cloud
CNL	Cancel or cancelled
CTA	Control area
FCST	Forecast
FIR	Flight Information Region
FL	Flight level
FT	Feet
INTSF	Intensify or intensifying
KT	Knots
KMH	Kilometres per hour
M	Metres
MOV	Moving
NC	No Change (in intensity)
NM	Nautical Miles
OBS	Observed
SFC	Surface
STNR	Stationary
TOP	Top (of CB cloud)
WI	Within (area)
WKN	Weakening (intensity)
Z	Coordinated Universal Time

WC SIGMET

A SIGMET provides concise information issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specific en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. The WC SIGMET provides information on tropical cyclones (intensity 34 knots or greater). WC SIGMET should be based on the Tropical Cyclone Advisory.

SIGMET Structure



WMO Header

Bulletin identification

TT	Data type designator	**WC** – for SIGMET for tropical cyclone
AA	Country or territory designators	Assigned according to Table C1, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)
ii	Bulletin number	Assigned on national level according to p 2.3.2.2, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)

Disseminating centre

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Transmission time

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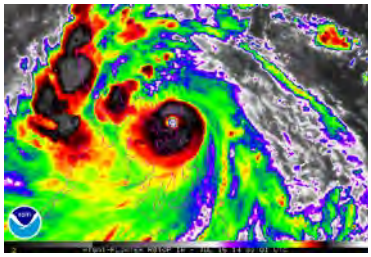
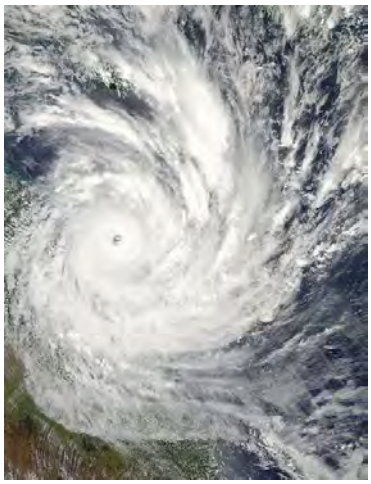


Typhoon Rammasun landfall in the Philippines on 15 July 2014. Image courtesy National Oceanic and Atmospheric Administration Satellite Services Division.

Damage from Supertyphoon Pongsona on the island of Rota, 20 December 2002. Image courtesy FEMA Photo Library, Andrea Booher.



Satellite image of Severe Tropical Cyclone Yasi approaching Queensland, Australia on 2 February 2011. Image courtesy NASA; MODIS.

Correction indicator

BBB should only be included when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall take the form **CCx** for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc., for a specific SIGMET.

First line of SIGMET

Location indicator

CCCC is the ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers.

Message identifier

The message identifier is **SIGMET**.

Sequence number

The daily sequence number in the form **[n][n]n**, e.g. 1, 2, 01, 02, A01, A02, restarts every day for SIGMETs issued from 0001 UTC.

Validity period

The validity period is given in the format **VALID YYGGgg/YYGGgg** where YY is the day of the month and GGgg is the time in hours and minutes UTC. For an observed TC, the start of validity for the SIGMET should be the same as the issue time. For a forecast TC, the start of validity should be the time the TC is expected to enter/develop in a MWO's FIR and can be issued no more than 12 hours prior to the start of validity. The validity period for a WC SIGMET shall be no more than 6 hours.

Issuing Office

CCCC- is the ICAO location indicator of the MWO originating the message followed by a hyphen.

Meteorological Information

FIR/CTA Name

The ICAO location indicator and full name of the FIR/CTA for which the SIGMET is issued in the form **CCCC <name> FIR[/UIR]** or **CCCC <name> CTA**.

Phenomenon

The description of the tropical cyclone consists of the abbreviation TC followed by the international name given by the corresponding WMO RSMC in the form **TC <name>**. If the disturbance is expected to become a TC, but is not yet named, the term **TC NN** should be used.

Observed or forecast

Whether the tropical cyclone is observed or forecast in the form **OBS [AT GGggZ]** or **FCST [AT GGggZ]** where GG is hours and gg minutes UTC.

Location

The location of the centre of the tropical cyclone is provided with reference to geographical coordinates in latitude and longitude in degrees and minutes.

