



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY**

DEMS-RSMC SPECIAL TROPICAL CYCLONES NEW DELHI DATED 13.06.2023

FROM: RSMC –TROPICAL CYCLONES, NEW DELHI

**TO: STORM WARNING CENTRE, NAYPYI TAW (MYANMAR)
STORM WARNING CENTRE, BANGKOK (THAILAND)
STORM WARNING CENTRE, COLOMBO (SRILANKA)
STORM WARNING CENTRE, DHAKA (BANGLADESH)
STORM WARNING CENTRE, KARACHI (PAKISTAN)
METEOROLOGICAL OFFICE, MALE (MALDIVES)
OMAN METEOROLOGICAL DEPARTMENT, MUSCAT (THROUGH RTH JEDDAH)
YEMEN METEOROLOGICAL SERVICES, REPUBLIC OF YEMEN (THROUGH RTH JEDDAH)
NATIONAL CENTRE FOR METEOROLOGY, UAE (THROUGH RTH JEDDAH)
PRESIDENCY OF METEOROLOGY AND ENVIRONMENT, SAUDI ARABIA (THROUGH RTH JEDDAH)
IRAN METEOROLOGICAL ORGANISATION, (THROUGH RTH JEDDAH)
QATAR METEOROLOGICAL DEPARTMENT (THROUGH RTH JEDDAH)**

TROPICAL CYCLONE ADVISORY NO. 62 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0600 UTC OF 14.06.2023 BASED ON 0300 UTC OF 14.06.2023

SUB: VERY SEVERE CYCLONIC STORM “BIPARJOY” (PRONOUNCED AS “BIPORJOY”) OVER NORTHEAST ARABIAN SEA (CYCLONE WARNING FOR SAURASHTRA & KUTCH COASTS (RED MESSAGE))

THE VERY SEVERE CYCLONIC STORM “BIPARJOY” (PRONOUNCED AS “BIPORJOY”) OVER NORTHEAST ARABIAN SEA MOVED NEARLY NORTHWARDS WITH A SPEED OF 3 KMPH DURING PAST 6-HOURS AND LAY CENTERED AT 0300 UTC OF TODAY, THE 14TH JUNE, 2023 OVER THE SAME REGION NEAR LATITUDE 21.9°N AND LONGITUDE 66.3°E, ABOUT 280 KM WEST-SOUTHWEST OF JAKHAU PORT (GUJARAT), 290 KM WEST-SOUTHWEST OF DEVBHUMI DWARKA (42731), 300 KM WEST-SOUTHWEST OF NALIYA (42631), 350 KM WEST-NORTHWEST OF PORBANDAR (42830), AND 340 KM SOUTH-SOUTHWEST OF KARACHI (PAKISTAN, 41780).

IT IS VERY LIKELY TO MOVE NEARLY NORTHEASTWARDS AND CROSS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS BETWEEN MANDVI (GUJARAT, 42929) AND KARACHI (PAKISTAN, 41780) NEAR JAKHAU PORT (GUJARAT) BY 1200 UTC OF 15TH JUNE AS A VERY SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 125-135 KMPH GUSTING TO 150 KMPH.

Forecast track and intensity are given below:

| Date/Time(UTC) | Position (Lat. °N/ long. °E) | Maximum sustained surface wind speed (Kmph) | Category of cyclonic disturbance |
|-----------------------|---|--|---|
| 14.06.23/0300 | 21.9/66.3 | 145-155 Gusting To 170 | Very Severe Cyclonic Storm |
| 14.06.23/0600 | 22.1/66.5 | 145-155 Gusting To 170 | Very Severe Cyclonic Storm |
| 14.06.23/1200 | 22.4/66.8 | 140-150 Gusting To 165 | Very Severe Cyclonic Storm |
| 14.06.23/1800 | 22.7/67.2 | 135-145 Gusting To 160 | Very Severe Cyclonic Storm |
| 15.06.23/0000 | 23.0/67.7 | 130-140 Gusting To 155 | Very Severe Cyclonic Storm |
| 15.06.23/1200 | 23.5/68.5 | 125-135 Gusting To 150 | Very Severe Cyclonic Storm |
| 16.06.23/0000 | 24.2/69.7 | 90-100 Gusting To 110 | Severe Cyclonic Storm |
| 16.06.23/1200 | 24.8/71.1 | 50-60 Gusting To 70 | Deep Depression |
| 17.06.23/0000 | 25.1/72.4 | 25-35 Gusting To 45 | Well Marked Low pressure Area |

