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Outline of Incident

On the 2nd September 1986 at 0205 hours Eastern Standard Time the Malaysian general purpose Freedom type cargo vessel ALAM INDAH of 9094 gross tons, on passage from Penang, Malaysia, to Mackay, Australia, ran aground on Chapman Island Reef in position 12 degrees 53 minutes South 143 degrees 36 minutes East. The vessel was refloated, without assistance, at about 0527 hours Eastern Standard Time and, after an inspection for damage and seaworthiness by the ship's Officers, resumed passage to Mackay at 0606 hours Eastern Standard Time on the 2nd September 1986. There was no report of injury to any person nor of any pollution occurring as a result of the grounding.

At the time of the investigation on the 4th September 1986 the vessel was berthed at the Sugar Terminal at Mackay. A Bureau Veritas classification surveyor and a team of divers were in attendance to assess the damage to the vessel. The vessel was found to have sustained no material damage and was seaworthy. The Alam Indah sailed from Mackay at 2015 hours 5 September 1986 for the port of Kelang.

Authority to Conduct Investigation

On the 4th September 1986 [REDACTED], an officer of the Federal Department of Transport, was appointed under sub-section 377A(1) of the Navigation Act 1912 to make a preliminary investigation into the circumstances of the grounding of the M.V. Alam Indah in the vicinity of latitude 12 degrees 53 minutes South 143 degrees 36 minutes East on the 2nd day of September 1986 and in particular:-

the factors which caused or contributed to the grounding

the reasons why the vessel did not utilise the services of a licensed pilot in an area where a pilot is recommended by the International Maritime Organization

the actions taken by the Master and crew to protect life, property and the environment after the grounding.

Persons Interviewed

The investigation was carried out on board the M.V. Alam Indah at the Sugar Terminal at Mackay and the following persons were interviewed:-

- | | |
|----------------------|----------------|
| ████████████████████ | Master |
| ██████████ ███ █████ | Chief Officer |
| ████████████████ | Second Officer |
| ██████ ███ █████ | Able Seaman |

Details of Vessel

Official Number	325942
Call Sign	9MAE8
Port of Registry	Port Kelang
Nationality	Malaysian
Owners	Pari Shipping Sdn., Bhd., Kuala Lumpur
Managers	Pacific Ship Managers Sdn., Bhd., Subang Jaya
Agents	Dalgety Shipping, Mackay
Builders	Ishikawajima-Harima Heavy Industry Corp., Tokyo
Date Built	November 1970
Ship Type	Freedom Class - Multi-purpose Dry Cargo
Main Engine	One IHI-SEMT Pielstick 12PCZV Diesel
BHP	3800 kW
Gross Tonnage	9094
Nett Tonnage	5477
Length Overall	142.252 Metres
Breadth	19.812 Metres
Depth	12.344 Metres
Summer Draught	9.055 Metres
Summer Deadweight	15,135 M.T.
Summer Displacement	19,129 M.T.

Certificates

Loadline Certificate	Issued by Bureau Veritas on 9th June 1985 Valid to 9th June 1990 Annual Endorsement on 9th July 1986
Safety Construction Certificate	Issued by Bureau Veritas on 10th June 1985 Valid to 9th June 1990 Annual Endorsement on 9th July 1986
Cargo Ship Safety Equipment Certificate	Issued by Bureau Veritas on 13th August 1986 Valid to 12th October 1986
Cargo Ship Radiotelegraphy Certificate	Issued by Bureau Veritas on 11th December 1985 Valid to 10th December 1986

Sequence of Events

Leading up to the Grounding

On the 23rd August 1986 the Alam Indah sailed from Penang, Malaysia, in ballast, bound for Mackay to load a cargo of sugar. The route for the voyage was to take the vessel through the Great Barrier Reef using the recommended Two-Way Route printed on the chart.

A licensed pilot of the Queensland Coast and Torres Strait Pilot Service was not engaged, apparently as it has been company policy for the Master to take the ship through the reef when in ballast and to engage a pilot for the loaded passage. The Master stated that he was unaware of the International Maritime Organization's recommendation for pilotage in the reef area until he was handed a copy of Marine Order 14/1986 at Mackay.