Level

The vertical and horizontal extent of the tropical cyclone in the form:
CB TOP [ABV or **BLW] <FLnnn> WI <nnnKM** or **nnnNM> OF CENTRE**

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E	East or eastern longitude
ENE	East-north-east
ESE	East-south-east
N	North or northern latitude
NE	North-east
NNE	North-north-east
NNW	North-north-west
NW	North-west
S	South or southern latitude
SE	South-east
SSE	South-south-east
SSW	South-south-west
SW	South-west
W	West or western longitude
WNW	West-north-west
WSW	West-south-west

Typhoon Jelawat on 9 August 2000, showing clear Annular characteristics. Image courtesy NASA.

Movement

Direction and rate of movement of the tropical cyclone where the direction is given with reference to one of the sixteen points of the compass (using the appropriate abbreviation) and the rate is given in KT (or KMH) in the form **MOV <direction> <speed>KT** or **KMH**. The abbreviation **STNR** (Stationary) is used if no significant movement is expected.

Intensity changes

The expected evolution of the tropical cyclone's intensity as indicated by:
INTSF or **WKN** or **NC**

Forecast position (optional)

The forecast position of the tropical cyclone in the form: **FCST <GGgg>Z TC CENTRE <location>**.

Renewing a SIGMET

A SIGMET is renewed with a new sequence number when the validity period is due to expire but the tropical cyclone is expected to persist.

Cancelling a SIGMET

If, during the validity period of a SIGMET, the tropical cyclone intensity falls below 34 knots or if it has moved out of the FIR, the SIGMET shall be cancelled by issuing a SIGMET with the abbreviation CNL in lieu of meteorological information.
CNL SIGMET [n][n]n YYGGgg/YYGGgg
When cancelling a WC SIGMET consider the need for a WS SIGMET for thunderstorms.

Source of Information

Source of Information	Types of Information	Issue a WC SIGMET
MWO, TCAC	Observations that confirm a tropical cyclone has developed. Information concerning a tropical cyclone is received from a TCAC.	TC observed – issue immediately. TC forecast to enter/develop in MWOs FIR – issue up to 12 hours before the time the TC is expected to enter/develop in FIR.

SIGMET Dissemination

SIGMET is part of operational meteorological (OPMET) information and should be exchanged via aeronautical fixed service (AFS). The SIGMET priority indicator used shall be **FF**.