AS PER INSAT 3D IMAGERY, INTENSITY OF THE SYSTEM IS T4.5. CLOUDS ARE ORGANISED IN CENTRAL DENSE OVERCAST PATTERN. ASSOCIATED BROKEN LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY MAINLY OVER CENTRAL AND ADJOINING NORTH ARABIAN SEA BETWEEN LATITUDE 17.0°N & 23.5°N AND LONGITUDE 60.0°E & 68.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. MAJOR CONVECTION AREA IS SEEN IN SOUTHWEST SECTOR. CONVECTION IS DECREASING IN THE NORTHERN SECTOR. EYE IS GETTING OPENED AND CLOSED AND IS MOVING NORTHEASTWARDS. 24 HOUR ANIMATION INDICATES THAT DISTANCE BETWEEN CENTRE OF SYSTEM AND INTENSE CLOUD MASS HAS INCREASED. THIS IS INDICATING WEAKENING OF THE SYSTEM IN PAST 24 HOURS. CLOUDS ARE ORIENTED IN SOUTHWEST TO NORTHEAST DIRECTION. MULTISAT WINDS INDICATE STRONGER WINDS IN THE NORTHEAST AND SOUTHEAST SECTOR.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED (MSW) IS 80 KNOTS GUSTING TO 90 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 966 HPA. SEA CONDITION IS LIKELY TO BE PHENOMENAL OVER NORTHEAST ARABIAN SEA AND ROUGH TO VERY ROUGH OVER ADJOINING EASTCENTRAL ARABIAN SEA.

OKHA (42730) REPORTED DEPARTURE FROM NORMAL IN MEAN SEA LEVEL PRESSURE OF -4.2 HPA AND NALIYA (42631) & DWARKA (42731) REPORTED A DEPARTURE OF -4.6 HPA.

REMARKS:

SEA SURFACE TEMPERATURE IS AROUND 29-30°C OVER NORTHEAST ARABIAN SEA. OCEAN HEAT CONTENT IS 60-70KJ/CM² AND IS EXPECTED TO DECREASE GRADUALLY ALONG THE FORECAST TRACK BECOMING 30-40 KJ/CM² OFF SAURASHTRA & KUTCH COASTS. TOTAL PRECIPITABLE WATER IMAGERY INDICATES WARM MOIST AIR INCURSION INTO THE CORE OF SYSTEM. THE GRADIENT WIND ANALYSIS INDICATES THAT DURING PAST 24 HOURS, RADIUS OF GRADIENT WIND HAS INCREASED AND TEMPERATURE ANOMALY AT 300 HPA HAS DECREASED. ALL THESE FEATURES INDICATE THAT THE SYSTEM HAS WEAKENED IN PAST 24 HOURS.

