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OUTLINE OF INCIDENT

On 21 April 1987 at approximately 0710 ships time (0810 E.S.T.) the Cypriot registered cargo vessel "RUCA CHALLENGE" of 1587.46 gross tons on passage from Haifa, Israel to Cairns, Australia, via Singapore, with a cargo of potassium nitrate, ran aground on Piper Reef in position 12° 14' 80" S 143° 14' 40" E.

(Prior to the grounding the ship's time was UTC + 9 hours. The clocks were altered at noon 21 April, to align with Eastern Standard Time (E.S.T.) being UTC + 10 hours. All times given in this report are based on the 24 hour clock and are EST).

The vessel was refloated without external assistance at approximately 1700 on 21 April and, after establishing that the vessel was seaworthy, the Master continued the voyage to Cairns, berthing at 2030 on 23 April. No pollution resulted from the grounding.

Cargo was discharged on 24 and 26 April and the vessel sailed at 1350 on 26 April for Brisbane to complete discharge of the potassium nitrate. Off Fitzroy Island, the vessel anchored to allow a Lloyds Register classification surveyor, together with a diver, to make a more detailed hull inspection in clear water. Some hull damage was noted, however the vessel was considered to be in a seaworthy condition and continued on passage to Brisbane.

After further inspection by Lloyds Register and on completion of discharge, the vessel sailed from Brisbane on 2 May 1987. Repairs were undertaken whilst in Brisbane and are due for completion at the next drydocking, in 1988.

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AUTHORITY TO CONDUCT INVESTIGATION

On 21 April 1987 DAVID RHYS OWENS a marine surveyor in the Federal Department of Transport, was appointed under section 377A of the Navigation Act 1912 to make a preliminary investigation into the circumstances of the grounding of the M.V. 'RUCA CHALLENGE" in the vicinity of latitude 12 degrees 15 minutes south, longitude 143 degrees 15 minutes east on 21 April 1987 and in particular

the factors which caused or contributed to the grounding

the reasons why the vessel did not utilize 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 "RUCA CHALLENGE" at Cairns and also at the Department of Transport's Cairns Office, Hartley Street, Cairns.

Persons interviewed - JACOB BLOKZIJL ..... Master  
Dutch Masters Certificate under  
5000 tonne Gross No SO-45709  
DONALD MATTHEW MILLER . . . Chief Mate  
British Master home Trade Passenger  
Ship No 113904  
Panama Master Middle Trade under  
10,000 Gross No 11A-05275  
Honduras Coastal Master No 3727

Both the Master and Chief Mate made written statements and signed their 'Record of Interview'.

The second form MO - 31/8 containing 'a more complete statement of events was submitted on 30/4/87 in Brisbane.

DETAILS OF VESSEL

SHIPS NAME:	Ruca Challenge
OFFICIAL NUMBER:	7435149
PORT OF REGISTRY:	Limassol
NATIONALITY:	Cypriot
NAME & ADDRESS OF OWNERS:	Ruca Challenge Shipping Company Ltd Tribune House, 10 Skopa St NICOSIA, Cyprus
NAME & ADDRESS OF MANAGER:	De Groot's, Scheepvaartbelangen, Kolmeer 12 8604 E.S. SNEEK, Holland
NAME & ADDRESS OF LOCAL AGENTS:	Patrick Agencies, 112 Abbott St, CAIRNS 4870
NET TONNAGE:	1125.66 Tons
GROSS TONNAGE	1587.46 Tons
SUMMER DEADWEIGHT:	3055 Tonnes
SUMMER DISPLACEMENT:	4025 Tonnes
SHIP TYPE:	General Cargo
WHEN BUILT:	1978
WHERE BUILT:	Greece
MAIN ENGINE:	Burmeister & Wain Alpha
BRAKE HORSE POWER:	2320
LENGTH OVERALL:	79.98m
BREADTH:	13.79m
DEPTH:	5.28m
SUMMER DRAUGHT:	5.34m
NAVIGATIONAL AIDS:	RADAR Decca 10cm RM 1216 C SATNAV Navstar A - 3005 VHF EPSCO R.T.78 ECHO SOUNDER Kelvin Hughes MS45 RADIO ITT Marine ST 350 C AUTO PILOT Plath Navigat III Dh1-059

