ESCAP/WMO
Typhoon Committee

FOR PARTICIPANTS ONLY

WRD/TC.46/6.2
29 January 2014

Forty-sixth Session
10-13 February 2014
Bangkok, Thailand

ENGLISH ONLY

REPORT ON AMENDMENTS TO THE TYPHOON COMMITTEE OPERATIONAL MANUAL

(Item 6.2 of the Provisional Agenda)

Submitted by the Rapporteur

Introduction

1. The Typhoon Committee Operational Manual - Meteorological Component (TOM) has been reviewed and updated every year since its first issue in 1987. The 2013 edition was completed and posted on the WMO website in February 2013 in accordance with the approval of amendments to the 2012 edition by the 45th session of the Typhoon Committee (29 January to 1 February 2013 Hong Kong, China).

2. At the 45th session, the Committee decided that the rapporteur of the Japan Meteorological Agency (JMA) continue arrangements for updating the TOM. In this connection, on 5 September 2013, the rapporteur, Mr Tsukasa Fujita, Head of the JMA Tokyo Typhoon Center invited the focal points of the meteorological component of the Members to provide proposals for updates to the TOM.

3. As of the end of January 2014, proposals for updates to the TOM had been submitted by the two focal points of Japan and Thailand.

4. Proposed amendments to the TOM are attached as Annex 1 and given below are the major points of the amendments:

- Update of information on technical specifications of radars in Japan and the JMA's next generation satellite Himawari-8 (Chapter 2)
- Update of information on NWP products (GSM and EPS) provided by RSMC Tokyo (Chapter 3)
- Update of information on telecommunication network (Chapter 5)

Action Proposed

5. The Committee is invited to review and approve the proposed amendments to the TOM attached as Annex 1 with necessary modifications.

Annex 1

Draft Amendments to
the Typhoon Committee Operational Manual – Meteorological Component (TOM)
proposed by the Members

Page	Line	Proposed Amendment	Comments
Chapter 2.4			
10	L11 - 17	JMA plans to launch Himawari-8 in 2014 and start its operation in 2015 to replace the current satellite, MTSAT-2. ~~MTSAT-1R will be retired in 2015, and JMA will terminate the HRIT/LRIT direct dissemination service via MTSAT-1R at the same time.~~ Himawari-8 will not carry a device for direct ~~data~~ dissemination system~~.~~, ~~and image data~~ Instead, imagery from Himawari-8 ~~it~~ will be available via the Internet ~~JMA's website and other online resources~~. The Agency will also disseminate a primary set of imagery for operational meteorological services via ~~has been assessing the feasibility of data dissemination using~~ a commercial telecommunication satellite, and tentatively plans to begin this service in 2015 in parallel with the direct dissemination of imagery from MTSAT-2 via MTSAT-1R which will be terminated after the successful transition to Himawari-8. Further information on Himawari-8 and -9 is available at the website of Meteorological Satellite Center of JMA (http://mscweb.kishou.go.jp/himawari89/~~index.html~~).	Updated based on the latest plan of Himawari 8/9. Data of Himawari 8 are planned to be disseminated via commercial satellites.
Chapter 3.1			
13	Table 3.1	To be replaced by Annex 1-1	JCDAS products are removed from the list of RSCM products in Table 3.1 just because of its little relevance to TCs, while they continue to be
14	Figure		

