

**Terminology  
on  
Cyclonic disturbances over the North  
Indian Ocean**

**Cyclone Warning Division,  
IMD, New Delhi**

**Afternoon:** 1200 - 1600 HRS. IST

**Around Noon :** 1100 - 1300 HRS. IST

**Average wind speed:** Speed of the wind averaged over the previous 10 minutes (mean surface wind) as read from the anemogram or the 3 minutes mean determined with the non recording anemometer or estimated wind at sea by the mariners using the Beaufort scale.

**Bulletin:** Cyclone warning bulletin

**Calm ( Glassy) sea condition:** Wave height is zero corresponding to calm wind at the sea surface.

**Calm (Rippled) sea condition:** Wave height is 0- 0.1 metres corresponding to sea surface wind speed of 1 - 3 knots.

**CDO:** Central dense overcast.

**Central pressure of a tropical cyclone:** Surface pressure at the centre of the tropical cyclone as measured or estimated.

**Centre fix of the tropical cyclone:** The estimated location of the centre of a tropical cyclone. Fixation of the centre with the help of land based and other radars, satellite and conventional observations like surface and upper air observations, ships' reports, buoys report, commercial aircraft observations, etc.

**Centre of the tropical cyclone:** The centre of the cloud eye or, if not discernible, of the wind / pressure centre.

**CMV:** Cloud motion vector.

**Confidence in the centre position:** Degree of confidence in the centre position of a tropical cyclone expressed as the radius of the smallest circle within which the centre may be located by the analysis. "Position good" implies a radius of 30 nautical miles (55 kilometers) or less, "Position fair", a radius of 30 to 60 nautical miles (55 to 110 km) and "Position poor", a radius of greater than 60 nautical miles (110 km).

**Convergence:** Convergence is the process whereby air streams come together into a much smaller central area, either by opposing flow directions or by some faster elements catching up to those ahead. In the atmosphere, when winds converge over a relatively small area, the push of the air-molecule crowd forces those in the centre to form an upward air current or updraft.

**Coriolis force:** Once air has been set in motion by the pressure gradient force, it undergoes an apparent deflection from its path, as seen by an observer on the

earth. This apparent deflection is called the "Coriolis force" and is a result of the earth's rotation.

**CTT:** Cloud top temperature.

**Cyclogenesis:** It is the development or strengthening of cyclonic circulation in the atmosphere (a low pressure system).Cyclogenesis is an umbrella term for several different processes, all of which result in the development of cyclonic disturbances (Depression and above).

**Cyclone Alert\*:** A priority message for the Government officials containing tropical cyclone information and advisories issued generally 48 hours before the commencement of adverse weather.

**Cyclone warning bulletin:** A priority message for exchange of tropical cyclone information and advisories.

**Cyclone warning:** A priority message containing tropical cyclone warning and advisories issued generally 24 hours in advance of the commencement of adverse weather.

**Cyclone:** Tropical cyclone

**Cyclonic disturbance:** A non frontal synoptic scale low pressure system originating over tropical waters with organized convection and definite cyclonic wind circulation. It is called as a depression if the associated sustained maximum wind speed at surface level is 17-27 knots. It is called as a deep depression if the sustained maximum wind speed is 28-33 knots.

**Cyclonic storm:** A cyclonic disturbance in which the maximum average surface wind speed is in the range of 34 to 47 knots (62 to 88 kmph).

**Depression:** A cyclonic disturbance in which the maximum sustained surface wind speed is between 17 and 33 knots (31 and 61 kmph). If the maximum sustained wind speed lies in the range 28 knots (50 kmph) to 33 knots (61 kmph) the system may be called a "Deep Depression". \*

**Direction of movement of the tropical cyclone:** The direction towards which the centre of the tropical cyclone is moving.

**Divergence:** Divergence is the opposite situation to convergence, the moving away of air from a common area. In the upper troposphere, an elevated zone of divergence can establish an updraft region below it. Upper-level divergence that can induce sustained updrafts from the surface is one sign that severe-weather forecasters look for as an indicator of cyclone formation or severe thunderstorm potential.

**Early Hours:** 0000 - 0400 HRS. IST

**Early Morning:** 0400 - 0600 HRS. IST

**ECP:** Estimated central pressure of the cyclone.

**ESCAP:** Economic Social Commission for Asia and the Pacific.

**Evening:** 1600 - 2000 HRS. IST

**Exceptionally Heavy Rainfall:** When the amount is a value near about the highest recorded rainfall at or near the station for the month or season. However, this term will be used only when the actual rainfall amount exceeds 12 cm.