At 0815 hours on 1 September 1986 the vessel passed Carpentaria light vessel. At 1138 hours that day, Booby Island was bearing 339 degrees true at 1.8 nautical miles, at which time the course was altered and the reef passage was considered to have started. The draught of the ship for the passage was stated to be 2.7 metres forward and 5.2 metres aft, a trim by the stern of 2.5 metres.

The Master stated that no difficulties were encountered during the passage, visibility was very good, the sky was only partly clouded, the wind was from the south-east at between force 5 and force 6, the sea was rough and the swell was from the south-east, one to two metres in height.

All navigational equipment was stated by the Master to be in good working order. The vessel was equipped with two 3 cm radars, one of which was newly fitted at dry-dock in February and was the radar in use during the reef passage, with the other radar switched on to stand-by. It was stated that the gyro compass was operating satisfactorily and the error was checked on transit bearings of lights whenever possible. The error was found to vary between 1 degree high and one degree low and was considered by the Master to be 0.5 degrees low at the time of grounding. The echo-sounder was in operational condition but was not being used, as the Master considered that it was not necessary at this draft.

At 2350 hours on 1 September 1986 the vessel altered to a course of 152 degrees true at a position off Eel Reef light, on chart Aus 834, and maintained the course-line towards the next alteration point off Wye Reef light. Between 2400 and 0100 hours the speed was 15 knots and between 0100 and 0142 hours, the time of the beam bearing off Wye Reef, 14.1 knots. The vessel at this time was in hand steering. No separate specialist lookout was stationed. The Master stated that he was "assisting" as a lookout while present on the bridge.

At 0120 hours the Second Officer ascertained the vessel's position by means of a visual bearing and radar distance of Wye Reef light. At 0125 the Master again ascertained the vessel's position using the same method. At this time both Wye Reef light and Chapman Island light were clearly visible.

Having marked the vessel's position on the chart the Master stated that he told the Second Officer that he was going down to the toilet. He had apparently been on the bridge continuously since about 1800 hours the previous day. He maintained that he pointed out both Wye Reef light and Chapman Island

light to the Second Officer and told him to alter course to 176 degrees true at the alteration position off Wye Reef light shown on chart Aus 834. The Second Officer, however, maintained that the Master gave no such instruction, but merely stated that he was "going down". The lookout heard the Master state his intention of leaving the bridge for a period of fifteen to twenty minutes. The Master asserted that he had no doubts about the Second Officer's competence to make this alteration as he had sailed with him since the 7th July 1986 and it was the Second Officer's fourth passage through the reef. At 0130 hours the Master left the bridge leaving the Second Officer in charge of the vessel.

The Second Officer stated that he fixed the position at 0130 hours by means of a radar bearing and distance from Wye Reef lighthouse; again at 0137 hours by means of radar distances from Cape Direction and Wye Reef lighthouse; and at 0142 hours by means of a radar bearing and distance from Wye Reef lighthouse. This last position showed that the vessel was at the position where the alteration of course to 176 degrees true was to be made. The alteration, however, was not made at this time.

At some time, said by the Quartermaster to be between 0145 and 0155 and put by the Second Officer at 0147, the Second Officer ordered an alteration of course. The Second Officer further stated that at 0148 he checked the compass and that it was showing 176 degrees true. The Quartermaster, however, stated that he applied ten degrees of port rudder. At the same time the Second Officer took a radar bearing of Cape Direction which he stated to be 254 degrees true and 2.8 nautical miles distant. This position showed a run of only 0.5 miles in the five minute period.

The Second Officer apparently took two further positions by radar, marked with the time 0150 hours. He stated that he attempted to check this position by visual compass bearing, but was not sure that the compass was correct. He was totally unsure of the position of the vessel at this time and uncertain of the method he could use to rectify the situation.