	3.1		distributed via GTS as before. Figure 3.1. is updated accordingly.
15	Table 3.2	To be replaced by Annex 1-2	The frequency of issuance of the one-week EPS products will be increased from once to twice a day with decrease in the number of ensemble members from 51 to 27, from February 2014.
14	Table 3.3	To be replaced by Annex 1-3	Forecast Time of Global Wave Model has been extended to 264 hours.
Chapter 5.4			
23	Table 5.1 L10	Beijing 4 ~~3~~ Mbps/Tokyo 10 Mbps	
	L12	48 kbps (MPLS ~~CIR~~) TCP/IP	
	L13	Beijing 4 Mbps/Offenbach 8 Mbps	
Appendix 2-D			
4, 7		To be replaced by Annex 1-4	New Doppler radar systems have been installed at three radar sites (Naze, Nagano, and Shizuoka)
Appendix 2-E			
23		(http://www.jma.go.jp/jma/jma-eng/satellite/introduction/4_2HRIT.pdf) ~~(http://www.jma.go.jp/jma/jma-eng/satellite/mtsat1r/4.2HRIT_1.pdf)~~	URL is changed.
34		(http://www.jma.go.jp/jma/jma-eng/satellite/introduction/4_3LRIT.pdf) ~~(http://www.jma.go.jp/jma/jma-eng/satellite/mtsat1r/4.3LRIT.pdf)~~	URL is changed.
5	Figure 2-E.1	To be replaced by Annex 1-5	D0-Fhh (Full disk visible imagery) has been disseminated since 2010. D0-Fhh is to be inserted into "3. LRIT Dissemination".
6			Same as above. D0-Fhh is to be included into the table D. Data disseminated in LRIT.
Appendix 3-A			
1	31	84 hours from 0000, 0600 and 1800 UTC, and 264 ~~216~~ hours from 1200 UTC	Forecast Time of GSM has been extended to 264 hours since March 2013.
Appendix 5-A			
3	Thailand	To be updated as shown in Annex 1-6	
Appendix 5-D			
		To be updated as shown in Annex 1-7	Just minor correction. WC, Tropical cyclone (SIGMET) would be more appropriate to be listed here. WS is SIGMET for phenomena other than tropical cyclone and volcanic ash.

Annex 1-1

Table 3.1 Chart-form products provided by RSMC Tokyo - Typhoon Center for regional purposes

Model	Area	Contents and Level	Forecast hours	Initial time	Availability
Global Analysis/Forecast Models	A' (Far East)	500hPa (Z, ζ)	Analysis	00, 12UTC	GTS
			24, 36	00, 12UTC	GTS, JMH
		500hPa (T), 700hPa (D)	24, 36	00, 12UTC	GTS, JMH
		700hPa (ω), 850hPa (T, A)	Analysis	00, 12UTC	GTS
			24, 36	00, 12UTC	GTS, JMH
		Surface (P, R, A)	24, 36	00, 12UTC	GTS, JMH
	C (East Asia)	300hPa (Z, T, W, A)	Analysis	00UTC	GTS
		500hPa (Z, T, A)	Analysis	00, 12UTC	GTS, JMH
		500hPa (Z, ζ)	48, 72	00, 12UTC	GTS
		700hPa (Z, T, D, A)	Analysis	00, 12UTC	GTS
		700hPa (ω), 850hPa (T, A)	48, 72	12UTC	GTS
		850hPa (Z, T, D, A)	Analysis	00, 12UTC	GTS, JMH
		Surface (P, R)	24, 48, 72	00, 12UTC	GTS, JMH
			96, 120	12UTC	JMH
	O (Asia)	500hPa (Z, ζ)	96, 120, 144, 168, 192	12UTC	GTS
		850hPa (T), Surface (P)			
	Q (Asia Pacific)	200hPa (Z, T, W), Tropopause (Z)	Analysis	00, 12UTC	GTS
		250hPa (Z, T, W)	Analysis, 24	00, 12UTC	
		500hPa (Z, T, W)		00, 12UTC	
	D (N.H.)	500hPa (Z, T)	Analysis	12UTC	GTS
	W (NW Pacific)	200hPa (streamline)	Analysis, 24, 48	00, 12UTC	GTS
		850hPa (streamline)		00, 12UTC	
Ocean Wave	C'' (NW Pacific)	Surface (height, period and direction)	12, 24, 48, 72	00, 12UTC	GTS, JMH
SST	C	Sea Surface Temperature	Daily analysis	-	JMH

Notes:

(a) Area

A', C, O, Q, D, W, and C'' are illustrated in Figure 3.1.

