Bulletins issued

By

Regional Specialised Meteorological Centre (RSMC) –

Tropical Cyclones, New Delhi

Cyclone Warning Division,

India Meteorological Department

Mausam Bhavan, Lodi Road, New Delhi-110003

Bulletins issued by Regional Specialised Meteorological Centre(RSMC), New Delhi

RSMC, New Delhi issues the following bulletins during the occurrence of cyclonic disturbances over the north Indian Ocean.

1. Tropical Weather Outlook
2. Special Tropical Weather Outlook
3. Tropical Cyclone Advisory
4. Tropical Cyclone Advisory Centre(TCAC) Bulletin

The area of responsibility for the issue of tropical cyclone advisories by RSMC Tropical Cyclones, New Delhi cover sea areas of north Indian Ocean between 45° E to 100° E.

1. Tropical weather outlook

The tropical weather outlook is prepared once daily by RSMC tropical cyclones, New Delhi throughout the year. It is being transmitted on the Global Telecommunication System (GTS) at 06 UTC every day. The outlook covering the Bay of Bengal and the Arabian Sea indicates possible development of tropical depressions over the sea.

2. Special Tropical weather outlook

An additional outlook is issued again over the GTS at 1500 UTC when a depression is formed over the north Indian Ocean. The Special Tropical weather outlook provides brief descriptions of tropical depressions affecting the area broadly. It gives the location, intensity and movement of the system as well as a general statement of land areas coming under threat. It also includes the physical reasoning about the prognosis and diagnosis of the system. An example of Special Tropical weather outlook is given below.

DEMS–RSMC TROPICAL CYCLONES NEW DELHI (24-05-2009). TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 24 HOURS ISSUED AT 0600 UTC OF 24 MAY, 2009 BASED ON 0300 UTC OF 24 MAY, 2009 (.)

THE DEPRESSION OVER WEST CENTRAL & ADJOINING EAST CENTRAL BAY OF BENGAL INTENSIFIED INTO A DEEP DEPRESSION, MOVED NORTHWARDS AND LAY CENTRED AT 0300 UTC OF TODAY, THE 24TH MAY 2009 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL AND NORTHWEST BAY OF BENGAL NEAR LAT. 18.0^{0} N AND LONG. 88.5^{0} E, ABOUT 350 KM SOUTHEAST OF PARADIP (42976), 400 KM SOUTH SOUTHEAST OF SAGAR ISLAND (42903) AND 470 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984).

SATELLITE IMAGERY INDICATES FURTHER ORGANISATION OF THE SYSTEM. THE INTENSITY OF THE SYSTEM IS T2.0 ASSOCIATED BROKEN INTENSE TO VERY INTENSE CONVECTION OBSERVED OVER THE BAY OF BENGAL NORTH OF LAT. 10.0^{0} N AND WEST OF LONG. 91.0^{0} E. THE LOWEST CLOUD TOP TEMPERATURE (CTT) DUE TO CONVECTION IS ABOUT -80^{0}C TO THE SOUTHWEST OF THE SYSTEM CENTRE.

SUSTAINED MAXIMUM SURFACE WIND SPEED IS ESTIMATED TO BE ABOUT 30 KNOTS GUSTING TO 40 KNOTS. STATE OF THE SEA IS VERY ROUGH AROUND THE SYSTEM CENTRE. ESTIMATED CENTRAL PRESSURE IS ABOUT 992 HPA.

VERTICAL WIND SHEAR OF HORIZONTAL WIND OVER THE REGION IS AROUND 20 KNOTS. THE SYSTEM LIES VERY CLOSE TO THE UPPER TROPOSPHERIC RIDGE, WHICH ROUGHLY RUNS ALONG 19^{0}N IN ASSOCIATION WITH THE ANTICYCLONIC CIRCULATION OVER MYANMAR AND

ADJOINING EAST CENTRAL BAY LOCATED TO THE EAST-NORTHEAST OF THE SYSTEM CENTRE. THERE IS AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES ROUGHLY RUNNING ALONG 79^0 E TO THE NORTH OF 20^0 N. SEA SURFACE TEMPRATURES ARE WARMER OVER NORTH & CENTRAL BAY OF BENGAL. MAJORITY OF NWP MODELS ALSO SUGGEST INTENSIFICATION OF THE SYSTEM AND LANDFALL OVER WEST BENGAL AND ADJOINING BANGLADESH COAST NEAR LONG.89.0^0E.