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CURRENT CERTIFICATES:

Loadline:

Issued by Lloyds Register  
on 23.5.86  
Valid to 22.5.91  
Annual Endorsement N/A

Safety Equipment:

Issued by Lloyds Register  
on 23.12.86  
Valid to 22.5.88  
Annual Endorsement N/A

Safety Construction:

Issued by Lloyds Register  
on 15.9.86  
Valid to 22.5.91  
Annual Endorsement N/A

Safety Radio Telephony:

Issued by Lloyds Register  
on 14.5.86  
Valid to 14.5.87  
Annual Endorsement N/A

Safe Manning Document:

Issued by Republic of  
Cyprus on 27.6.86  
See Attachment C.

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SEQUENCE OF EVENTS

(a) Leading up to the grounding

On 24 February 1987 "RUCA CHALLENGE" sailed from Haifa Israel with a cargo of potassium nitrate for Cairns and Brisbane, bunkering at Singapore en route, where unscheduled minor engine repairs were also undertaken.

The Master had apparently considered taking a pilot for the passage through the Barrier Reef, however in view of orders from the vessel's owners not to do so unless the pilotage was compulsory, he decided to navigate without the assistance of a pilot. Large scale charts of the Barrier Reef were ordered in Singapore. These were delivered to the ship with the exception of chart AUS 835 which was out of stock.

The voyage proceeded normally from Singapore with the Master on watch between 0800-1200 and 2000-2400 hours, the Chief Mate 0400-0800 and 1600-2000 hours and the Second Mate 0000-0400 and 1200-1600 hours. All navigational equipment was stated by the Master to be in a satisfactory working order. The Chief Mate made the comment that the radar bearing cursor was not precise enough but made no other criticism of any navigational equipment.

No lookouts were posted during the hours of darkness and no seaman made available for steering duties. The auto pilot was therefore in use at all times unless overridden by the watch officer.

The Chief Mate took over the watch at 0400 on 21 April and confirmed the ships position at that time. Regular checks were made using radar ranges and bearings to 0500, when course was altered to 212° True (T) when Clerke Island was bearing 238°(T), 1.5 miles. Between 0500 and 0600 position checks using radar ranges and bearings were made at 0528, 0542 and 0556. At 0600 course was altered to 175°(T) when

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Moody Reef Light was bearing 090° distance, 1.2 miles. Position checks were made at 0610 and 0617. At 0617 with Young Reef beacon bearing 265° (T), distance 1.3 miles, which was the last position shown on the chart, the Chief Mate stated that he allowed 5° leeway to counteract weather conditions from the South East and was therefore steering 170°(T) to make good a course of 175°. (This leeway allowance was not shown in the Deck Log Book).

No further positions are shown on Chart AUS 375 and the vessel grounded on Piper Reef sometime around 0705 to 0710. The visibility at 0600 was reported to have been about 8 miles with no rain squalls in the area.

The Chief Mate claimed that he took subsequent positions after 0617, but they were later erased owing to the scale of the chart in use (1-300000). He had set a course to pass 1 mile to the west of Inset Reef Light and 1.5 miles to the east of Farmer Island.

Whether additional position checks were made after 0617 cannot be verified but by 0645 at the latest, it should have been possible to accurately establish the ships position using Fisher Island (46 feet) and both Inset Reef and Piper Island beacons. However, the ship's position did not appear to be established. At 0700 the Chief Mate altered course to starboard, believing that the Inset Reef Light structure was on his starboard bow. In fact it was Piper Reef Light structure that he observed and shortly afterwards the vessel went aground at full speed.

Accurate records of events were not maintained and with only one person on the bridge cross checking of events was not possible.