(b) Contents

Z: geopotential height ζ: vorticity T: temperature
D: dewpoint depression ω: vertical velocity W: wind speed by isotach
A: wind arrows P: sea level pressure R: rainfall

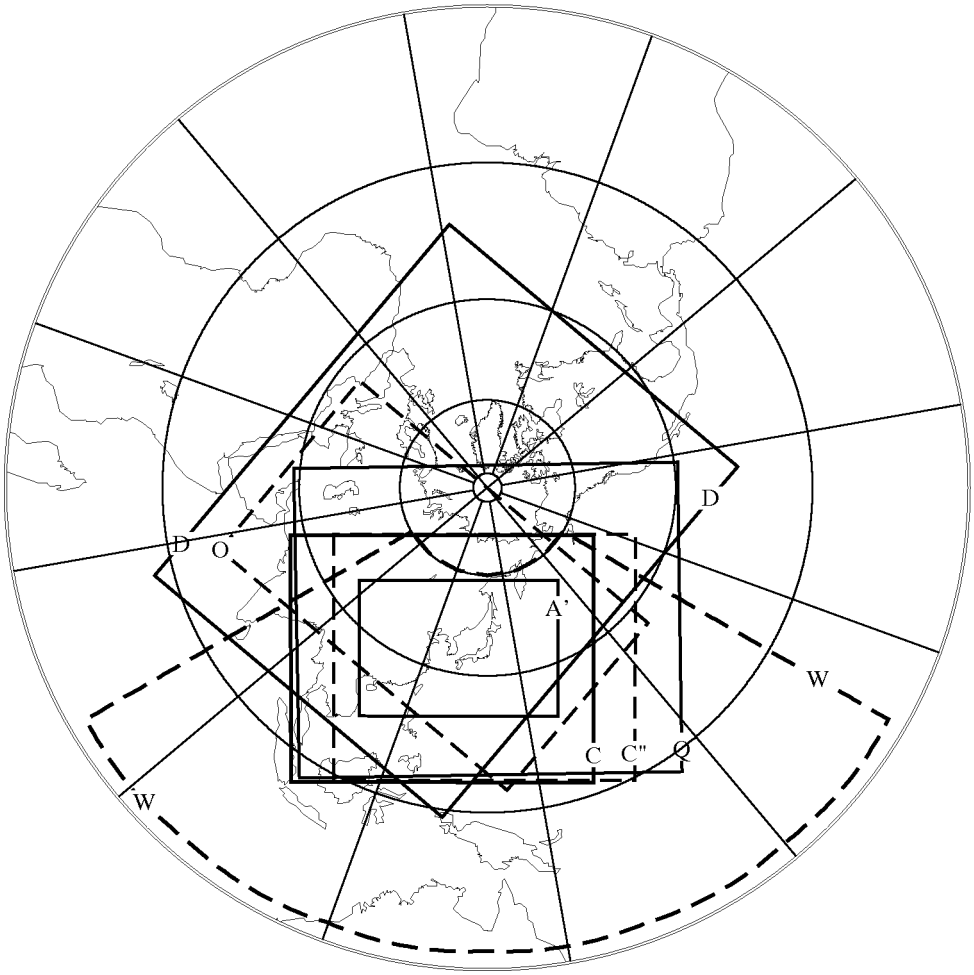

Figure 3.1 Output areas for facsimile charts transmitted through GTS and radio facsimile JMH

Annex 1-2

Table 3.2 NWP products (GSM and EPS) provided by RSMC Tokyo - Typhoon Center
(Available at http://www.wis-jma.go.jp/cms/)