**Extremely Heavy Rainfall:** 24 hours cumulative rainfall at a station is greater than **204.5 mm** as recorded at 0830 hrs IST.

**Extremely severe cyclonic storm:** A cyclonic disturbance in which the maximum average surface wind speed is 90 knots (167 kmph) to 119 knot (221kmph).

**Eye of the tropical cyclone:** The relatively clear and calm area inside the circular wall of convective clouds, the geometric centre of which is the centre of the tropical cyclone.

**Fairly Widespread rainfall:** (51 – 75)% of area gets rainfall.

**Forenoon:** 0800 - 1200 HRS. IST

**Gale force wind:** Average surface wind speed of 34 knots or more.

**GMDSS:** Global Maritime Distress and Safety System.

**GMT:** Greenwich Mean Time.

**Gust:** Instantaneous peak value of surface wind speed recorded or expected.

**Heavy Rainfall :** 24 hours cumulative rainfall at a station is **64.5-115.5 mm** as recorded at 0830 hrs IST.

**High sea condition:** Wave height is 6.0 - 9.0 metres corresponding to sea surface wind speed of 34 - 40 knots.

**HPA:** Hecta Pascal. It is the unit of atmospheric pressure.

**INSAT:** Indian National Satellite.

**IR imagery:** Infrared Channel imagery.

**Isolated rainfall :** Less than <25% of area gets rainfall.

**IST:** Indian Standard Time

**ITCZ** : The Intertropical Convergence Zone (ITCZ), is a belt of low pressure girdling Earth near the equator. It is formed by the vertical ascent of warm, moist air from the latitudes north and south of the equator.

**Knots**: Nautical miles per hour. 1 Knots = 1.86 KM per hour.

**Light Rain rainfall**: 24 hours cumulative rainfall at a station is **2.5–15.5 mm** as recorded at 0830 hrs IST.

**Low or low pressure area**: An area enclosed by a closed isobar with minimum pressure inside when mean surface wind is less than 17 knots (31 kmph).

**Maximum sustained wind**: Maximum value of the average wind speed at the surface.

**Maximum sustained surface wind speed**: Highest 3 minutes surface wind occurring within the circulation of the system. These "surface" winds are those observed (or, more often, estimated) to occur at the standard meteorological height of 10 m (33 ft) in an unobstructed exposure (i.e., not blocked by buildings or trees).

**Mean wind speed**: Average wind speed.

**Moderate Rain rainfall**: 24 hours cumulative rainfall at a station is **15.6-64.4 mm** as recorded at 0830 hrs IST

**Moderate sea condition**: Wave height is 1.25 - 2.5 metres corresponding to sea surface wind speed of 17 - 21 knots.

**Morning**: 0400 - 0800 HRS. IST

**Name of the Tropical Cyclone**: Once wind speed in a cyclonic disturbance attains a 34 kt threshold value it will be given an identification name by RSMC tropical cyclones New Delhi from the consolidated name list.

**Night**: 2000 - 2400 HRS. IST

**No Rain**: The amount of rainfall 0.0 mm.

**Panel members or member countries or countries**: Countries constituting the WMO/ESCAP Panel on Tropical Cyclones viz: Bangladesh, India, Maldives, Myanmar, Oman (Sultanate of), Pakistan, Sri Lanka and Thailand.

**Phenomenal sea condition**: Wave height is over 14.0 metres corresponding to sea surface wind speed of 64 or above knots.

**Post Landfall Outlook**: This bulletin is issued 12 hours before cyclone landfall and contains more specific forecasts about place and time of landfall.

**Pre-Cyclone Watch:** This bulletin contains early warning about likely development of a cyclonic storm and an indication of the coastal belt likely to experience adverse weather. It is issued 72 hrs in advance of the commencement of adverse weather.

**Pressure gradient :**The pressure gradient is a physical quantity that describes in which direction and at what rate the pressure changes the most rapidly around a particular location. The pressure gradient is a dimensional quantity expressed in units of pressure per unit length.

**Rainfall at a one or two places :** Less than <25% of total raingauge stations get rainfall.

**Rainfall at a few places :** (26 –50)% of total raingauge stations get rainfall.

**Rainfall at many places:** (51 – 75)% of total raingauge stations get rainfall.

**Rainfall at most places:** (76 – 100)% of total raingauge stations get rainfall.

**Rough sea condition:** Wave height is 2.5 - 4.0 metres corresponding to sea surface wind speed of 22 - 27 knots.

**RSMC:** Regional Specialized Meteorological Center.

**Scattered :** (26 –50)% of area gets rainfall.

**Severe cyclonic storm:** A cyclonic disturbance in which the maximum average surface wind speed is in the range of 48 to 63 knots (89 to 117 kmph).