The Master came to the bridge after the vessel grounded and took over command from the Chief Mate.

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(b) After the grounding

The vessel is Lloyd Register classed Unmanned Machinery Space (U.M.S.) and engine room controls are on the bridge. On reaching the wheelhouse the first action of the Master was to use his engine in the astern propulsion mode and then organise tank, hold, and double bottom tank soundings. This attempt to refloat the vessel was unsuccessful.

Tank soundings were taken at intervals and the depth of water around the vessel just after the grounding was noted.

The draught at the time of grounding varied between the Master's and Chief Mate's statements, between 5.18 Forward and 5.80 Aft to 5.2 Forward and 5.6 Aft.

The Master stated that approximately 60 tonnes of ballast was shifted from No 1 starboard to No 4 starboard and he also put another 40 tonnes of ballast into No 4 starboard wing tank. This had the effect of lightening the bow and lowering the stern.

Although the Master claimed the vessel was only aground on the portside from stem to some 25 metres from the stem, it is clear that this was not the case and damage occurred on both sides of the stem, but more of the vessel on the port side was aground. The following soundings were taken shortly after the vessel went aground.

In Fathoms (1 Fathom = 6 foot = 1.83m)

Over Bow		0.2	
Forecastle Port	0.5	Starboard	3.0
Hatch No 1 Port	2.0	Starboard	3.5
Hatch No 2 Port	4.5	Starboard	4.0
Alt Port	5.5	Starboard	3.5
Over Rudder		8.0	

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At 1600 hours the vessel's engine was placed on slow astern, at 1645 on full astern and by 1700 hours the vessel was off the reef. After sounding of tanks, holds and double bottom tanks had established the hull to have no leaks, the Master continued the voyage to Cairns.

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OBSERVATIONS

1. As no other person was on the bridge prior to the vessel going aground on Piper Reef there is no corroboration of the evidence. The probable time of grounding was between 0705 and 0710.
2. The Chief Mate was unable to provide any credible or logical reason for mistaking Inset Reef light structure for the structure on Piper Reef.
3. Weather conditions did not contribute to the grounding, the weather being fine and clear at the time.
4. No voyage planning for the passage inside the reef had been undertaken.
5. The Chief Mate relied absolutely on radar bearings and ranges to obtain positions. The Gyro compass and both wing repeaters were apparently in good working order but this compass was only used - by him - in conjunction with the auto pilot for steering purposes.
6. The practice of the Chief Mate in using radar bearings and radar ranges to obtain the ship's position is considered to be an unsatisfactory means of establishing the vessel's position, especially so in view of his awareness of the limitations of the radar cursor. On single targets visual bearings supplemented by radar ranges should have been used whenever possible in preference to radar bearings.
7. The Master appeared satisfied to leave the navigation of the vessel, outside his own watchkeeping hours, to the other deck officers unless called by them for assistance.

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8. As the Master attempted but could not obtain Chart AUS 835, which is the most appropriate chart for navigation between Cape Weymouth to Cairncross Islets, it was reasonable to navigate on chart AUS 375 considering the size of the vessel and that the "two-way" route is clearly defined. Had the Chief Mate been concerned about using this chart he should have called the Master and advised him of that concern.
9. The officer of the watch was alone on the bridge during the time leading up to the grounding and no lookouts were posted. No helmsman was on duty or readily available. For the intricate navigation required in this area this is considered to be imprudent.
10. Similarly, whilst the International Maritime Organization Maritime Safety Committee's recommendation states, inter alia, that "ships of over 100 metres ... use the pilotage services provided by the Queensland Coast and Torres Strait Pilot Service" in this area, and therefore is not specifically applicable to "RUCA CHALLENGE": the Master being unfamiliar with the area would have been prudent to have utilized a pilot for the passage through the reef. This is particularly relevant in view of the large scale chart of the area, AUS 835, and the appropriate List of Lights, Volume K, being unavailable on board.
11. The Master stated that he considered taking a pilot but that he was under "orders from the owners . . . . to sail without - [a] pilot if not compulsory."
12. The qualifications held by the Chief Mate, being a British Home Trade Master, a Panamanian Middle Trade Master and a Honduran Coastal Master, would appear to be inappropriate for the deep sea voyage undertaken.