Model	GSM	GSM	GSM
Area and resolution	Whole globe, 1.25°×1.25°	20°S–60°N, 60°E–160°W 1.25°×1.25°	Whole globe, 2.5°×2.5°
Levels and elements	10 hPa: Z, U, V, T 20 hPa: Z, U, V, T 30 hPa: Z, U, V, T 50 hPa: Z, U, V, T 70 hPa: Z, U, V, T 100 hPa: Z, U, V, T 150 hPa: Z, U, V, T 200 hPa: Z, U, V, T, ψ, χ 250 hPa: Z, U, V, T 300 hPa: Z, U, V, T, H, ω 400 hPa: Z, U, V, T, H, ω 500 hPa: Z, U, V, T, H, ω, ζ 600 hPa: Z, U, V, T, H, ω 700 hPa: Z, U, V, T, H, ω 850 hPa: Z, U, V, T, H, ω, ψ, χ 925 hPa: Z, U, V, T, H, ω 1000 hPa: Z, U, V, T, H, ω Surface: P, U, V, T, H, R†	10 hPa: Z, U, V, T 20 hPa: Z, U, V, T 30 hPa: Z, U, V, T 50 hPa: Z, U, V, T 70 hPa: Z, U, V, T 100 hPa: Z, U, V, T 150 hPa: Z, U, V, T 200 hPa: Z§, U§, V§, T§, ψ, χ 250 hPa: Z, U, V, T 300 hPa: Z, U, V, T, D 400 hPa: Z, U, V, T, D 500 hPa: Z§, U§, V§, T§, D§, ζ 700 hPa: Z§, U§, V§, T§, D§, ω 850 hPa: Z§, U§, V§, T§, D§, ω, ψ, χ 925 hPa: Z, U, V, T, D, ω 1000 hPa: Z, U, V, T, D Surface: P¶, U¶, V¶, T¶, D¶, R¶	10 hPa: Z*, U*, V*, T* 20 hPa: Z*, U*, V*, T* 30 hPa: Z°, U°, V°, T° 50 hPa: Z°, U°, V°, T° 70 hPa: Z°, U°, V°, T° 100 hPa: Z°, U°, V°, T° 150 hPa: Z*, U*, V*, T* 200 hPa: Z, U, V, T 250 hPa: Z°, U°, V°, T° 300 hPa: Z, U, V, T, D*‡ 400 hPa: Z*, U*, V*, T*, D*‡ 500 hPa: Z, U, V, T, D*‡ 700 hPa: Z, U, V, T, D 850 hPa: Z, U, V, T, D 1000 hPa: Z, U*, V*, T*, D*‡ Surface: P, U, V, T, D‡, R†
Forecast hours	0–84 every 6 hours and 96–192 every 12 hours † Except analysis	0–84 (every 6 hours) § 96–192 (every 24 hours) for 12UTC initial ¶ 90–192 (every 6 hours) for 12UTC initial	0–72 every 24 hours and 96–192 every 24 hours for 12UTC ° 0–120 for 12UTC † Except analysis * Analysis only
Initial times	00, 06, 12, 18UTC	00, 06, 12, 18UTC	00UTC and 12UTC ‡ 00UTC only

Model	**One-week EPS**
Area and resolution	Whole globe, 2.5°×2.5°
Levels and elements	250 hPa: μU, σU, μV, σV 500 hPa: μZ, σZ 850 hPa: μU, σU, μV, σV, μT, σT 1000 hPa: μZ, σZ Surface: μP, σP
Forecast hours	0–192 every 12 hours
Initial times	**00,** 12UTC