According to the Quartermaster, the vessel had developed a comparatively rapid swing to port when, at a time said by the Second Officer to be 0203, he received the order 'starboard twenty' and fairly shortly after that 'hard a-starboard'. No times have been recorded for these orders.

The vessel was developing a swing to starboard when a shuddering motion was felt and the vessel stopped in the water at a time recorded as 0205 hours.

At no time from about 0150 hours, when he realised that he was uncertain of the vessel's position, until the grounding did the Second Officer attempt to call the Master back to the bridge. He stated that he was aware that the International Chamber of Shipping Operational Guide for Officers in Charge of a Navigational Watch recommends this action, even though he had not read the Master's standing orders.

The Master stated when interviewed, and in a statement made under the provisions of the Navigation Act, that he had just left his accommodation to return to the bridge when he felt the vessel shuddering at a time stated to be 0153. He ran to the bridge to find the Second Officer standing by the engineroom telegraph, in a dazed condition. The ship was stopped in the water about 0.5 miles from Chapman Reef light, with the engineroom telegraph on full ahead, the rudder hard to starboard and the vessel's head on 195 degrees on the gyro compass.

After the Grounding

Upon realising that the vessel was aground the Master ordered the engine to be stopped and at the same time ordered emergency stations to be sounded so that the crew could be mustered for a check for injuries and be available for such duties as the emergency situation would require.

The Chief Officer was ordered to sound all the tanks to check for ingress of water and to have each hold thoroughly examined for damage to the tank tops and the hull. As the forepeak tank was empty it was entered by men wearing breathing apparatus, in case of oxygen deficiency, and thoroughly examined for damage.

The state of the tide was checked and it was calculated that the next high water would occur at 0817 hours with a height of 2.44 metres. As the vessel had grounded close to the time of low water the Master was reasonably confident that the vessel could be refloated without assistance, provided that no rupturing of tanks had occurred.

To reduce the draft of 2.7 metres forward, before attempting to refloat the vessel, the Master decided to de-ballast the following tanks, once the watertight integrity of the vessel was assured:-

No. 1 double bottom, port and starboard
No. 1 topside tanks, port and starboard
No. 2 double bottom, port and starboard
No. 2 topside tanks, port and starboard

and to ballast:-

No. 4 topside tanks, port and starboard

At 0243 hours the visual inspection of the forepeak tank and all holds and tank tops was completed with no damage being found. The sounding of all tanks was also completed with no variation in soundings being recorded.

The Master ordered that the depth of the water surrounding the vessel be ascertained and at 0303 hours the following depths were recorded:-

At the forefoot		0.0m
By No. 1 hold	Port 1.2m	Starboard 1.2m
By No. 3 hold	Port 10.4m	Starboard 5.2m
By No. 4 hold	Port 10.4m	Starboard 6.4m
By the bridge front	Port 17.4m	Starboard 15.5m
Amidships at stern		17.8m

At 0305 hours the Master was satisfied that the vessel was watertight so at 0310 hours the previously determined change in the ballast pattern was put into operation.

At 0330 hours on the 2nd September 1986 the Master decided to commence the attempt to refloat the vessel. At 0334 hours the engine was put on stand-by and then slow astern, at 0338 hours full astern and at 0354 hours the engine was stopped. The engine was then put ahead for two minutes and the rudder turned from hard to port to hard to starboard to create a swinging action that would help to break the suction of the sandy bottom on the vessel's forefoot.

The astern and ahead manoeuvring of the engine, combined with use of the rudder, continued until it was noticed that the vessel was starting to gather sternway at 0513 hours with the engine running on full speed astern. The engine was kept on full speed astern until the vessel was clear of the reef at 0527 hours on the 2nd September 1986, the officially recorded time of refloating in the vessel's log books. At 0527 hours the engine was stopped and then put ahead to take the vessel clear of Chapman Island while another check on the watertight integrity was carried out.

At 0606 hours the Master was satisfied that the vessel was seaworthy and the passage to Mackay was resumed. Once on passage the Master advised his owners and agents of the grounding and subsequent refloating but, although he was participating in AUSREP, he neglected to advise Sea Safety, Canberra. He stated that he had been under considerable stress because of the grounding and efforts to refloat and had forgotten it was necessary to advise this centre.

