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REPORT ON AN INTENSE HURRICANE

by

Captain Brett Hilder

M.V. "TULAGI" of London, 2746 tons

(manuscript received April 1959)

FRIDAY 13 March 1959; Noon position, 21°41' S, 168°42' E, about 30 miles east of Mare in the Loyalty Islands; steering 363° true, bound for Vila and Santo in the New Hebrides, and Honiara in the Solomons, where we had a rendezvous with the Duke of Edinburgh on the 19th March. A cyclone was reported 500 miles to the westward of our position, but during the afternoon it was reported to have recurved over New Caledonia and to be making straight for us.

At 5p.m. the position of the cyclone was 20.2°S, 166.3°E, centre of 978 mbs moving SE at 15 knots with winds of 50 knots and squalls up to 80 knots. This report was from Noumea. The ship was prepared for rough weather by lashing the hatches, boats, launches, life-boats, deck cargo and gangways. We still hoped to be able to continue our course with as much speed as possible in the head winds predicted.

At 6p.m. the glass had fallen to 29 inches, lower than the reported pressure at the centre, though the wind was only a fresh breeze from the NE.

At 7p.m. as the glass continued to fall, the crew were again turned to, to put more lashings on the boats and gangways. At 7.30p.m. the ship was headed into the wind, 024° true, at reduced speed, and we were therefore "hove-to" and prepared for the worst.

At 8p.m. the glass was down to 28.66 in., the lowest I had ever seen in a hurricane, and as the wind force was now exceeding gale force, I dashed off a weather report to Noumea in plain language. By the time I was writing "Wind 030 degrees" I had to put "Hurricane force".

At 9p.m. I noted the wind as 020 force 17, which indicates winds between 110 and 118 knots. This is not permitted in ship's weather reports, but only to shore

stations with instruments. The glass was still falling, but that was no longer of much importance compared with the fact that the ship's head could no longer be kept into the wind; the bow was now about 45° off the wind, and we were heading NNW. I called for full speed and for the next half hour or so tried to get the bow back into the wind by frequent use of full rudder, but with less and less success as the wind and sea increased and increased. By now the ship's head was about west, and as the wind had backed to about north, we were broadside-on to the hurricane. This was most alarming, and the ship was rolling so violently that the boats were straining their chocks, the deck cargo was breaking adrift, the gangways were being struck by heavy seas, and the spray and rain were driving horizontally. The whistle lanyard, rigged straight down the funnel to the deck for use when the electric control failed, now took the force of the wind and blew a steady blast on the whistle to the dismay of us all.

The bridge and wheelhouse were awash, as well as most of the passenger and crew accommodation, and we were being shot from side to side and badly bruised and shaken. The radar cabinet in the wheelhouse broke from the deck with a loud crack, but was held in place by superhuman efforts until it was shored into position by timbers; it had to be switched off and the power disconnected to save us from electrocution. My last glimpse of the screen showed bands of heavy rain like a spiral nebula, lying along the isobars, and about 20 miles to the westward were two horns in a semicircle possibly indicating the actual core of the storm. The rain bands extended about 30 miles to north and south of us, and might have made a good photograph, but the violent motion of the ship would have wrecked any attempts to rig the tripod to hold a camera, as well as preventing any steady time-exposure.

For the first time in my life I was in a ship which could not be brought up into the wind, though I had been in six hurricanes before. As it was too dangerous to remain broadside-on, we turned hard-a-port and came slowly around to South, with the wind astern. I reduced speed to slow, but we still appeared to be making speed down wind at an alarming rate. The time was about 9.30p.m.

We had not been running down wind for long when the wind fell away to a calm, the stars appeared overhead, and we had obviously reached the eye of the storm. The glass read 27.96 in. and the temperature was 77°F, but the bulb was hardly "Dry". We had taken some heavy seas over the stern. We could now expect the wind to come from the contrary direction, and the first cat's paws came from WSW, about force 3. So we turned hard-a-starboard at full speed, through west to north and on to 080° true with the wind right

astern. Speed was then reduced to half speed, and the wind was kept dead astern by watching the driving rain and spray passing the foremast light.