Model	GSM	GSM
Area and resolution	5S-90N and 30E-165W, Whole globe 0.25° × 0.25°	5S-90N and 30E-165W, Whole globe 0.5° × 0.5°
Levels and elements	Surface: U, V, T, H, P, Ps, R, Cla, Clh, Clm, Cll	10 hPa: Z, U, V, T, H, ω 20 hPa: Z, U, V, T, H, ω 30 hPa: Z, U, V, T, H, ω 50 hPa: Z, U, V, T, H, ω 70 hPa: Z, U, V, T, H, ω 100 hPa: Z, U, V, T, H, ω 150 hPa: Z, U, V, T, H, ω 200 hPa: Z, U, V, T, H, ω, ψ, χ 250 hPa: Z, U, V, T, H, ω 300 hPa: Z, U, V, T, H, ω 400 hPa: Z, U, V, T, H, ω 500 hPa: Z, U, V, T, H, ω, ζ 600 hPa: Z, U, V, T, H, ω 700 hPa: Z, U, V, T, H, ω 800 hPa: Z, U, V, T, H, ω 850 hPa: Z, U, V, T, H, ω, ψ, χ 900 hPa: Z, U, V, T, H, ω 925 hPa: Z, U, V, T, H, ω 950 hPa: Z, U, V, T, H, ω 975 hPa: Z, U, V, T, H, ω 1000 hPa: Z, U, V, T, H, ω Surface: U, V, T, H, P, Ps, R, Cla, Clh, Clm, Cll
Forecast hours	0-84 (every 6 hours) **90– 264 (every 6 hours) are available for 12 UTC Initial**	0-84 (every 6 hours) **90– 264 (every 6 hours) are available for 12 UTC Initial**
Initial times	00, 06, 12, 18 UTC	00, 06, 12, 18 UTC

Notes: Z: geopotential height U: eastward wind V: northward wind
T: temperature D: dewpoint depression H: relative humidity
ω: vertical velocity ζ: vorticity ψ: stream function
χ: velocity potential P: sea level pressure Ps: pressure
R: rainfall Cla: total cloudiness Clh: cloudiness (upper layer)
Clm: cloudiness(middle layer) Cll: cloudiness (lower layer)

The prefixes μ and σ represent the average and standard deviation of ensemble prediction results respectively.

The symbols °, *, ¶, §, ‡ and † indicate limitations on forecast hours or initial time as shown in the tables.

Table 3.3 List of other products provided by RSMC Tokyo - Typhoon Center
(Available at http://www.wis-jma.go.jp/cms/)

Data	Contents / frequency (initial time)
Satellite products	High density atmospheric motion vectors (BUFR) (a) MTSAT-2 (VIS, IR, WV), 60S-60N, 90E-170W VIS: every hour (00-09, 21-23 UTC), IR and WV: every hour (b) METEOSAT-7 (VIS, IR, WV) VIS: every 1.5 hours between 0130 and 1500 UTC IR and WV: every 1.5 hours Clear Sky Radiance (CSR) data (BUFR) MTSAT-2 (IR, WV) radiances and brightness temperatures averaged over cloud-free pixels: every hour
Tropical cyclone Information	Tropical cyclone related information (BUFR) • tropical cyclone analysis data (00, 06, 12 and 18 UTC)
Wave data	Global Wave Model (GRIB2) • significant wave height • prevailing wave period • wave direction Forecast hours: 0–84 every 6 hours (00, 06 and 18UTC) 0–84 every 6 hours and 96-**264** every 12 hours (12 UTC)
Observational data	(a) Surface data (TAC/TDCF) SYNOP, SHIP, BUOY: Mostly 4 times a day (b) Upper-air data (TAC/TDCF) TEMP (parts A-D), PILOT (parts A-D): Mostly twice a day
Storm surge	Storm surge model for Asian area • storm surge distribution (map image) • time series charts (at requested locations) The plotted values are storm surges, predicted water levels, astronomical tides, surface winds, and sea level pressures. Forecast hours: 0–72 every 3 hours (00, 06 12, and 18UTC) Only in the case of a tropical cyclone being in the forecast time (Available at https://tynwp-web.kishou.go.jp/)
SATAID service	(a) Satellite imagery (SATAID) MTSAT (b) Observation data (SATAID) SYNOP, SHIP, METAR, TEMP (A, B) and ASCAT sea-surface wind (c) NWP products (SATAID) GSM (Available at http://www.wis-jma.go.jp/cms/sataid/)