**Slight sea condition:** Wave height is 0.5 - 1.25 metres corresponding to sea surface wind speed of 11 - 16 knots.

**Smooth (waveless) sea condition:** Wave height is 0.1-0.5 metres corresponding to sea surface wind speed of 04-10 knots.

**Speed of movement of the tropical cyclone:** Speed of movement of the centre of the tropical cyclone.

**Squally wind:** When sudden increases of wind speed occur in squalls with the increased speed reaching a minimum of 22 knots (40 kmph) and persist for at least one minute.

**SST:** Sea surface temperature.

**State of sea or sea condition:** The state of sea is described qualitatively as calm, smooth, slight, moderate, rough, very rough, high, very high and phenomenal sea. However these qualitative terms correspond to a range of height of waves based on the surface wind speed.

**Storm season:** The periods April to May and October to December during which most of the cyclonic storms occur in the Bay of Bengal and Arabian Sea.

**Storm surge:** The difference between the actual water level under the influence of a meteorological disturbance (storm tide) and the level, which would have been reached in the absence of the meteorological disturbance (i.e. astronomical tide). (Storm surge results mainly from the shoreward movement of water under the action of wind stress. A minor contribution is also made by the hydrostatic rise of water resulting from the lowered barometric pressure.)

**Storm tide:** The actual water level as influenced by a weather disturbance. The storm tide consists of the normal astronomical tide and the storm surge.

**Super cyclonic storm:** A cyclonic disturbance in which maximum wind speed is 120 knots and above (222 kmph and above).

**T Number:** T stands for tropical cyclones. It indicates the intensity of cyclonic disturbance bases on Dvorak's technique. It varies from 1.0 to 8.0 at an interval of 0.5.

**TCAC:** Tropical Cyclone Advisory Centre.

**Tropical cyclone advisory:** A priority message for exchanging information, internationally, on tropical cyclones in the Bay of Bengal and the Arabian Sea.

**Tropical cyclone:** Generic term for a non-frontal synoptic scale cyclone originating over tropical or subtropical waters with organized convection and definite cyclonic surface wind circulation.

**Tropical depression:** Depression.

**Tropical storm:** Tropical cyclone.

**Tropical Weather Outlook:** A priority message for exchange between the Panel countries of synoptic and satellite inferences for the Bay of Bengal and the Arabian Sea region.

**UTC:** Universal Time Co-ordinate.

**Vertical Wind Shear:** Difference of horizontal component of wind between 200 hPa and 850 hPa level.

**Vertical Wind Shear Tendency:** 24 hours change in vertical wind shear.

**Very Heavy Rainfall:** 24 hours cumulative rainfall at a station is **115.6-204.4 mm** as recorded at 0830 hrs IST.

**Very High sea condition:** Wave height is 9.0 - 14.0 metres corresponding to sea surface wind speed of 41 - 63 knots.

**Very light Rainfall:** 24 hours cumulative rainfall at a station is **Trace –2.4 mm** as recorded at 0830 hrs IST.

**Very Rough sea conditon:** Wave height is 4.0 - 6.0 metres corresponding to sea surface wind speed of 28 - 33 knots.

**Very severe cyclonic storm:** A cyclonic disturbance in which the maximum average surface wind speed is 64 knots (118 kmph) to 89 knot (166kmph).

**VIS imagery:** Visible Channel imagery.

**Visual storm signals:** Visual signals displayed at coastal ports to warn ships of squally winds, gales and tropical cyclones.

**Vorticity:** Vorticity is a mathematical concept used in fluid dynamics. It can be related to the amount of "circulation" or "rotation" (or more strictly, the local angular rate of rotation) in a fluid. The average vorticity  $\zeta_{av}$  in a small region of fluid flow is equal to the circulation  $\Gamma$  around the boundary of the small region, divided by the area of the small region.

**Weather warning:** Meteorological message issued to provide appropriate warnings of hazardous weather conditions.

**Wide spread rainfall:** (76 – 100)% of area gets rainfall.

**WMO:** World Meteorological Organization

**WV imagery:** Water vapour Channel imagery.

**Zone of disturbed weather:** A zone in which the pressure is low relative to the surrounding region and there is convective cloud masses which are not organized.