The vessel berthed at Mackay at 1000 hours on the 4th September 1986 and the bottom was inspected for damage by a team of divers from Smit Marine Pty Ltd, under the supervision of Mr [REDACTED], a Bureau Veritas Surveyor. A rope was led from one side of the ship to the other, under the bottom, as a guide for the divers and was moved aft, a metre at a time, until the whole bottom had been thoroughly examined.

Only two minor areas of indentation were found, one two metres and another four metres from the forward perpendicular, with the maximum depth of indentation being 1.25 centimetres. Paintwork damage was extensive, being taken back to bare metal in places. This damage was estimated by the divers to be 70% of the area at the bow diminishing to 10%, six metres aft of the start of the bilge keels.

The vessel's Bureau Veritas Hull Certificate was endorsed 'bottom to be specially examined forward of frame 90 at next dry docking within February 1988'.

Observations

1. Only two men were on the bridge between 0130 and the time the vessel ran aground, Mr [REDACTED], Second Officer, in charge of the watch and Mr [REDACTED], A.B., who was Quartermaster for the 12 to 4 watch. Their statements about the helm orders that were given completely disagreed.

The Second Officer stated that at 0147 he gave the helm order 'starboard to 176' and saw 10 degrees of starboard helm on the rudder indicator and also saw the ship's head swing to starboard, he also stated that he made a check to ensure that the vessel had settled on the true course of 176 degrees on the gyro compass.

The Quartermaster stated that he was given the order 'port ten' and that he repeated the order back to the Second Officer, who did not confirm that he had heard the repeat of the order. He stated that as the vessel developed a quite rapid swing to port he was given the order 'starboard twenty' and shortly afterwards 'hard a-starboard'.

The Chief Officer, Mr [REDACTED], in his statement said that he attended a meeting between the Master and the Second Officer on the 3rd September 1986. The Chief Officer stated that at that meeting the Second Officer admitted that he had, in fact, ordered port helm at the time he had intended to come to starboard onto the new course line.

2. The statements made by the Master, Captain [REDACTED], and the Second Officer also disagreed. The Master stated that he told the Second Officer that he was to alter course at the position off Wye Reef light and pointed out Wye Reef and Chapman Island lights to the Second Officer. The Second Officer stated that the Master said only 'I am going down'.

No satisfactory evidence was given as to why the 2nd Officer failed to alter course at 0142, when the ship was abeam of Wye Reef, but allowed the ship to run on for what was stated to be a further five minutes, an advance in excess of one mile.

The statements of these two Officers also disagreed over the weather conditions. The Second Officer stated that the visibility was not very good while the Master stated that the visibility was very clear which agrees with log book entries.

Notwithstanding the Master's stated confidence in the Second Mate's competence, no satisfactory explanation was offered as to why, acknowledging the need to go to the lavatory, the Master made no attempt to return to the bridge for the alteration of course off Wye Reef. In making the observation due regard is taken of the company policy of not employing a pilot on ballast voyages through the inner route of the Great Barrier Reef. The Master stated he felt the ship shudder at 0153, however did not arrive on the bridge until after 0200.

3. The distance from Wye Reef to the point of grounding is 3.4 miles. Allowing for the rudder movements described earlier in the report it is possible that the ship made good a speed of 8.87 knots between 0142 and the stated time of grounding at 0205. However it is probable that the

time of grounding was closer to 0200. The times given for the stated helm movements, and the relative heading of the ship at grounding are not consistent with the probable manoeuvring characteristics of such a vessel in ballast and trimmed 2.5 metres by the stern. The time stated by the Second Officer of 0203 for ordering starboard helm would be more consistent with the time of grounding, but not with the wheel being put 10 degrees to port at 0147 approximately.

In this connection it should be noted that the time of grounding as entered in the Chief Officer's log and in the Engine Room log book had been altered from 0155 and 0201 respectively to 0205. Also pencil notations on the chart made a note of 0200 as the time of grounding.