Annex 1-4

APPENDIX 2-D, p.4
Name of the Member **Japan - 2**

NAME OF STATION		Tokyo /Kashiwa	Niigata /Yahikoyama	Fukui /Tojimbo	Nagano /Kurumayama	Shizuoka /Makinohara
SPECIFICATIONS	Unit					
Index number		47695	47572	47705	47611	47659
Location of station		35° 52′ N 139° 58′ E	37° 43′ N 138° 49′ E	36° 14′ N 136° 09′ E	36° 06′ N 138° 12′ E	34° 45′ N 138° 08′E
Antenna elevation	m	74.0	645.0	107.0	1937.1	186.0
Wave length	cm	5.59	5.61	5.59	5.64	5.66
Peak power of transmitter	kW	250	250	250	250	250
Pulse length	μs	1.1/2.6	1.0/2.6	1.1/2.7	**1.0/2.6**	**1.1/2.6**
Sensitivity minimum of receiver	dBm	-109/-113	-109/-113	-109/-113	**-110/-114**	**-110/-113**
Beam width (Width of over -3dB antenna gain of maximum)	deg	1.0(H) 1.0(V)	1.0(H) 1.0(V)	1.1(H) 1.0(V)	**1.1(H)** **1.0(V)**	**1.1(H)** **1.1(V)**
Detection range	km	400	400	400	400	400
Scan mode in observation 1.Fixed elevation 2.CAPPI 3.Manually controlled		2	2	2	2	2
DATA PROCESSING						
MTI processing 1.Yes, 2.No		1	1	1	1	1
Doppler processing 1.Yes, 2.No		1	1	1	**1**	**1**
Display 1.Digital, 2.Analog		1	1	1	1	1
OPERATION MODE (When tropical cyclone is within range of detection)		1	1	1	1	1

1.Hourly 2.3-hourly 3.Others					
PRESENT STATUS 1.Operational 2.Not operational (for research etc.)	1	1	1	1	1

NAME OF STATION		Fukuoka /Sefurisan	Tanegashima /Nakatane	Naze /Funchatoge	Naha /Itokazu	Ishigakijima /Omotodake
SPECIFICATIONS	Unit					
Index number		47806	47869	47909	47937	47920
Location of station		33° 26′ N 130° 21′ E	30° 38′ N 130° 59′ E	28° 24′ N 129° 33′ E	26° 09′ N 127° 46′ E	24° 26′ N 124° 11′E
Antenna elevation	m	982.7	290.5	**318.8**	208.2	535.5
Wave length	cm	5.60	5.60	5.66	5.60	5.61
Peak power of transmitter	kW	250	250	250	250	250
Pulse length	μs	1.1/2.7	1.1/2.7	**1.1/2.6**	1.0/2.5	1.1/2.7
Sensitivity minimum of receiver	dBm	-109/-112	-108/-112	**-109/-113**	-109/-113	-107/-111
Beam width (Width of over -3dB antenna gain of maximum)	deg	1.0(H) 1.0(V)	1.1(H) 1.0(V)	**1.1(H)** **1.0(V)**	1.0(H) 1.0(V)	1.1(H) 1.1(V)
Detection range	km	400	400	400	400	400
Scan mode in observation 1.Fixed elevation 2.CAPPI 3.Manually controlled		2	2	2	2	2
DATA PROCESSING						
MTI processing 1.Yes, 2.No		1	1	1	1	1
Doppler processing 1.Yes, 2.No		1	1	**1**	1	1
Display 1.Digital, 2.Analog		1	1	1	1	1
OPERATION MODE (When tropical cyclone is within range of		1	1	1	1	1

detection) 1.Hourly 2.3-hourly 3.Others					
PRESENT STATUS 1.Operational 2.Not operational(for research etc.)	1	1	1	1	1

B. Legend

Observation (full disk/half disk)
HRIT
LRIT

C. Symbols

hh: hours in UTC

1. Observation

Symbol	Observation	Explanation of symbol
Fhh	Hourly full disk	F: hourly Full-disk observation
Nhh	Hourly Northern Hemisphere	N: hourly Northern-hemisphere observation
NhhW Shh ShhW	Special observations for wind extraction	W: Wind extraction; S: Southern-hemisphere observation. Every 6 hours (00, 06, 12, 18 UTC), two Northern-hemisphere and two Southern-hemisphere observations will be performed before and after the full-disk observation respectively. As an example, observations for wind extraction around 12 UTC are N11, N11W, F12, S12 and S12W.