At 10.25p.m. the glass was up to 28 inches again; at midnight it was 28.70, and by 2a.m. it was up to 29 inches. The lowest reading had been at 9.50p.m., so that the glass was rising at the same rate as it had previously fallen over a total of 8 hours.

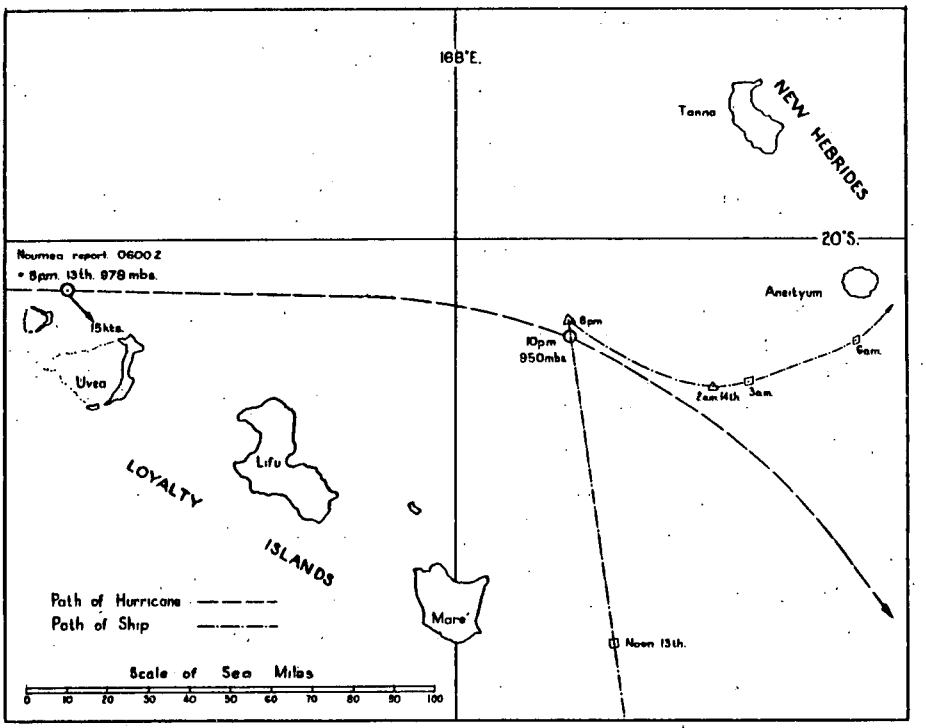

Fig.1. Chart showing apparent path of hurricane and track of ship.

At 2.a.m. we cleared the radio aerials and stray halyards away from the radar scanner, which they had been fouling, and switched on the set to have a quick look ahead to see if we were in range of Tanna or Aneityum Islands. At 3a.m. we switched the set on again and raised an island bearing 048°, distant 34 miles, when we altered course to 075° true, with the wind still astern. I thought that this island must be Tanna, from our rough D.R plot, and I proposed to double it south-about and get some shelter and possibly anchorage, at a bay on its eastern coast.

At 4a.m. the glass was up to 29.16, with the wind WSW force 6. When dawn broke the rain had cleared enough for use to see the island, which turned out to be Aneityum instead of Tanna, and we were 50 miles to the southward of our assumed position. During the six hours from

8p.m. to 2a.m. we made good a mean track of 115° true, and a distance of 40 miles, being carried along by the core of the hurricane along its track, despite the ship steering at right angles to the track.

At 8a.m. on the 14th we were off the SE corner of Aneityum, and were able to steer about NNE. The wind had dropped to a breeze but the swell was still rather mountainous, on our port quarter. By noon we were able to shape a course for Vila and resume full speed, having been a total of 16 hours in various forms of being "hove-to", out of control, and running before the storm.