CONSIDERING ALL THE ABOVE, THE SYSTEM IS LIKELY TO INTENSIFY FURTHER AND MOVE IN A NEAR NORTHERLY DIRECTION AND CROSS WEST BENGAL-BANGLADESH COAST NEAR LATITUDE 89^0 E (ABOUT 100 KM EAST OF SAGAR ISLAND) BETWEEN 1200 AND 1500 UTC OF 25^{TH} MAY 2009.

BASED ON LATEST ANALYSIS WITH NUMERICAL WEATHER PREDICTION (NWP) MODELS AND OTHER CONVENTIONAL TECHNIQUES, ESTIMATED FUTURE TRACK AND INTENSITY OF THE SYSTEM ARE GIVEN IN THE TABLE BELOW:

DATE/TIME(UTC)	POSITION (LAT. ^{0}N/LONG. ^{0}E)	SUSTAINED MAXIMUM SURFACE WIND SPEED (KNOTS)
24.05.2009/0300	18.0/88.5	30GUSTING TO 40
24.05.2009/0600	18.5/88.5	30 GUSTING TO 40
24.05.2009/1200	19.0/88.5	35 GUSTING TO 45
24.05.2009/1800	19.5/88.5	40 GUSTING TO 50
25.05.2009/0000	20.0/88.5	40 GUSTING TO 50
25.05.2009/1200	21.5/89.0	40 GUSTING TO 50
26.05.2009/0000	22.5/89.0	35 GUSTING TO 45
26.05.2009/1200	23.5/89.0	25 GUSTING TO 35

3. Tropical cyclone advisories

When a depression/deep depression reaches the cyclonic storm stage, or is shortly expected to reach that intensity, RSMC tropical cyclones, New Delhi will issue tropical cyclone advisories. Advisories will be issued at 00, 03, 06, 09, 12, 15, 18 and 21 UTC. Supplementary advisories may be issued as necessitated by circumstances, e.g., change in intensity or movement.

Tropical cyclone advisories contain information on the identification name, the present location, intensity and movement (present and past twelve hours) of the storm, and its forecast position, movement, intensity, maximum average surface wind, highest gust speed upto 72 hours and sea conditions (in qualitative terms). Important information obtained from radar observations and any relevant ship reports from the affected areas are also reported in the advisory. Like the Special Tropical weather outlook, it also contains the physical reasoning about the prognosis and diagnosis of the system. An example of Tropical Cyclone Advisory issued by RSMC, New Delhi with respect to cyclone ‘Aila’ is given below.

FROM : RSMC – TROPICAL CYCLONES, NEW DELHI

TO : STORM WARNING CENTRE, DHAKA (BANGLADESH)
STORM WARNING CENTRE, YANGAON (MYANMAR)

STORM WARNING CENTRE, BANGKOK (THAILAND)
STORM WARNING CENTRE, COLOMBO (SRILANKA)
STORM WARNING CENTRE, KARACHI (PAKISTAN)
METEOROLOGICAL OFFICE, MALE (MALDIVES)
OMAN METEOROLOGICAL DEPARTMENT, MUSCAT (THROUGH RTH JEDDAH)

TROPICAL CYCLONE ADVISORY

RSMC – TROPICAL CYCLONES, NEW DELHI

TROPCAL STORM **'AILA'** ADVISORY NO. ONE ISSUED AT 1400 UTC OF 24TH MAY 2009 BASED ON 1200 UTC CHARTS OF 24TH MAY 2009.

THE DEEP DEPRESSION OVER WESTCENTRAL & ADJOINING EASTCENTRAL AND NORTHWEST BAY OF BENGAL MOVED NORTHWARDS, INTENSIFIED INTO A CYCLONIC STORM "**AILA"** AND LAY CENTRED AT 1200 UTC OF TODAY, THE 24TH MAY 2009 NEAR LAT. 18.5^0 N AND LONG. 88.5^0 E, ABOUT 300 KM EAST-SOUTHEAST OF PARADIP, 350 KM SOUTH-SOUTHEAST OF SAGAR ISLAND AND 420 KM SOUTH-SOUTHWEST OF KHEPUPARA (BANGLADESH). THE SYSTEM IS LIKELY TO INTENSIFY FURTHER AND MOVE IN A NEAR NORTHERLY DIRECTION AND CROSS WEST BENGAL-BANGLADESH COAST NEAR LONGITUDE 88.5^0 E (ABOUT 50 KM EAST OF SAGAR ISLAND) AROUND 25TH MAY 2009 BETWEEN 0900 UTC AND 1200 UTC.