Had the Second Officer applied full port rudder or shaped to pass on the east side of Chapman Island the casualty may have been avoided.

4. In the course of his interview the Second Officer stated that he was unsure of the reliability of the gyro compass as he had not taken a compass error during the course of the watch. He attributed the grounding to compass error.

The Second Officer's evidence must be weighed against the apparently reliable positions obtained up to and including 0142; and the evidence of the Master, who stated that he had checked the compass by transit bearings and was confident that the compass error did not exceed 1 degree high or low.

5. The average speed of the Alam Indah was in the region of 14.5 knots. The time of the beam bearing off Wye Reef was consistent with the speed made good since 2400. The Second Officer used a bearing and distance from Wye Reef alone for this position.

To fix the ship's position at 0147 the Second Officer used a bearing and distance from Cape Direction, changing the reference point through 180 degrees without any cross bearing and distance. The run shown from 0142 to 0147 of 0.5 miles is not consistent with the ship's speed in the preceding hour and three quarters.

It is probable, from the evidence given, that from 0130 onwards and from 0142 in particular, the Second Officer navigated solely on the radar and did not keep a visual lookout or make a visual assessment of the developing situation.

6. The Master stated that he had seen Chapman Reef light at or before 0130. The Second Officer stated that he saw Chapman Reef light when abeam of Wye Reef. No reports have been received to indicate that the light was anything other than fully operational.
7. In view of the differences apparent in the various statements, the basic difference in the Second Officers statement as compared to the statements of the other three witnesses, the Second Officer's evident confusion at the time he made the statement and his inability to provide a cogent explanation for the grounding, I consider that his statement should only be given weight where separate corroborative evidence exists.

CONCLUSIONS

I find that:

- 1) The 2nd Officer, Mr [REDACTED], failed to alter course at 0142 when abeam of Wye Reef light or at some time subsequent to 0142 to avoid Chapman Island Reef and to keep the vessel on the track laid down. After 0142 Mr [REDACTED] displayed poor seamanship in that he failed to fix the ship's position in a proper and accurate manner and to keep a visual check on the ship's progress. He also failed to call the Master when unsure of the ship's position.
- 2) The Master absented himself from the bridge for a prolonged period from 0130 hours to the time of grounding. He failed to supervise the alteration of course at 0142, which would have been proper for him to oversee given the absence of a pilot and the relatively narrow waters in this area.
- 3) At a time, said to be 0147 the helm was applied 10 degrees to port instead of to starboard to keep the ship to the recommended two-way route. The Second Officer either gave the wrong helm order or he failed to observe that the rudder had been applied in the wrong direction. In view of the position of the grounding, and the evidence of the Master, Chief Officer and Quartermaster which is in conflict with the evidence of the 2nd Officer, it is probable that an order for port helm was given by the 2nd Officer.
- 4) The voyage had apparently proceeded in a routine manner until 0130 hours 2 September 1986. At 0130 the Master left the bridge and failed to ensure that the bridge was manned in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, in that no separate lookout was kept.
- 5) The times given in evidence do not alter the basic cause of the grounding, and under the circumstances it would be unreasonable to expect precise times from the witnesses. There are however inconsistencies that should be noted. Most of the reported times and therefore the positions of the helm orders, to which they relate, are not consistent with the time of grounding. It is probable, given the trim and ballasted state of the ship, that had the helm been applied at the times stated the vessel would not have grounded on Chapman Island but would have passed to the north of the reef. It follows that the vessel probably remained on the course of 152 degrees until some time after 0150.

The statement of the 2nd Officer, that he ordered and saw 10 degrees of starboard helm and confirmed that the compass was showing a course of 176 degrees true, is not consistent with grounding on Chapman Reef.

The account of the degree and timing of helm applied provided by the Quartermaster, should have allowed the ship to pass north of the reef given the ship's trim.