THE LOW LEVEL VORTICITY IS THE SAME DURING PAST TWELVE HOURS AND IS AROUND 300X10⁻⁶S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. LOW LEVEL CONVERGENCE IS THE SAME AND IS ABOUT 50X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE AND UPPER LEVEL DIVERGENCE IS THE SAME AND IS ABOUT 40X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF SYSTEM CENTRE. VERTICAL WIND SHEAR HAS SLIGHTLY DECREASED AND IS AROUND (20-25 KNOTS) OVER THE SYSTEM AREA AND IS DECREASING TO 10-15 KNOTS ALONG THE FORECAST TRACK. DEEP LAYER MEAN WIND INDICATE THAT THE SYSTEM IS BEING SHEARED NORTHWARDS SLOWLY. THE RIDGE RUNS ALONG 22°N. THE DEEP LAYER MEAN WINDS, INDICATE A DEEP TROUGH ALONG 65.0E TO THE WEST OF SYSTEM CENTRE. THIS TROUGH, WOULD FURTHER TEND TO FURTHER PUSH THE CYCLONE NORTHEASTWARDS AND ALSO WOULD LEAD TO INCREASE IN TRANSLATIONAL SPEED OF THE SYSTEM.

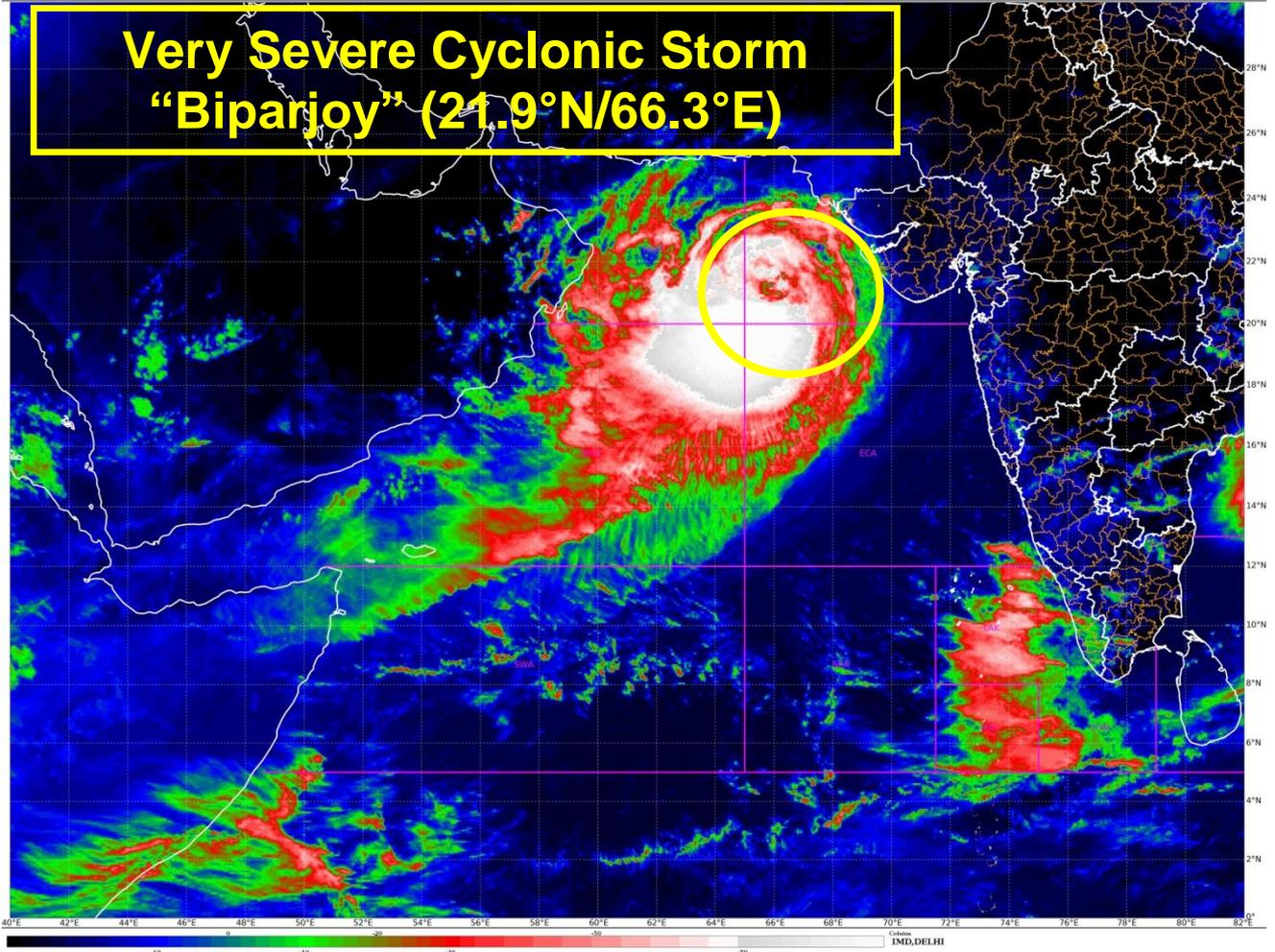
AS THE SYSTEM WILL APPROACH COAST, IT IS LIKELY TO EXPERIENCE LOWER OCEAN THERMAL ENERGY (40-50 KJ/CM²) AND DECREASE IN MIDDLE LEVEL HUMIDITY DUE TO DRY COLD AIR INTRUSION. HOWEVER, AFTER LANDFALL, THE SYSTEM IS LIKELY TO WEAKEN GRADUALLY AS THE WIND SHEAR WILL BE LOW TO MODERATE AND THERE WILL BE SUFFICIENT MOISTURE ALONG THE FORECAST TRACK IN THE MIDDLE LEVELS.