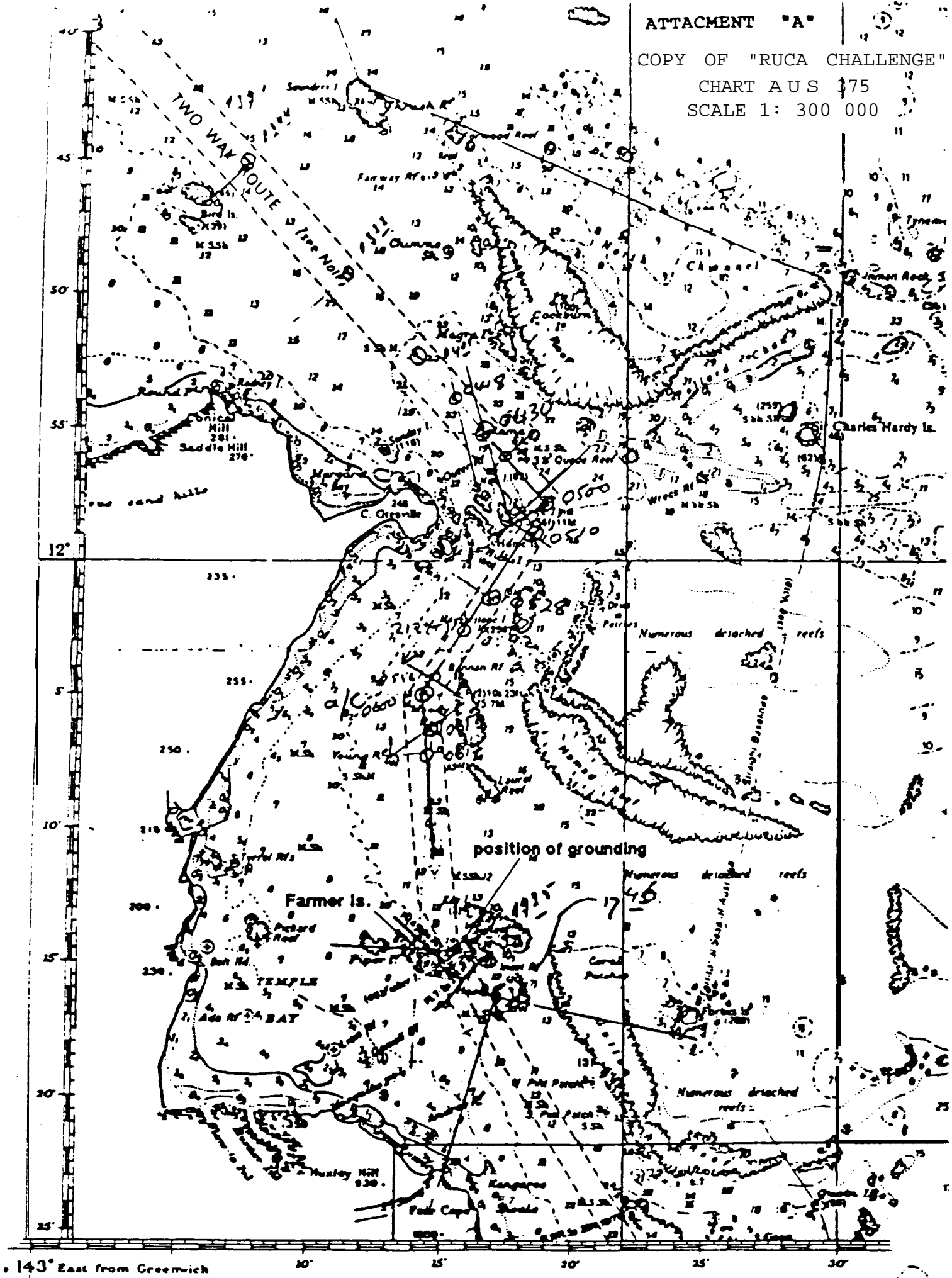
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13. I consider that the Master's permanent night orders located just above the chart table to be clear and concise and covered normal foreseeable circumstances.
14. I found the radar to be in a satisfactory working order. However the electrical centre of the display did not quite coincide with the geometrical centre of the display. Therefore inaccuracies would be present in radar bearings but distance measurement using the variable range marker would probably be accurate.
15. The Chief Mate stated that the light on Inset Reef is not mentioned in the Australia Pilot Vol III (1973) or Supplement 7 (1984). The light was established in 1980 and therefore would not appear in the 1973 Pilot book, but it's omission from the Supplement is noted. However the light is clearly shown on the chart in use at the time of the grounding and both structures and islands would have been clearly visible in the full daylight as the vessel neared the reef.
16. Chart AUS 375 clearly identifies the "Two Way" route and that the safe water is between Piper-and Inset Reefs. Light characteristics and structures may change but the land they are on stays in the same position. The Chief Mate did observe the islands (Fisher and Farmer) but did not use Fisher Island, or any other land feature, clearly identified on AUS 375, for a navigational check.
17. The keeping of sequential records and of Log Book entries was not of a high standard.