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TCA and WC SIGMET Examples

Tropical Cyclone Advisory (TCA) Example

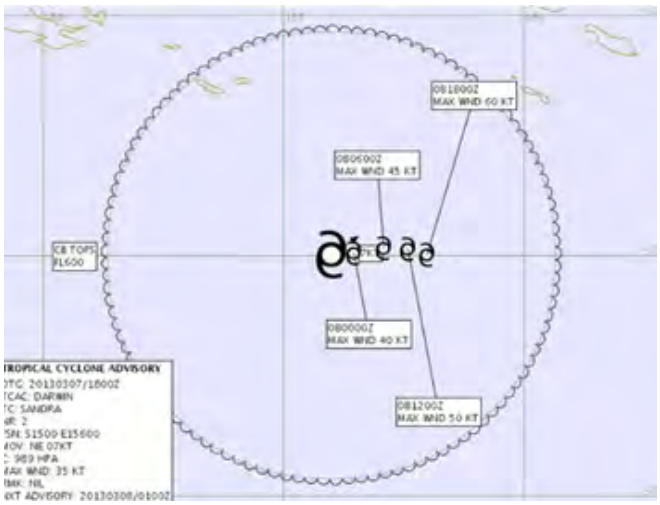
FKAU05 ADRM 071830
TC ADVISORY

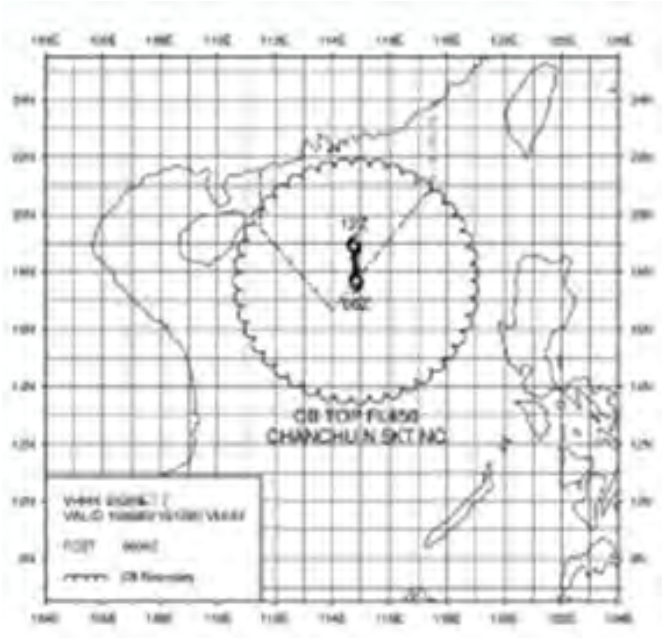
DTG:	20130307/1800Z
TCAC:	DARWIN
TC:	SANDRA
NR:	02
PSN:	S1500 E15600
MOV:	NE 07KT
C:	989HPA
MAX WIND:	35KT
FCST PSN +6HR:	08/0000Z S1500 E15630
FCST MAX WIND +6HR:	40KT
FCST PSN +12HR:	08/0600Z S1448 E15706
FCST MAX WIND +12HR:	45KT
FCST PSN +18HR:	08/1200Z S1454 E15736
FCST MAX WIND +18HR:	50KT
FCST PSN +24HR:	08/1800Z S1500 E15800
FCST MAX WIND +24HR:	60KT
RMK:	NIL
NXT MSG:	20130308/0100Z

FKPQ30 RJTD 151800
TC ADVISORY

DTG:	20060515/1800Z
TCAC:	TOKYO
TC:	CHANCHU
NR:	27
PSN:	N1555 E11500
MOV:	NNW 06KT
C:	930HPA
MAX WIND:	90KT
FCST PSN +6HR:	16/0000Z N1648 E11455
FCST MAX WIND +6HR:	90KT
FCST PSN +12HR:	16/0600Z N1740 E11450
FCST MAX WIND +12HR:	90KT
FCST PSN +18HR:	16/1200Z N1853 E11445
FCST MAX WIND +18HR:	90KT
FCST PSN +24HR:	16/1800Z N2005 E11440
FCST MAX WIND +24HR:	90KT
RMK:	NIL
NXT MSG:	200605/0000Z

Tropical Cyclone Advisory Graphic (TCG) Example





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> <Level> <Movement> <Intensity changes> <Forecast position>=

Tropical Cyclone SIGMET (WC) Example
WCAU01 ABRF 071910
YBBB SIGMET D02 VALID 071915/080115 YBRF-
YBBB BRISBANE FIR TC SANDRA OBS AT 1800Z S1500 E15600 CB TOP FL500 WI 280NM OF CENTRE MOV NE 07KT INTSF

Cancellation
WCAU01 ABRF 100515
YBBB SIGMET D12 VALID 100515/100715 YBRF-
YBBB BRISBANE FIR CNL SIGMET D06 100115/100715=

Tropical Cyclone SIGMET Example
WCPH31 RPLL 151800
RPHI SIGMET 4 VALID 151800/160000 RPLL-
RPHI MANILA FIR TC CHANCHU OBS AT 1800Z N1555 E11500 CB TOP FL450 WI 240NM OF CENTRE NC FCST 0000Z TC CENTRE N1648 E11455=

Tropical Cyclone SIGMET Example
WCSS20 VHHH 151900
VHHK SIGMET 7 VALID 160600/161200 VHHH-
VHHK HONG KONG FIR TC CHANCHU FCST AT 0600Z N1740 E11450 CB TOP FL450 WI 240NM OF CENTRE NC FCST 1200Z TC CENTRE N1853 E11445=

Australian Government
Bureau of Meteorology

CAA CIVIL AVIATION AUTHORITY OF NEW ZEALAND

香港天文台 HONG KONG OBSERVATORY

References
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ICAO Doc.8896 – *Manual of Aeronautical Meteorological Practice*
WMO No.732 *Guide to Practices for Meteorological Offices Serving Aviation*