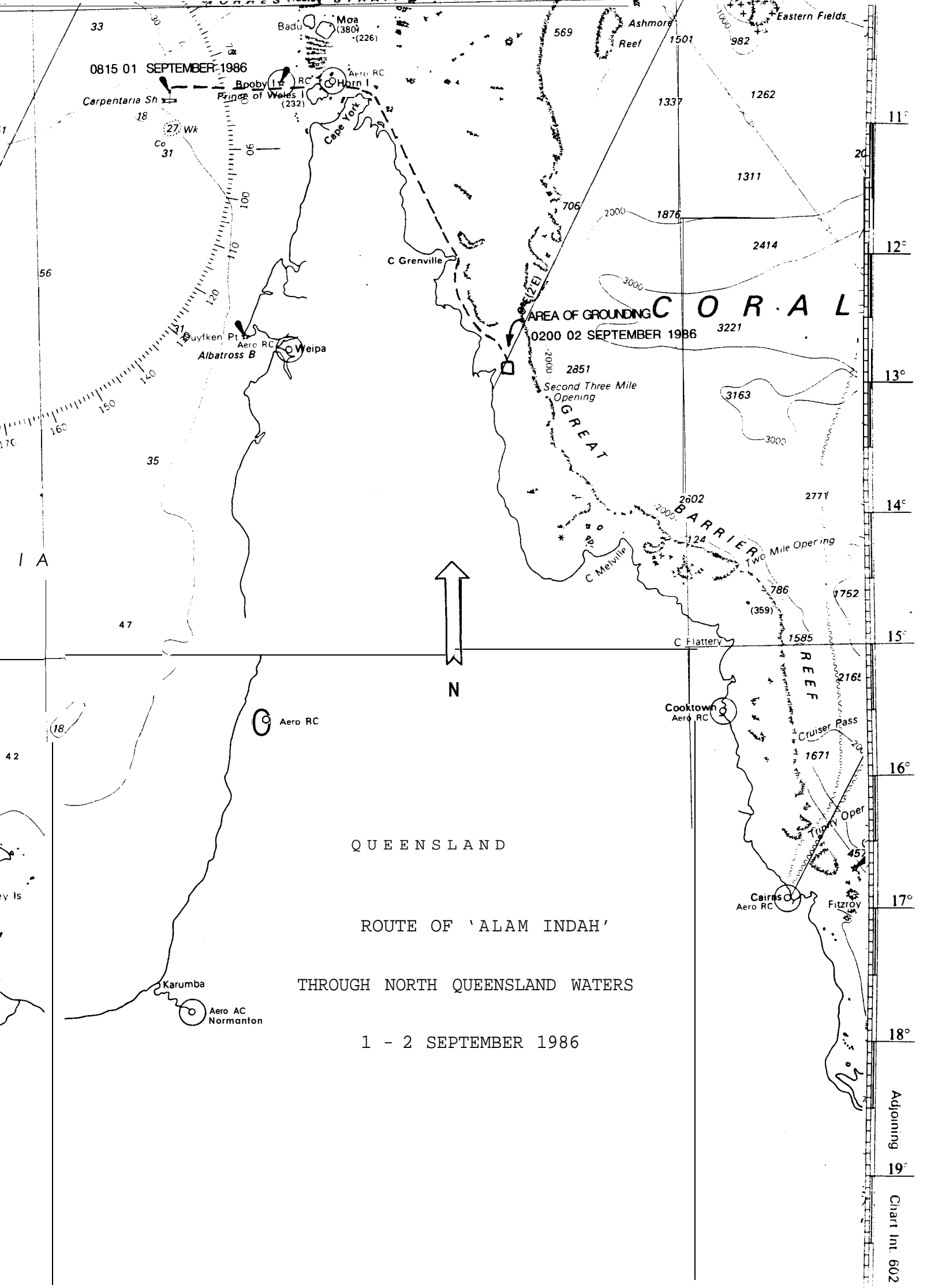
- 6) There is no evidence to suggest that there was any gyro compass error of sufficient magnitude to cause this casualty.

- 7) The Master did not engage the services of a pilot from the Queensland Coast and Torres Strait Pilot Service in line with his understanding of the preference of the Ships Managers, Pacific Ship Managers Sbn. Bhn., of Subang Jaya, for ships under their management to engage a pilot for loaded passages only.

