REPORT OF THE PRELIMINARY INVESTIGATION

INTO THE CIRCUMSTANCES OF THE COLLISION BETWEEN

THE M.V. LYSAGHT ENDEAVOUR AND THE YACHT GRUNTER

IN APPROXIMATE POSITION 35° 02' SOUTH 150° 52' EAST

OFF BEECROFT HEAD NSW

ON 16 DECEMBER 1985

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OUTLINE OF INCIDENT

At about 2205 hours Eastern Australian Standard Summer Time on 16 December 1985, the Australian flag roll-on roll-off cargo ship LYSAGHT ENDEAVOUR, of 7591 tonnes gross, on passage from Fremantle to Port Kembla in ballast, was in collision with the Australian yacht GRUNTER, of 10 metres in length, which was bound from Botany Bay NSW to Lakes Entrance in Victoria.

The collision occurred off Beecroft Head near Jervis Bay NSW, in approximate position 35° 02'S 150°52'E (see Attachment 1). No person was injured and GRUNTER, although slightly damaged, did not require assistance.

LYSAGHT ENDEAVOUR resumed the passage to Port Kembla after establishing that GRUNTER did not require assistance. GRUNTER returned to Botany Bay for repairs via Kiama.

AUTHORITY TO CONDUCT INVESTIGATION

On 20 December 1985 John Michael Quinlan, an officer of the Federal Department of Transport, was appointed under Section 377 of the Navigation Act 1912 to make a Preliminary Investigation into the circumstances of the collision between the motor ship LYSAGHT ENDEAVOUR and the yacht GRUNTER in the vicinity of Latitude 35 degrees 02 minutes South, Longitude 150 degrees 52 minutes East on 16 December 1985. (See Attachment 2).

PERSONS INTERVIEWED

The following persons were interviewed between 9 January and 16 January 1986:

Captain G.D. Shearn	Master, LYSAGHT ENDEAVOUR
Mr. I.L. Williams	Fourth Mate, LYSAGHT ENDEAVOUR
Mr. B. Collins	Lookout, LYSAGHT ENDEAVOUR
Mr. D. Griffith	Skipper, GRUNTER
Mr. M. Mitchell	Helmsman, GRUNTER

Further questions, as shown in the records of interviews, were put to Mr. Griffith and Mr. Collins by telephone in the light of further information obtained subsequent to their interviews.

BASIS OF INVESTIGATION

The yacht GRUNTER was inspected on 17 January 1986 at Botany Bay, where it was awaiting repairs. LYSAGHT ENDEAVOUR was inspected at Port Kembla on 21 January 1986, on the following voyage. Colour and visibility tests were carried out on the tricoloured navigation light from GRUNTER. Mr. Williams and Mr. Collins agreed to undertake Departmental colour and form vision tests.

The following report is based on the above interviews, inspections and tests and on log book and other documentary records.

All times are Eastern Australian Standard Summer Time and distances are in nautical miles, except where specified otherwise.

DETAILS OF VESSELS

LYSAGHT ENDEAVOUR

OFFICIAL NUMBER	355461
HOME PORT	Melbourne
OWNERS	Australian Shipping Commission
TYPE	Roll on-roll off cargo
CONSTRUCTION	Steel welded
BUILT	1973 Newcastle NSW, lengthened Ulsan Korea 1980
TONNAGE	Gross 7591.22 tonnes Net 3424.31 tonnes Deadweight 11,999 tonnes
REGISTERED DIMENSIONS	L 160.09m B 22.58m D 14.78m
PROPULSION	Single screw, controllable pitch
MACHINERY	Two 8 cylinder Kawasaki diesels 11769 kW
SPEED	18 knots (maximum)
CLASS	Lloyds + 100A1 + LMC UMS
LOAD LINE CERTIFICATE	Issued by Lloyds 3 April 1984. Valid to 12 September 1988. Last annual inspection 9/85.
SAFETY EQUIPMENT CERTIFICATE	Issued by DOT Australia 15 June 1984. Valid to 24 May 1986. Annual survey 11 June 1985.

SAFETY RADIOTELEGRAPHY CERTIFICATE	Issued by DOT Australia 13 June 1985. Valid to 28 May 1986.
SAFETY CONSTRUCTION CERTIFICATE	Issued by Lloyds 29 March 1984. Valid to 12 September 1988. Annual survey 9/85.
NAVIGATION EQUIPMENT	Standard magnetic compass reflected to steering position; master gyro compass repeated to bridge wings, wheelhouse top, auto pilot, course recorder, off course alarm, two 3 cm radars, radio direction finder and satellite navigator; echo sounder; VHF radiotelephone; bridge control of main engines (unmanned machinery space operation - UMS).
LOOKOUT	There are no significant obstructions to visibility from the navigation bridge or the lookout position on the wheelhouse top.