CONSIDERING ALL THE ABOVE, TC BIPARJOY IS VERY LIKELY TO MOVE NEARLY NORTHEASTWARDS AND CROSS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS BETWEEN MANDVI (GUJARAT, 42929) AND KARACHI (PAKISTAN, 41780) NEAR JAKHAU PORT (GUJARAT) BY 1200 UTC OF 15TH JUNE AS A VERY SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 125-135 KMPH GUSTING TO 150 KMPH.

**M. SHARMA
SCIENTIST D
RSMC NEW DELHI**

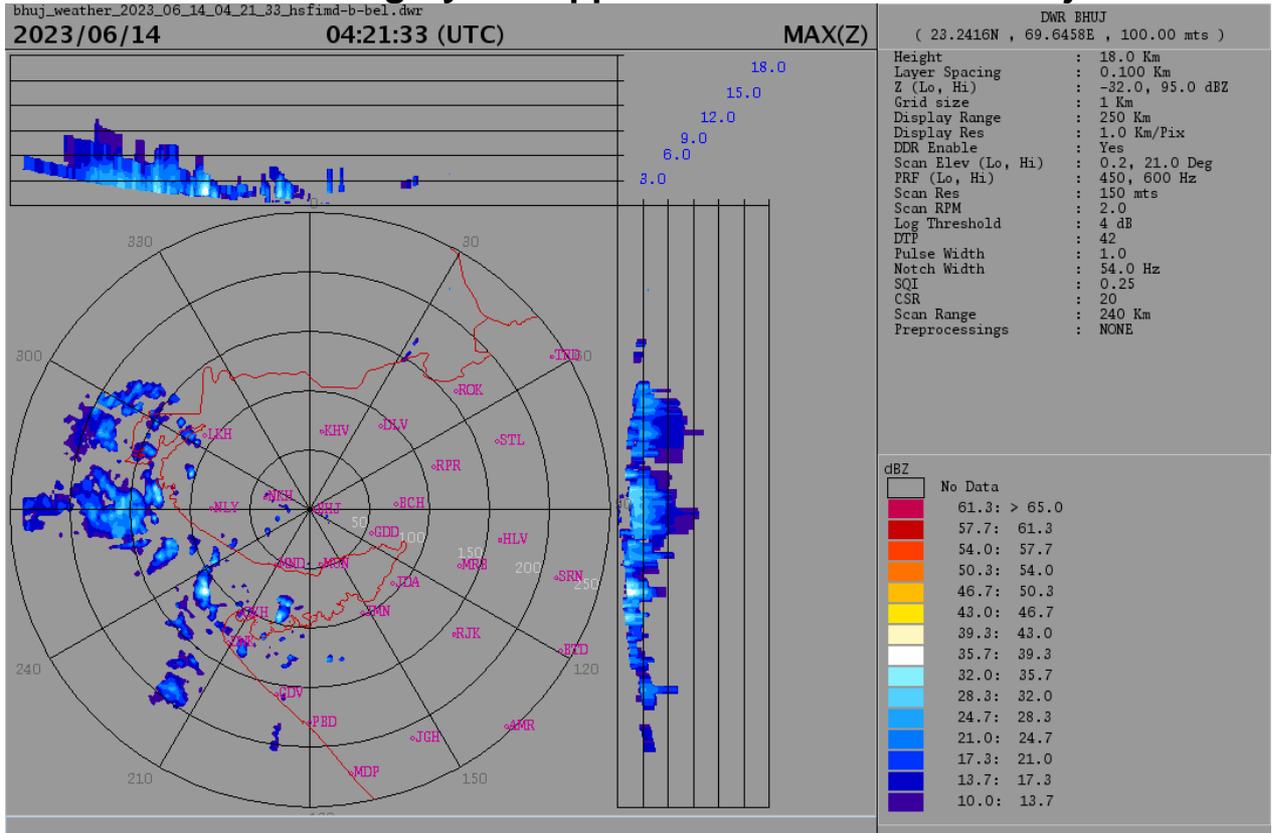


Very Severe Cyclonic Storm "Biparjoy" (21.9°N/66.3°E)



Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION):NIL: 0%, LOW: 1-33%, , MODERATE: 34-66% AND HIGH: 67-100%
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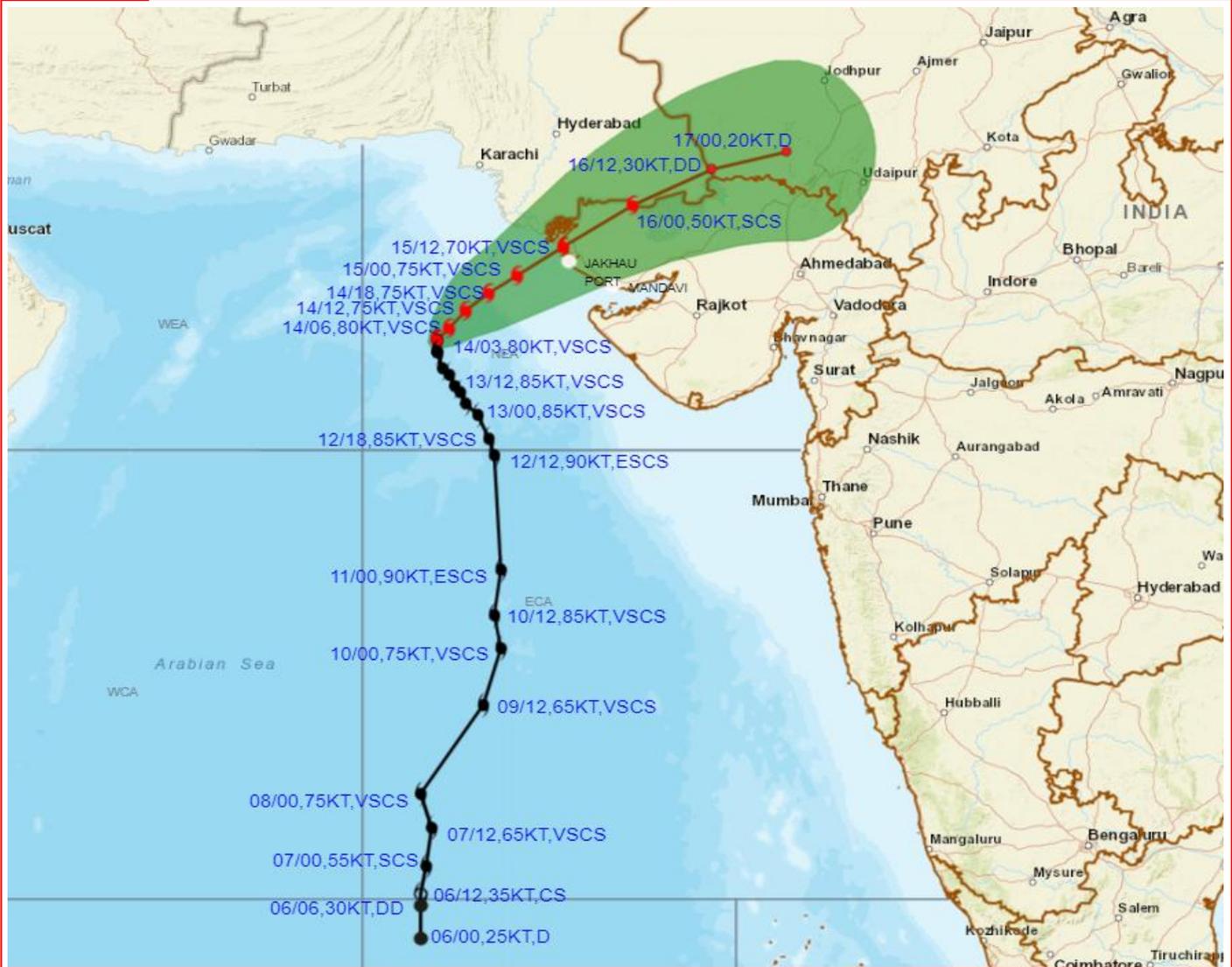
Radar Imagery of Doppler Weather Radar at Bhuj