CONCLUSIONS

1. I find that the "RUCA CHALLENGE" went aground through errors in navigation in that the Chief Mate failed to correctly establish the vessel's position at regular intervals after 0617 on 21 April.
2. Given the apparently conscientious plotting between 0400 and 0617 I was initially prepared to accept that the Chief Mate did continue to plot the vessel's position after 0617 and that these positions were subsequently erased. However he could give no clear and satisfactory indication of what islands, reefs or light structures he was using for navigational checks and was, as is shown in his statement, very much confused as to what reef was what or where. Therefore, I have to reject his claim that he did continue to properly plot the vessel's position.
3. Given that no plotting of positions was apparently undertaken after 0617 and that the vessel was steering  $170^{\circ}(T)$  to make good a course of  $175^{\circ}$ , the course made good was in fact very close to  $175^{\circ}(T)$  allowing for the actions of the Chief Mate in altering course to starboard for a short period prior to the grounding.
4. Due to confusion in his mind the Chief Mate did not properly establish the vessel's position. He offered no excuses and accepted that the vessel grounded as a result of his errors.
5. No other person directly contributed towards the grounding.

6. The actions taken by the Master in refloating the "RUCA CHALLENGE" were successful. However his initial action in trying to get the vessel off the reef before establishing the seaworthiness of the vessel does not show mature judgement of the circumstances after a grounding, despite being somewhat of a normal reaction.
7. As he was unfamiliar with the passage inside the reef and the lack of a large scale chart of the area, the Master would have been more prudent to have utilized the services of a pilot of the Queensland Coast and Torres Strait Pilot Service.
8. In view of a pilot not being employed, the restricted passage width between Inset and Piper Reefs and the small scale chart in use, a more prudent master may have considered that his presence on the bridge was warranted.
9. Subsequent to the grounding, the Master should have reported the incident to the Federal Department of Transport in accordance with the provisions of section 268 of the (Australian) Navigation Act 1912. This was not done and the Department of Transport's Sea Safety Centre was only advised of the incident when a passing vessel reported the "RUCA CHALLENGE" ashore on Piper Reef.



NOTE: This reproduction is a photocopy of the actual chart in use aboard the "Ruca Challenge". The quality of the reproduction has suffered in the copy process.