SATELLITE IMAGERY INDICATES BENDING FEATURES SYSTEM. CURRENT INTENSITY OF THE SYSTEM IS T2.5 ASSOCIATED BROKEN INTENSE TO VERY INTENSE CONVECTION OBSERVED OVER THE BAY OF BENGAL BETWEEN LAT. 14.0^0 N TO 20.0^0 N AND BETWEEN LONG. 83.0^0 E TO 90.0^0 E. THE LOWEST CLOUD TOP TEMPERATURE (CTT) DUE TO CONVECTION IS ABOUT -70^0C TO -80^0C TO THE WEST OF THE SYSTEM CENTRE.

SUSTAINED MAXIMUM SURFACE WIND SPEED IS ESTIMATED TO BE ABOUT 35 KNOTS GUSTING TO 45 KNOTS. STATE OF THE SEA IS HIGH AROUND THE SYSTEM CENTRE. ESTIMATED CENTRAL PRESSURE IS ABOUT 986 HPA.

VERTICAL WIND SHEAR OF HORIZONTAL WIND OVER THE REGION HAS DECREASED IN PAST 6 HOURS AND IT IS NOW AROUND 10 KNOTS. THE SYSTEM LIES VERY CLOSE TO THE UPPER TROPOSPHERIC RIDGE, WHICH ROUGHLY RUNS ALONG 20^0 N IN ASSOCIATION WITH THE ANTICYCLONIC CIRCULATION OVER MYANMAR AND ADJOINING NORTH BAY OF BENGAL LOCATED TO THE EAST-NORTHEAST OF THE SYSTEM CENTRE. THERE IS AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES ROUGHLY RUNNING ALONG 80^0 E TO THE NORTH OF 20^0 N. SEA SURFACE TEMPRATURES ARE WARMER OVER NORTH & CENTRAL BAY OF BENGAL. MAJORITY OF NWP MODELS ALSO SUGGEST INTENSIFICATION OF THE SYSTEM AND LANDFALL OVER WEST BENGAL AND ADJOINING BANGLADESH COAST NEAR LONGITUDE 88.5^0 E.

STORM SURGE OF ABOUT 2-3 METERS ABOVE ASTRONOMICAL TIDE IS LIKELY OVER COASTAL AREAS OF WEST BENGAL AND ADJOINING BANGLADESH COAST AT THE TIME OF LANDFALL.

CONSIDERING ALL THE ABOVE, THE SYSTEM IS LIKELY TO INTENSIFY FURTHER AND MOVE IN A NEAR NORTHERLY DIRECTION AND CROSS WEST BENGAL-BANGLADESH COAST NEAR LATITUDE 88.5^0 E (ABOUT 50 KM EAST OF SAGAR ISLAND) BETWEEN 0800 AND 1200 UTC OF 25TH MAY 2009.

BASED ON LATEST ANALYSIS WITH NUMERICAL WEATHER PREDICTION (NWP) MODELS AND OTHER CONVENTIONAL TECHNIQUES, ESTIMATED FUTURE TRACK AND INTENSITY OF THE SYSTEM ARE GIVEN IN THE TABLE BELOW:

DATE/TIME(UTC)	POSITION (LAT. ^{0}N/LONG. ^{0}E)	SUSTAINED MAXIMUM SURFACE WIND SPEED (KMPH)
24.05.2009/1200	18.5/88.5	65 GUSTING TO 75
24.05.2009/1800	19.5/88.5	75 GUSTING TO 85
25.05.2009/000	20.5/88.5	85 GUSTING TO 95
25.05.2009/0600	21.5/88.5	95 GUSTING TO 105
25.05.2009/1200	22.5/88.5(OVER LAND)	85 GUSTING TO 95
26.05.2009/0000	24.5/89.0(OVER LAND)	55 GUSTING TO 65