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OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF VERY SEVERE CYCLONIC STORM "BIPARJOY" OVER NORTHEAST ARABIAN SEA BASED ON 0300 UTC (0830 IST) OF 14TH JUNE 2023.



DATE/TIME IN UTC
 IST=UTC + 0530
 L: LOW PRESSURE AREA
 WML: WELL MARKED LOW PRESSURE AREA
 D: DEPRESSION (17-27 KT)
 DD: DEEP DEPRESSION (28-33 KT)
 CS: CYCLONIC STORM (34-47 KT)
 SCS: SEVERE CYCLONIC STORM (48-63KT)
 VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)
 ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)
 SuCS: SUPER CYCLONIC STORM (≥ 120 KT)

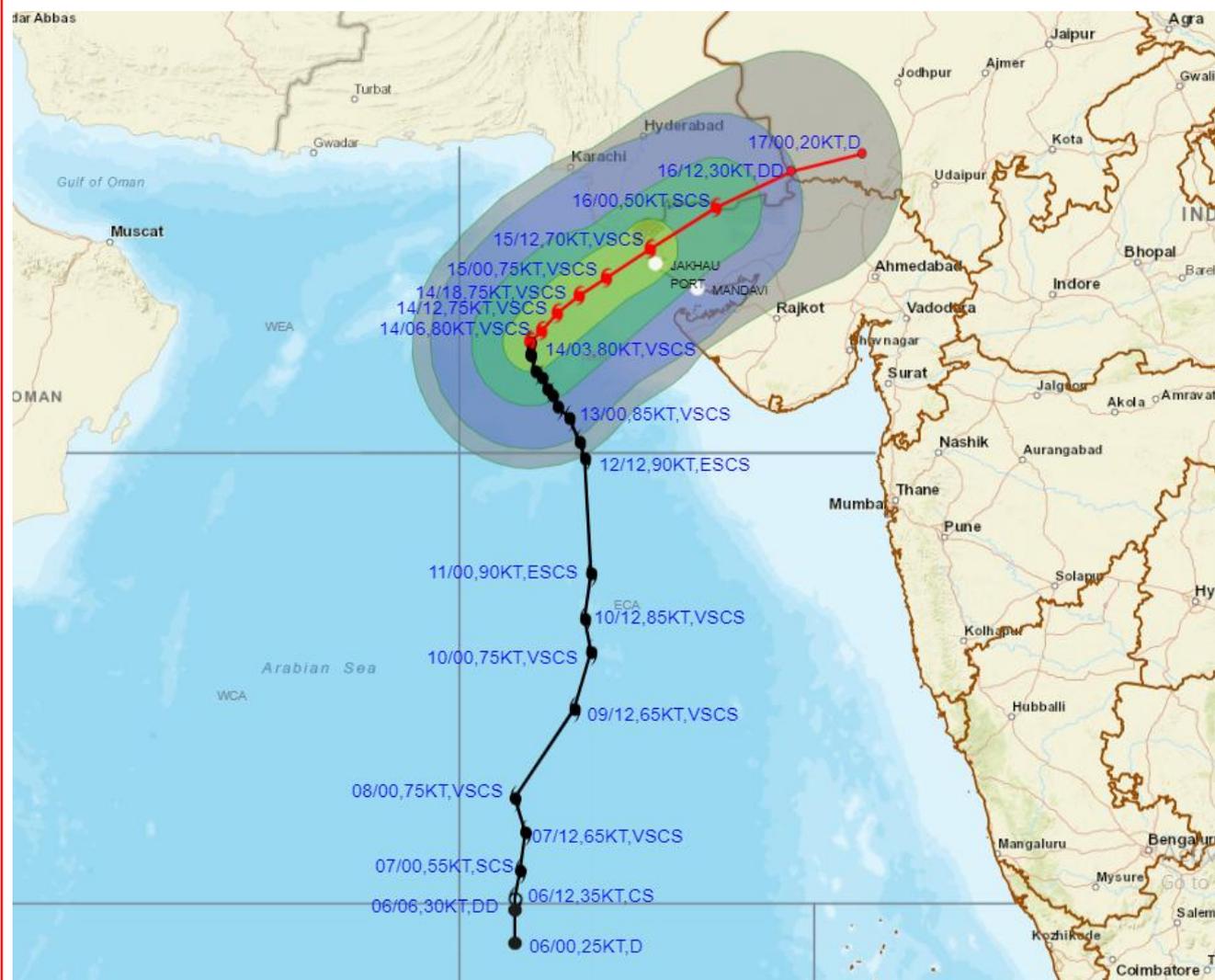
- LESS THAN 34 KT
- 34-47 KT
- ≥ 48 KT
- OBSERVED TRACK
- FORECAST TRACK
- CONE OF UNCERTAINTY

| Forecast | DISTANCE(KM) AND DIRECTION FROM STATIONS | | | | |
|---------------|--|----------|-------------|----------|-----------------|
| Date and Time | PORBANDAR | DWARKA | JAKHAU PORT | NALIYA | KARACHI AIRPORT |
| 15.06.23/0000 | 260, NW | 160, WNW | 100, WSW | 130, WSW | 220, SSE |
| 16.06.23/0000 | 290, N | 220, NNE | 160, NE | 140, NE | 280, ESE |
| 17.06.23/0000 | 470, NE | 450, NE | 440, ENE | 420, ENE | 530, E |

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OBSERVED AND FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF VERY SEVERE CYCLONIC STORM "BIPARJOY" OVER NORTHEAST ARABIAN SEA BASED ON 0300 UTC (0830 IST) OF 14TH JUNE 2023.