2. HRIT Dissemination

Symbol	Observation	Explanation of symbol
Fhh	Hourly full disk	F: hourly Full-disk observation
Nhh	Hourly Northern Hemisphere	N: hourly Northern-hemisphere observation
NhhW Shh ShhW	Special observations for wind extraction	W: Wind extraction; S: Southern-hemisphere observation. Every 6 hours (00, 06, 12, 18 UTC), two Northern-hemisphere and two Southern-hemisphere observations will be performed before and after the full-disk observation respectively. As an example, observations for wind extraction around 12 UTC are N11, N11W, F12, S12 and S12W.

3. LRIT Dissemination

Symbol	Observation	Explanation of symbol
D1-Fhh	Full disk	D1: Full- Disk imagery, Infrared-ch 1; F: hourly Full-disk observation
D3-Fhh		D3: Full- Disk imagery, Infrared-ch 3; F: hourly Full-disk observation
D0-Fhh		D0: Full- Disk imagery, Visible ; F: hourly Full-disk observation
PS-Fhh		PS: Polar-Stereographic imagery; F: hourly Full-disk observation; N: hourly Northern-hemisphere observation.
PS-Nhh	Northern Hemisphere	There are three different sets of polar-stereographic imagery covering East Asia, northeast Japan and southwest Japan.

Figure 2-E.1 Time Table for Operation of MTSAT-2 (4/5)

D. Data disseminated in LRIT

Region / Observation	Polar-stereographic projection (PS-Fhh / PS-Nhh)						Full disk		
	East Asia Visible	East Asia Infrared-ch1	East Asia Infrared-ch3	East Asia Infrared-ch4	The northeast of Japan Visible	The southwest of Japan Visible	Infrared-ch1 (D1-Fhh)	Infrared-ch3 (D3-Fhh)	Visible (D0-Fhh)
F00	D	D	D		D	D	D	D	D
F01	D	D	D		D	D	D		D
N01	D	D	D		D	D			
F02	D	D	D		D	D	D		D
N02	D	D	D		D	D			
F03	D	D	D		D	D	D		D
N03	D	D	D		D	D			
F04	D	D	D		D	D	D		D
N04	D	D	D		D	D			
F05	D	D	D		D	D	D		D
N05	D	D	D		D	D			
F06	D	D	D		D	D	D	D	D
F07	D	D	D		D	D	D		D
N07	D	D	D		D	D			
F08	(D)	D	D	(D)	(D)	(D)	D		D
N08	(D)	D	D	(D)	(D)	(D)			
F09	(D)	D	D	(D)	(D)	(D)	D		D
N09	(D)	D	D	(D)	(D)	(D)			
F10		D	D	D			D		D
N10		D	D	D					
F11		D	D	D			D		D
N11		D	D	D					
F12		D	D	D			D	D	D
F13		D	D	D			D		D
N13		D	D	D					
F14		D	D	D			D		D
N14		D	D	D					
F15		D	D	D			D		D
N15		D	D	D					
F16		D	D	D			D		D
N16		D	D	D					
F17		D	D	D			D		D
N17		D	D	D					
F18		D	D	D			D	D	D
F19		D	D	D			D		D
N19		D	D	D					
F20		D	D	D			D		D
N20		D	D	D					
F21	(D)	D	D	(D)	(D)	(D)	D		D
N21	(D)	D	D	(D)	(D)	(D)			
F22	(D)	D	D	(D)	(D)	(D)	D		D
N22	(D)	D	D	(D)	(D)	(D)			
F23	D	D	D		D	D	D		D
N23	D	D	D		D	D			

D: Dissemination

(D): Visible images will be disseminated when the days are long enough, while infrared-ch4 images will be disseminated when days are short enough. See MANAM for updated information.