This practice is contrary to the International Maritime Organization (IMO), Maritime Safety Committee, circular MSC/Circ 430, which has been issued pending adoption of a draft resolution by the IMO Assembly in November 1987.

The circular recommends that ships of 100 metres in length and over, and all loaded oil tankers, chemical carriers or liquefied gas carriers, irrespective of size, use the pilotage services provided by the Queensland Coast and Torres Strait Pilot Service when navigating in the Torres Strait and inner route of the Great Barrier Reef area between Booby Island (latitude 10° 36' south, longitude 141° 54' east) and latitude 16° 40' south or through the Great North East Channel, or Hydrographers Passage.

- 8) The action of the Master subsequent to the grounding and the precautions taken in refloating his ship were carried out in a proper, prudent and seamanlike manner.
- 9) The light on Chapman Reef was fully operational.



33

0815 01 SEPTEMBER 1986

Carpentaria Sh

27 Wk

Co 31

Badu (380)

(226)

Booby I

Prince of Wales I (232)

Cape York

C Grenville

Suyfken Pt

Albatross B

Aero RC

Weipa

569

Ashmore Reef

1337

982

Eastern Fields

1262

1311

2414

AREA OF GROUNDING

1020 02 SEPTEMBER 1986

3221

2851

Second Three Mile Opening

3163

3000

GREAT

2602

2000

BARRIER

124

Two Mile Opening

786

(359)

1752

C Flattery

1585

REEF

2162

Cruiser Pass

1671

Oper

45

TILLY

Oper

45

Cairns

Aero RC

Fitzroy

17

I A

47



N

11°

12°

13°

14°

15°

16°

17°

18°

19°

QUEENSLAND

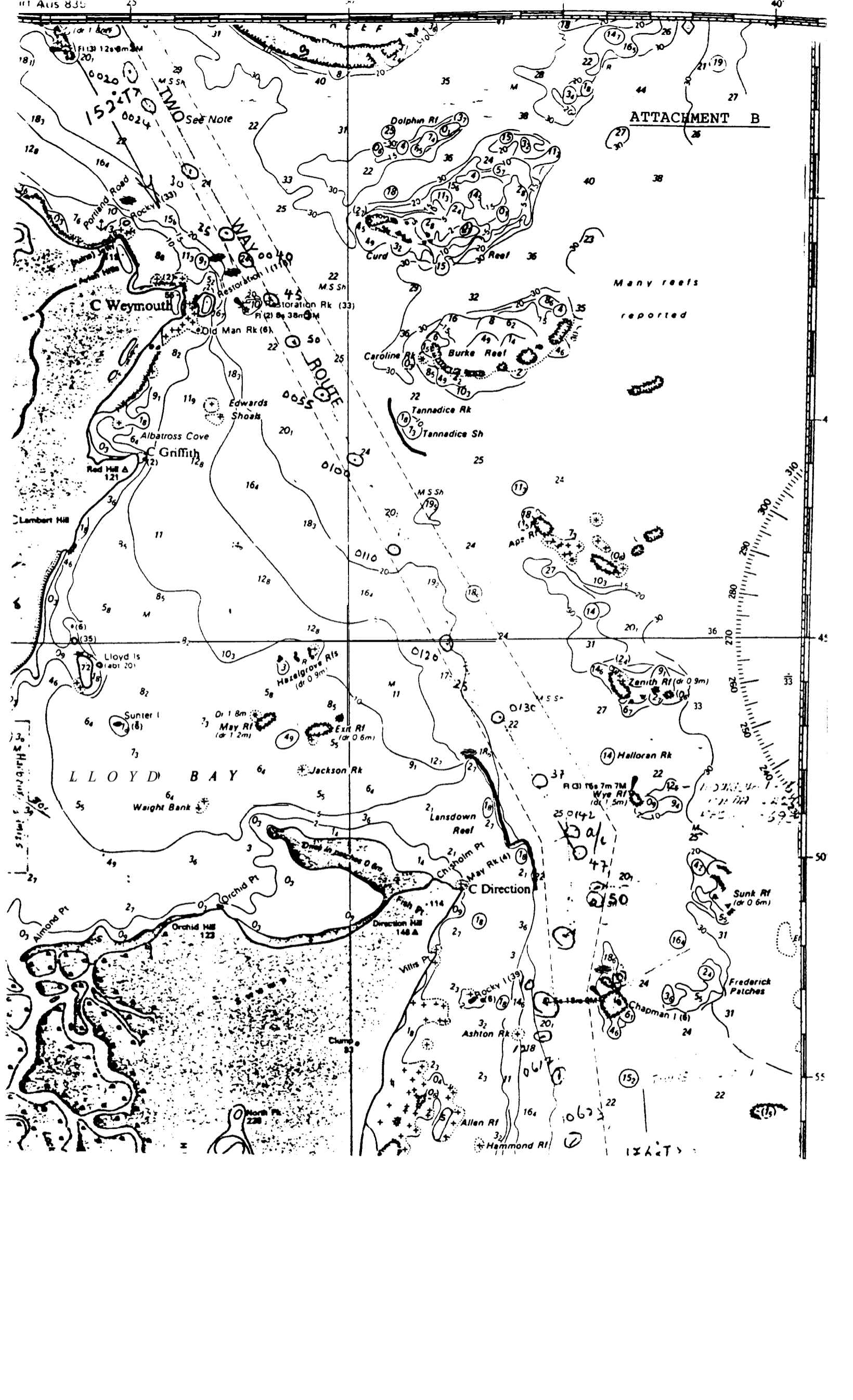
ROUTE OF 'ALAM INDAH'