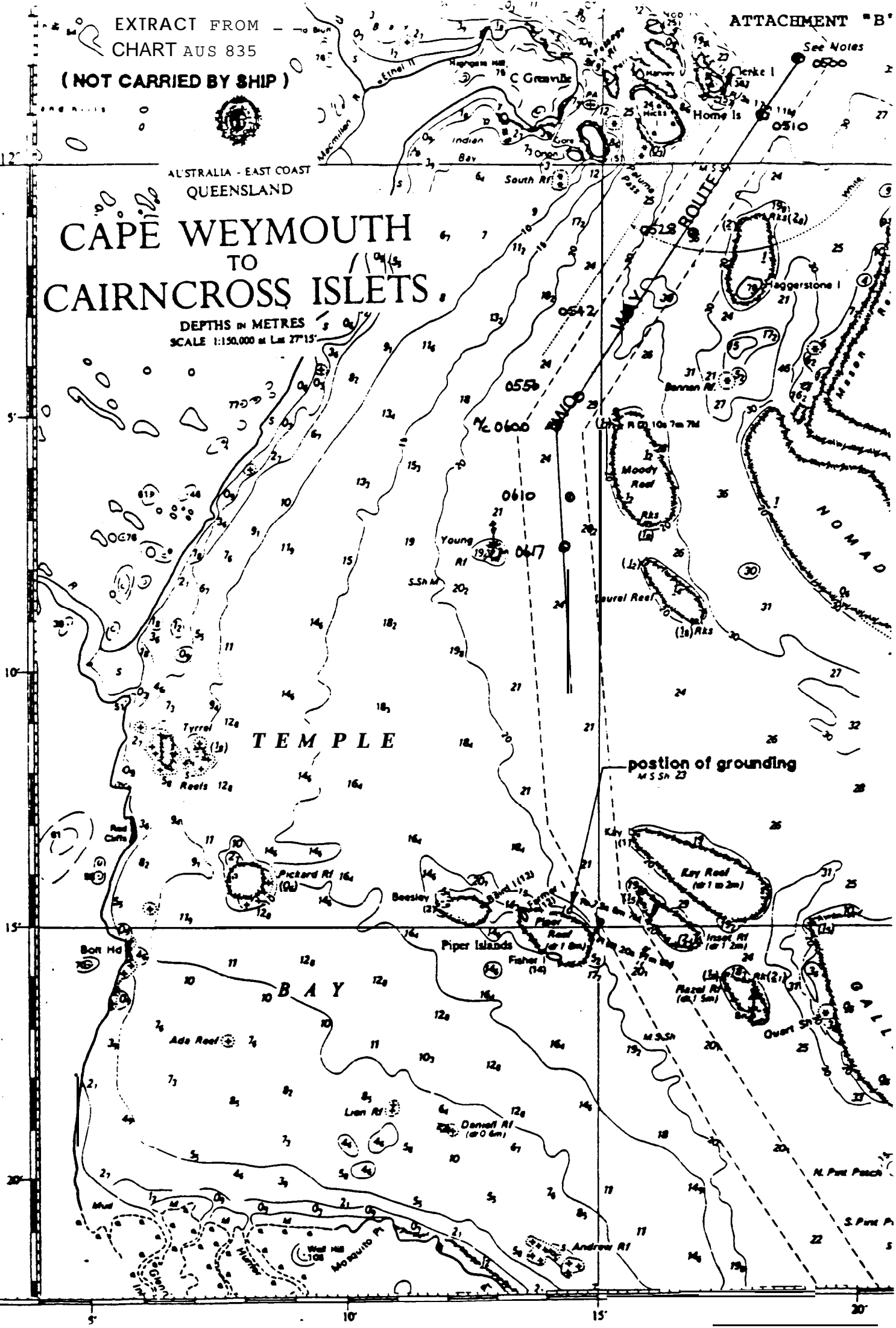
(NOT CARRIED BY SHIP)

See Notes  
0500

AUSTRALIA - EAST COAST  
QUEENSLAND

# CAPE WEYMOUTH TO CAIRNCROSS ISLETS

DEPTHS IN METRES  
SCALE 1:150,000 at Lat 27°15'





REPUBLIC OF CYPRUS

 MINISTRY OF COMMUNICATIONS AND WORKS  
 DEPARTMENT OF MERCHANT SHIPPING

LIMASSOL

## DOCUMENT OF SAFE MANNING

SHIP'S NAME	CALL SIGN	TONNAGE GRT	NATURE OF VESSEL
RUCA CHALLENGE	C4GI	1587	CARGO U.M.S.

