

## **Tropical Cyclone Penny 06/11/1974 – 16/11/1974**

### (i) General

As the entire life of cyclone “Penny” was spent in the Indian Ocean, few indications of its characteristics apart from those provided by satellite photographs are available. Maximum winds were estimated to have reached 126 km/h at about 101330 GMT.

### (ii) Development

This cyclone developed in an area north of Cocos Island, apparently close to the inter-tropic convergence zone (ITCZ) although there is sufficient data to confirm this. An area of enhanced activity was first detected at 051330 GMT by satellite analysis. By 070130 GMT intensification was evident and the system was classified as a low with central pressure approximately 1003 mb. It appeared to remain at similar strength until 090200 GMT when further development commenced.

A number of aircraft reports were obtained in the vicinity of the cyclone during its developing stage (see table 3.1). There was a large variation in the wind strength at levels above 3000 ft between 8<sup>th</sup> and 10<sup>th</sup> November, ranging from the satellite analysis, that development seemed to be arrested on 8<sup>th</sup> November, due to increased shear above 500 mb.

Maximum strength was apparently reached on 10<sup>th</sup> November when the central pressure was estimated to be 981 mb. The cyclone probably remained near this intensity until 12<sup>th</sup> November. “Penny weakened slowly to approximately 988 mb by 13<sup>th</sup> November. Furthermore rapid weakening occurred by 14<sup>th</sup> November, with the central pressure then being estimated at 999mb. Twelve hours later, very little high cloud appeared to remain over disturbance. By 16<sup>th</sup> November no circulation could be detected in the general area.

### (iii) Features of the Track (fig. 3.1)

The lifetime of cyclone “Penny” was approximately eight days, and the distance it travelled was about 2300 km. the track showed no unusual features but after the cyclone decayed on 12<sup>th</sup>-13<sup>th</sup> November the low level circulation was obviously influenced by the trade winds and moved towards the west northwest.

Between 12<sup>th</sup> and 14<sup>th</sup> November a major upper air trough moved across the eastern Indian Ocean. There is some evidence that the influence of this trough extended to low latitudes. Winds at 500 mb at Cocos Island backed from west northwest at 32 km/h at 142200 GMT. The Passage of this upper trough coincided with a change in the cyclone’s direction of travel and the latter part of its decay.

### (iv) Rainfall

Due to the location of this cyclone, very little rainfall data is available. The heaviest fall at Cocos Island was in the 24 hours prior to 090100, when the cyclone was 450 km distant. Between 8<sup>th</sup> and 11<sup>th</sup> November, the Islands had frequent showers. Showers were also reported from the “Daphne” AND THE “Unique Alliance” which were the closet vessels to the centre (see table 3.2).

(v) Winds

Maximum winds reported were from the ships which appear in table 3.2. The maximum wind speed generated by the cyclone was estimated by satellite analysis to be 126 km/h at 101330 GMT.

(vi) Sea and Swell

Little information is available near the centre of the cyclone. Cocos Island reported a moderate swell between 9<sup>th</sup> and 12<sup>th</sup> November. The ships appearing in table 3.2 reported seas of 2 m height and a maximum swell height of 4 m. From the satellite analysis it is likely that rough to very rough seas and a heavy swell would have been experienced near the centre from 10<sup>th</sup>-12<sup>th</sup> November.

(vii) Satellite Analysis

Data from selected satellite photographs is shown in table 3.3. In addition to these, nocturnal infra-red from NOAA 3 and further visual photographs from ESSA 8 were available.

On 5<sup>th</sup> November cumulonimbus activity was evident in the area which the cyclone developed. Some development occurred in the next 24 hours because on 6<sup>th</sup> November there was at least one curved cloud band and some cirrus outflow present. Approximately 12 hours later, visual photographs confirmed this development, however the cirrus outflow seemed to be uni-directional and further development did not occur until 9<sup>th</sup> November. Development ceased again on 10<sup>th</sup> November but the cyclone's intensity remained unchanged on 11<sup>th</sup> November. The system then weakened and by 14<sup>th</sup> November only a low level cloud centre could be found, with a large separation between it and the nearest dense overcast.

Table 3.1 Aircraft Reports

Aircraft	Position/ Height	Date/Time	Bearing Distance From centre (km)	Wind (km/h)
QF8	8°S 93°E 33000 ft	080053	WSW 350	Light and variable
-	8°S 93°E 35000 ft	081515	W250	ENE 56
QF8	8°S 93°E 33000 ft	100139	NW 190	NE 56
QF7	8°S 93°E 32000 ft	101526	NNW 200	Light and variable

Table 3.2 Selected Ship Reports

Ship	Position °S °E	Date/ Time (GMT)	Bearing/ Distance From centre (km)	Wind (km/h)	Sea (m)	Swell	Weather	Pressure (mb)
Daphne	12.5 93.0	11001	140/200	070/30	2	2	Showers	1004
Unique Alliance	13.5 88.2	11001	220/408	140/25	2	2	Past Shower	1008

Table 3.3 Data from Satellite Photographs

Satellite Name	Orbit Number	Date/Time (GMT)	Estimated posn. of centre °S	Estimated posn. of centre °E	Final T No.	Min. Sea Level Pressure (mb)
NOAA 3	4528	070130	6.7	96.3	2	1003
	4540	080044	7.7	96.1	2	1003
	4553	090154	8.4	95.2	3	994
	4565	100109	9.6	94.4	4	981
	4578	110219	11.1	91.1	4	981
	4590	120137	12.7	88.4	3.5	988
	4603	130244	13.0	87.9	2.5	999
	4615	140158	13.5	84.4	1.5	1003