4. Warnings and advisories for aviation

In accordance with the International Civil Aviation Organization (ICAO) Annex 3 — *Meteorological Service for International Air Navigation*/ WMO Technical Regulations [C.3.1], tropical cyclone warnings, required for the international air navigation, are issued by designated meteorological watch offices (MWO) as SIGMET messages * , including an outlook, giving information up to 24 hours ahead in the interval of 6 hours concerning the expected positions and maximum surface wind of the centre of the tropical cyclone. Each MWO provides information for one or more specified Flight Information Regions (FIRs) or Upper Information Regions (UIRs). The boundaries of the FIRs/UIRs are defined in ICAO Air Navigation Plans (ANP) for the Asia (ASIA), Middle East (MID) and Pacific (PAC) Regions.

The designated Tropical Cyclone Advisory Centre (TCAC), New Delhi monitors the development of tropical cyclones in its area of responsibility, in accordance with the ASIA/PAC ANP and issues advisory information concerning the positions of the centre of the cyclone, its direction and speed of movement, central pressure and maximum surface wind near the centre. These advisories are disseminated to the MWOs in the TCAC, New Delhi area of responsibility and used in the preparation of the OUTLOOK appended to SIGMETs for tropical cyclones. In addition, the tropical cyclone advisories are disseminated to the other TCACs, whose areas of responsibility may be affected, to the World Area Forecast Centers (WAFC) London and Washington and international OPMET data banks, and centers operating the satellite distribution systems (SADIS and ISCS).

TC ADVISORY

DTG : 20090524/1200Z

TCAC: NEW DELHI

TC: AILA

NR: 01

PSN: N1830 E08830

MOV: N07KT

C: 986HPA

Max Wind: 35KT GUSTING TO 45KT

FCST PSN +6Hrs: 241800 N 1930 E08830

Max Wind + 12hrs: 40KT GUSTING TO 50KT

FCST PSN +12Hrs: 250000 N 2030 E08830

Max Wind + 12hrs: 45KT GUSTING TO 55KT

FCST PSN +18Hrs: 250600 N 2130 E 08830

Max Wind + 18hrs: 50KT GUSTING TO 60KT

FCST PSN +24Hrs: 251200 N 2230 E 08830 (OVER LAND)

Max Wind + 24hrs: 45KT GUSTING TO 55KT

NEXT MSG: 20090524/1800Z

Time of issue of bulletins

The names of bulletins, frequencies, base time and issue time depending upon the intensity/category of the cyclonic disturbances are summerised below in Table 1 and 2. When there is no cyclonic disturbance over the north Indian Ocean a Tropical Weather Outlook is issued daily at 0600 UTC based on 0300 UTC observation.

Table 1. Time of issue of bulletin when the system is depression/deep depression.

Bulletin	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)
Bulletin for Indian coast	0000	0300	0300	0600	0600	0900	-	-	1200	1500	-	-	1800	2100	-	-
Special Weather Outlook					0600	0900			1200	1500						

Table 2. Time of issue of bulletin when the system is cyclonic storm

Bulletin	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)	Base Time (UTC)	Issue Time (UTC)
Bulletin for Indian coast	0000	0300	0300	0600	0600	0900	0900	1200	1200	1500	1500	1800	1800	2100	2100	0000
*RSMC	0000	0300	0300	0600	0600	0900	0900	1200	1200	1500	1500	1800	1800	2100	2100	0000
**TCAC	0000	0300			0600	0900			1200	1500			1800	2100		

*****RSMC : Regional Specialised Meteorological Centre

******TCAC: Tropical Cyclone Advisory Centre

In addition to the above the Special Tropical Weather outlook may be issued at any time depending upon the formation/landfall of depression. For example, if the depression forms/crosses coast/dissipates over the sea at 0900 UTC, then the special tropical weather outlook is issued based on 0900 UTC observation.

****** Similarly the TCAC Bulletin may be issued at any time depending upon the formation of cyclonic storm/landfall of cyclone. For example if cyclonic storm forms/crosses the coast at 0900 UTC, then the bulletin may be issued based on 0900 UTC observations.