

TC 22-77 was the most devastating storm in the Indian Ocean since 1971. It developed 115 kt (59 m/sec) winds and inundated South-eastern India with heavy rains and high seas. TC 22-77 occurred during the autumn monsoon transition period, when cyclone development is most favorable, and became the only storm to attain typhoon strength this season in the Bay of Bengal.

Meteorological satellite first located TC 22-77 during the morning of the 14th of November as a weak disturbance, approximately 150 nm (278 km) southwest of the Nicobar Islands. Five hours later new satellite data revealed better defined banding which indicated increased organization. This prompted the issuance of a formation alert the same day at 1310Z. Heading due west along the southern periphery of the mid-tropospheric subtropical ridge, the disturbance quickly accelerated to 13 kt (24 km/hr), while steadily intensifying. Later satellite and synoptic data supported a well developed cyclone of about 40 kt (21 m/sec). At 0800Z on the 15th the first warning was issued. A post analysis showed that TC 22-77 was rapidly developing during this period.

Ever since TC 22-77 was first detected, an upper tropospheric trough was forming over northern India. By the 15th this trough was firmly established and extended over central India, creating a break in the subtropical ridge. As the cyclone neared India, it began moving northwestward toward the trough induced break. This break also weakened the mid-tropospheric anticyclone and consequently reduced the storm's steering flow, and as a result, TC 22-77 steadily slowed to a 4 kt

(7 km/hr) movement. It was now intensifying at the rate of 30 kt (15 m/sec) per 24 hours, primarily in response to the divergent southwesterly flow produced by the upper level trough above the approaching cyclone. TC 22-77 attained typhoon strength by the afternoon of the 15th, and by 0629Z on the 16th satellite data revealed an eye.

For the next 2 days, TC 22-77 tracked north-northwestward at an average speed of 9 kt (17 km/hr) while continuing to strengthen. By the 18th, it began to decelerate and was intensifying 10 kt (5 m/sec) each day. Successive satellite pictures showed tighter banding features while the eye became more distinct (Fig. 4-36). Approximately 75 nm (140 km) from the Indian coast, TC 22-77 reached a maximum intensity of 115 kt (59 m/sec). Just prior to landfall, TC 22-77 accelerated to 9 kt (17 km/hr) toward the north-northwest. At 1100Z on the 19th, the storm struck with sustained winds of 105 kt (54 m/sec) and an 18 ft (5.5 m) tidal wave along the coast of Andhra Pradesh about 40 nm (75 km) south of Vijayawada (WMO 43181). TC 22-77 then turned northward over flat farm lands while weakening slowly, and the final warning was issued at 2000Z on the 19th.

The combined winds, seas and rains generated by TC 22-77 killed nearly 10,000 people, left hundreds of thousands homeless and devastated lands that produce roughly 40 per cent of India's food grains. The tidal wave was probably the single most destructive force accompanying the storm. It penetrated 10 nm (19 km) inland and washed away more than 21 villages.

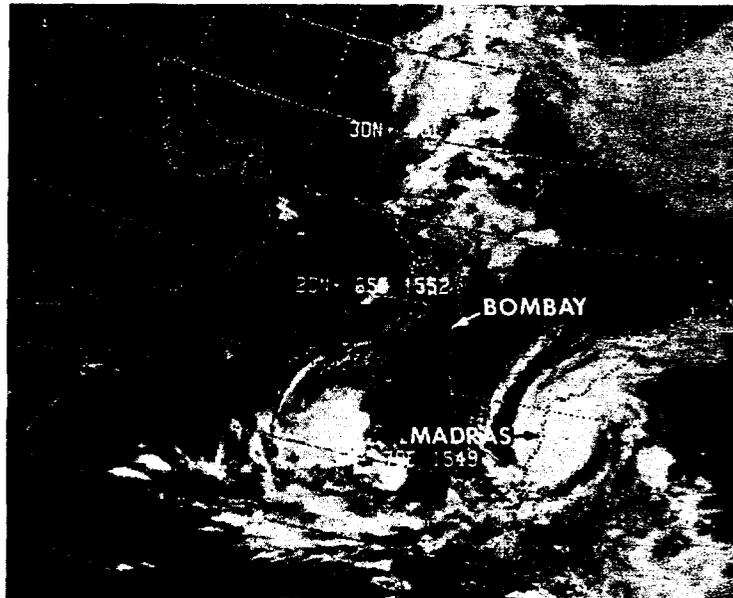


FIGURE 4-36. Infrared photograph of TC 22-77 at maximum intensity of 115 kt (59 m/sec), 18 November 1977, 1618Z. In the Arabian Sea TC 21-77 with 65 kt (33 m/sec) winds completing a loop before striking southwestern India. (NOAA-5 imagery from FLEWEAFAC Suitland, MD)