THROUGH NORTH QUEENSLAND WATERS

1 - 2 SEPTEMBER 1986

Adjoining

Chart Int. 602



ATTACHMENT B

Many reefs reported

1524 TMO See Note

LLOYD BAY

Wye Rf (dr 1.5m)

Zenith Rf (dr 0.9m)

C Direction

150

152

1524 TMO

DISTANCE SPEED TRAVELLED-ALAM INDAH - 2 SEPTEMBER 1986

2400 - 0150

2400												
2.4	0110											
4.9	2.55	0020										
5.8	3.4	0.82	0024									
7.55	5.2	2.6	1.8	0030								
9.9	7.7	5.0	4.15	2.4	0040							
15.0	12.7	10.2	9.22	7.6	5.0	0100						
17.4	15.0	12.4	11.6	9.8	7.4	2.25	0110					
19.9	17.4	14.9	14.0	12.35	9.85	4.8	2.55	0120				
21.8	19.4	16.9	16.0	14.45	12.0	6.9	4.6	2.05	0130			
25	22.5	20.0	19.2	17.4	15.0	9.9	7.7	5.2	3.1	0142		
25.5	23.0	20.5	19.7	17.9	15.5	10.4	8.2	5.85	3.6	0.5	0147	
26.7	24.2	21.7	20.9	19.1	16.7	11.6	9.4	6.9	4.75	1.7	1.2	0150

- Distance in nautical miles -

2400												
14.4	0010											
14.7	15.3	0020										
14.5	14.57	12.3	0024									
15.1	15.6	15.6	14.0	0030								
14.85	15.4	15.0	15.56	13.4	0040							
15.0	15.24	15.3	15.33	15.2	15	0100						
14.9	15.0	14.88	15.13	14.7	14.8	13.5	0110					
14.93	14.9	14.9	15	14.82	14.77	14.4	15.3	0120				
14.53	14.55	14.48	14.54	14.42	14.4	13.8	13.8	12.3	0130			
14.7	14.7	14.6	14.7	14.5	14.52	14.14	14.44	14.2	15.5	0142		
14.2	14.2	14.3	13.7	13.9	13.88	13.34	13.3	12.99	12.7	6.0	0147	
14.5	14.52	14.47	15.48	14.32	14.3	13.92	14.1	13.8	14.25	12.75	24	0150

- Speed in knots -