NOTES AND COMMENTS

The ship is fitted with an aneroid barometer, which at 29.50 in. requires a correction of 0.066 in. (2.24 mb), which should be added to all the above readings. The lowest reading should therefore be 28.026 in., assuming that the error remains constant.

During the storm, which I insist on calling a hurricane, the wind and the barometer both changed with great regularity and steadiness. There was practically no gustiness in the wind, nor pumping of the barometer, both of which are normally characteristic of hurricanes in this area.

After the storm I estimated that the wind force had been between 100 and 200 knots. The greatest wind strength I had previously felt was on 30 January 1948, when the wind was about 120 knots near the centre, while at Lord Howe Island, some distance from the centre, the wind-force trace ran off the edge of the graph at 111 m.p.h.

To calculate the force of the wind from the pressure gradient I think that the position of the ship can be taken as almost stationary, at least for the first half of the time. The movement of the centre past the Loyalty islands appears to have been 24 knots until it reached the position of the ship. Allowing a movement of 23 knots from 8p.m. to 9.50p.m., during which time the glass fell from 28.66 to 27.96 inches, we get a gradient of 0.70 in. in a period of 1 hour 50 minutes, equal to a distance of 42 miles. This is a gradient of 24 mb in 42 miles.

If we assume that the radius of curvature of the trajectory of the air is of the order of 100 to 250 miles the gradient wind will be of the order of 150 to 200 knots. As a matter of interest to professional meteorologists who might wish to estimate the gradient wind from an estimate of the radius of curvature of the trajectory the barometer readings and positions of M.V."Tulagi" are appended. Amended positions of the cyclone centre might be available from Noumea or Nandi Meteorological Offices.

APPENDIX

NOTE: Ship's time 11 hours ahead of G.M.T.

M.V."Tulagi" positions: Noon 13th 21°41'S; 168°42'E; 353° 10½ kts;
8p.m.D.R 20°20'S; 168°33'E; hove-to;

14th 2a.m D.R 20°37'S; 169°08'E; 075° 8½ kts;
3a.m Fix 20°36½'S;169°16½'E;075° 8½ kts.

Uncorrected barometer readings (in.) and temperatures in °F

13th Noon 29.35 80°F 4p.m.29.16.80°F 6p.m 29.00 -. 8p.m 28.66 78°F

8.50p.m 27.96 77°F 10.25p.m 28.00 - 11p.m 28.32 -

14th 00.45a.m 28.76 01.15a.m.28.96. 2a.m 29.00 4a.m 29.16. 4p.m 29.43

All these readings should be increased by 0.066 in. (2.24 mb) to give mean sea level readings.

Storm warnings received:-

12th/2025Z Nandi; Gale warning at 1800Z moderate tropical storm centred near 18 S, 160 E; moving South at 8 kts; centre below 990 mbs expect winds to 45 kts within 100 miles.

13th/0810Z Noumea Gale warning; depression 986 mbs; 19.8S, 165.3E; moving ESE at 12 kts; winds 50 kts, squalls to 70 kts within 80 miles of centre.

13th/0826Z Noumea Tropical Cyclone 978 mbs 20.2S, 166.3E; moving SE at 15 kts; winds of 50 kts and squalls of 80 kts within 150 miles.

13th/0835Z Nandi Severe tropical storm centred 20.2S,165E; central pressure below 980 mbs mvoing SE at 15 kts; winds to 50 kts within 80 miles of centre.

13th/2123Z Nandi Severe tropical storm centred 23.5S, 170.5E; 985 mbs moving SE at 30 kts; movement and position poor; expect winds to 50 kts within 100 miles of centre.

14th/0010Z Nandi Severe tropical storm at 13/1800Z was centred near 23.5S, 170.5E; 985 mbs moving SE at 30 kts.

14th/0600Z Nandi Part 1 warning tropical area nil.....