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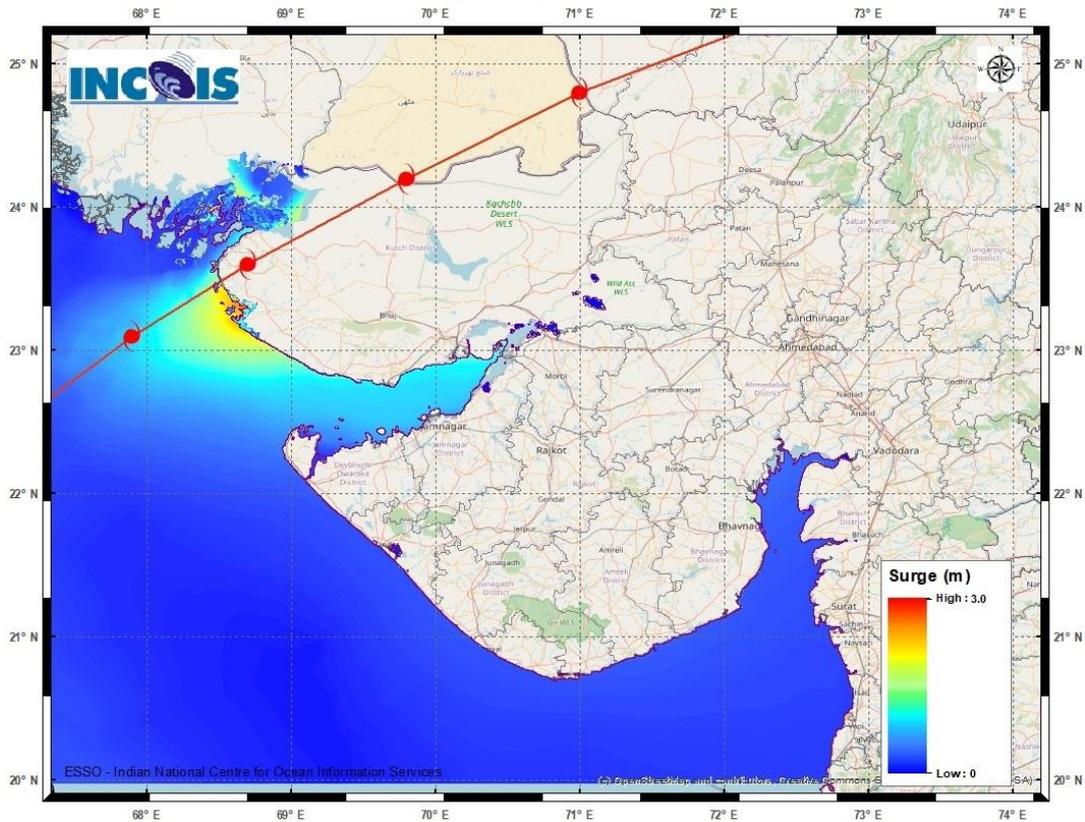
● LESS THAN 34 KT
 ○ 34-47 KT
 ⊙ ≥ 48 KT
 — OBSERVED TRACK
 — FORECAST TRACK
 ▲ CONE OF UNCERTAINTY
 AREA OF MAXIMUM SUSTAINED WIND SPEED:
 ■ 28-33 KT (52-61 KMPH)
 ■ 34-49 KT (62-91 KMPH)
 ■ 50-63 KT (92-117 KMPH)
 ■ ≥ 64 KT (≥118 KMPH)

IMPACT OVER THE SEA

| MSW (knot/kmph) | Impact | Action |
|-----------------|------------------------|--|
| 28-33 (52-61) | Very rough seas | Total suspension of fishing operations |
| 34-49 (62-91) | High to very high seas | Total suspension of fishing operations |
| 50-63 (92-117) | Very high seas | Total suspension of fishing operations |
| ≥ 64 (≥118) | Phenomenal | Total suspension of fishing operations |

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Storm Surge Warning Map based on Forecast Track



Astronomical Tide on 15th June 2023

| Station | Time (IST) | Height (m) |
|-------------------------|------------|------------|
| Porbandar | 09:37 | 2.61 |
| Navlakhi | 13:38 | 7.54 |
| OKHA | 11:36 | 3.74 |
| DEENDAYAL PORT (KANDLA) | 13:02 | 6.79 |

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