E. Observation channels of the MTSAT imager

Channel		Wavelength
Infrared	ch1	10.3 - 11.3 μm
	ch2	11.5 - 12.5 μm
	ch3	6.5 - 7.0 μm
	ch4	3.5 - 4.0 μm
Visible		0.55 - 0.90 μm

Figure 2-E.1 Time Table for Operation of MTSAT-2 (5/5)

Annex 1-6

APPENDIX 5-A, p.1

LIST OF ADDRESSES, TELEX/CABLE AND TELEPHONE NUMBERS OF THE TROPICAL CYCLONE WARNING CENTERS IN THE REGION

Centre numbers	Mailing address	Telex/cable, Telephone, fax
Thailand		
Thai Meteorological Department (**Director-General: Mr. Worapat Tiewthanom**)	4353 Sukhumvit Road Bangkok 10260 E-mail:**wopapat.t@tmd.go.th**	Tel.: (+66) (2) 366 6325 Fax.: (+66) (2) 399 4020 tmd_inter@tmd.go.th
Weather Forecast Bureau Thai Meteorological Department 4012-4 (**Director: Mr. Prawit Jampanya**) **jampanya@tmd.go.th**,	4353 Sukhumvit Road Bangkok 10260	Tel.: (+66) (2) 398 9830 Fax: (+66) (2) 398 9836 Tel&Fax:(+66) (2) 399 E-mail: tmd_inter@tmd.go.th
Telecommunications and Information Technology Bureau Thai Meteorological Department (Director : Gp. Capt. Sarun Dabbhasuta)	4353 Sukhumvit Road Bangkok 10260 E-mail: Sarun.d@mict.mail.go.th,	Tel.: (+66) (2) 399 4555 Fax: (+66) (2) 398 9861 tmd_inter@tmd.go.th

Annex 1-7
APPENDIX 5-D

TABLE of Abbreviated headings (TTAAii CCCC)

TT	Data designator
FX	Miscellaneous forecasts
SB	Radar reports PART A
SC	Radar reports PART B
SD	Radar reports (PART A and PART B)
SN	Synoptic reports (non-standard hours)
TP	Satellite guidance
UA	Aircraft reports (AIREP)
UE	Upper-level observation, PART D
UK	Upper-level observation, PART B
UL	Upper-level observation, PART C
US	Upper-level observation, PART A
WD	Prognostic reasoning for typhoon
WH	Hurricane warnings
WO	Other warnings
WC	**Tropical cyclone(SIGMET)**
WT	Tropical cyclone warnings
WW	Warning and weather summary

ii	Data distribution area
01-19	Global
20-39	Regional
40-89	National

TABLE of Abbreviated Headings
(TTAAii CCCC) for BUFR

TTAAii CCCC	Data type
ISBC01 VHHH	Radar reports
ISBC01 RJTD	Radar reports
IUCC10 RJTD	SAREP reports

AA	Geographic designator
CI	China
HK	Hong Kong
JP	Japan
KO	Republic of Korea
KP	Cambodia
LA	Lao People's Democratic Republic
MS	Malaysia
MU	Macao
PA	Pacific
PH	Philippines
PN	North Pacific area
PQ	Western North Pacific
PW	Western Pacific area
SS	South China Sea area
TH	Thailand
VS	Viet Nam

CCCC	Location indicator
BABJ	Beijing
BCGZ	Guangzhou
KWBC	Washington
PGFA	Guam (F.W.C)
PGTW	Guam (JTWC)
PGUM	Guam (Agana)
RJTD	Tokyo
RJTY	Yokota
RKSL	Seoul
RKSO	Osan
RODN	Okinawa / Kadena AB
RPMK	Clark AB
RPMM	Manila / Intl.
VDPP	Phnom Penh
VHHH	Hong Kong
VLIV	Vientiane
VMMC	Macao
VNNN	Hanoi
VTBB	Bangkok
WMKK	Kuala Lumpur