This is to certify that, according to the principles and guidelines set out in IMO Resolution A 481 (XII), as the Manning Regulation 84 of the Government of the Republic of Cyprus, the above mentioned ship is considered to be safely manned if, whenever she proceeds at sea, she carries not less than the numbers and grades of personnel shown below.

## DECK DEPARTMENT

Master		Apprentice	
Ch. 3rd	ONE	Boatswain	ONE
Deck Officer	ONE	A.B.	THREE
R'O		O.S.	---
<b>Skipper</b>	---		---

## ENGINE DEPARTMENT

Ch. Eng.	---	Motorman	ONE
2nd Eng.	---	Oiler	ONE
Engineer Officer	ONE	Fireman	---
Apprentice	---	Wiper	---
		Pumpman	---

## STEWARD DEPARTMENT

Cook	ONE	Messboy	---
Steward	---		

TOTAL CREW	TEN
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Issued on ..... 27/6/1986

at Piraeus

at .. ..

  
 Director  
 Department of Merchant Shipping

(Name of shipping line, agent, etc.)

**CREW LIST**

**REPUBLIC ARRIFF S**

Page No.

Arrival

Departure

1. Name of ship <b>"RUJA CHALLENGER"</b>			2. Part of arrival / departure		3. Date of arrival / departure	
4. Nationality of ship <b>BRITISH</b>			5. Port of arrival from			6. Nature and No. of Identity document (seaman's passport)
7. No.	8. Family name; given names	9. Rank or rating	10. Nationality	11. Date and place of birth		
1	<b>BLOKJL JACOB</b>	<b>MASTER</b>	<b>DUTCH</b>	<b>24/1/51 ROTTERDAM</b>		<b>R 176690</b>
2	<b>KELLER DONALD MATHEW</b>	<b>O/OFF</b>	<b>U.K.</b>	<b>27/9/43 EDMONTON</b>		<b>R 188156</b>
3	<b>KOHLER BERHARD E.A.</b>	<b>O/OFF</b>	<b>W. GERMANY</b>	<b>24/3/20 HAMBURG</b>		<b>908</b>
4	<b>SEKARFO</b>	<b>ENG/OFF</b>	<b>INDONESIAN</b>	<b>7/2/45 KEBONDEN</b>		<b>A 315784</b>
5	<b>MAHSE FRED</b>	<b>MOTORMAN</b>	<b>DUTCH</b>	<b>22/7/54 ZUIDERBEEK</b>		<b>B 767997</b>
6	<b>NIEBOER HEYZER TIPPO</b>	<b>COOK</b>	<b>DUTCH</b>	<b>23/5/42 GRONINGEN</b>		<b>D 230098</b>
7	<b>NEVES ANTONIO MONTEIRA</b>	<b>B. SWAIN</b>	<b>PORTUGES</b>	<b>17/3/52 PORTUGES SAN ANTONIO</b>		<b>R 167583</b>
8	<b>LOPEZ JOAO M</b>	<b>A, B</b>	<b>PORTUGES</b>	<b>30/5/52 G. VERDE</b>		<b>B 93302</b>
9	<b>dos SANTOS MANUEL JOAO</b>	<b>A, B</b>	<b>PORTUGES</b>	<b>17/II/30 R. GRANDE</b>		<b>R 17951</b>
10	<b>ALVES MANUEL JOSE</b>	<b>A, B</b>	<b>PORTUGES</b>	<b>25/3/48 S. CRUSIFIEDO</b>		<b>R 167156</b>

*[Handwritten signature]*