GRUNTER

CALL SIGN	VK3269
SAIL NUMBER	SM 369
REGISTERED	Sandringham (Vic) Yacht Club (not registered as an Australian ship)
BASE PORT	Metung Victoria
OWNERS	David Griffith, John Hancock and Andrew Allsepp - all of Melbourne.
TYPE	Sailing yacht, Freedom 33, cat rigged ketch, unstayed carbon fibre masts.
CONSTRUCTION	Fibreglass

BUILT	Hull USA 1980, fitted out Melbourne 1980/81.
LENGTH	10 metres
ENGINE/PROPULSION	Auxiliary diesel, single screw.
SPEED	7 knots approx.
CERTIFICATES	Safety Equipment Compliance List certifying compliance with Australian Yachting Federation safety requirements for Category 2 races when the yacht was checked on 14 December 1984. Checks are normally made annually at the beginning of each race season in Spring and are required for racing only. Category 2 races cover extended distances along the coastline not far from shore. If the equipment on GRUNTER still complied with the Safety Equipment Compliance List checked in 1984 it would have been satisfactory for the voyage from Botany Bay to Lakes Entrance.

SEQUENCE OF EVENTS

LYSAGHT ENDEAVOUR sailed from Fremantle on 11 December 1985 in ballast for Port Kembla with its normal complement of 36 crew, all properly certificated as required. Draughts were 4.34m forward and 5.87m aft. The ship followed a close inshore track up the east coast to avoid the southerly current as far as practicable.

At 2000 hours on 16 December 1985, when off the NSW coast, the fourth mate, Ian Williams, took over the 8 to 12 evening watch on the navigation bridge from the second mate, James Martin. At the same time, able seaman Bernard Collins took up lookout duty in the cab on the wheelhouse top. The fourth mate satisfied himself that the lookout was fit for duty. Although he did not give the lookout any instructions at the time, he stated that he had done so on previous occasions. The watch consisted of the officer of the watch and lookout, which is normal for the ship. Ian Williams had a Second Mate Class 1 Certificate and eighteen months watchkeeping service and the lookout had been an able seaman for about twenty nine years.

Navigation lights were switched on at sunset, the ship was in automatic steering with off course alarm engaged and the 3cm radar on the port side of the wheelhouse was in operation. The ship was in UMS mode (unmanned machinery space), with bridge control of main engines. There were apparently no lights or obstructions which would interfere with the keeping of a proper lookout. Visibility was good, although there were some occasional showers of rain to seaward. In the previous watch, the wind had been NExN force 5/6 with a rough sea and moderate NNE swell, but the wind and sea were moderating gradually.

At 2020 hours with Brush Island light bearing 275° (T), 4.6 miles off, course was altered to 041° (T) to pass Point Perpendicular light 2.4 miles off. About 2140 hours the master, Captain Shearn, came to the bridge and laid off courses to pass between Little Beecroft Head and Sir John Young Banks.

At 2143 hours with Point Perpendicular light bearing 295° (T), 2.8 miles off, course was altered to North (T), to pass inside the Banks. The master then told the fourth mate that he was going below to his cabin and would return later, but asked to be called if the fourth mate was in any doubt or needed

assistance. The master also asked whether the fourth mate was satisfied with the course and happy to pass inside the Banks. The fourth mate answered in the affirmative and the master went below. Visibility was still good and the wind had eased to NNE Force 4.

About 2155 hours, the fourth mate stated that he was just inside the port wheelhouse door when he sighted, with the naked eye, a white light about one point (11 1/4°) on the port bow. He stated that he examined it more closely with binoculars and noted it was a steady white light, fairly strong using binoculars, yet readily visible without them. He took a bearing of the light on sighting it, using the port bridge wing gyro repeater, and then the lookout reported a steady white light about a point on the port bow. He stated it was a definite white light, without any tinge of discolouration.

The fourth mate had been observing the radar at frequent intervals, using range scales 3, 6, 12 and 24 miles. There was moderate wave clutter on the screen and although he adjusted the anti-clutter control, he was unable to find a radar target in the direction of the white light just sighted. Apart from that white light and a radar target over twelve miles away, there was no indication of other vessels in the vicinity.

The yacht GRUNTER had cleared Botany Bay about 1500 hours on 16 December 1985, for Lakes Entrance in Victoria. There were four persons on board:

David Griffith	Skipper and joint owner, age 44, no marine qualifications, but stated that he had attended navigation courses and had made about twenty coastal yachting voyages in the last twenty years.
Michael Mitchell	No marine qualifications, but stated that he had made several yachting coastal voyages in the last five or six years.
David Rogers and Roger May	No marine qualifications and reported to have little or no ocean yachting experience.

Michael Mitchell took over the steering on GRUNTER at about 2100 hours, the course being 170° by cockpit magnetic compass, which would have been 183° (T) allowing 13° East variation. As the yacht was of fibreglass construction with no apparent magnetic influence near the pedestal cockpit compass, it can be accepted that there were no significant deviations. The wind was estimated as northeast force 5 and the yacht was yawing about 5° either side of 183° (T). Speed was six to seven knots under foresail only and the auxiliary motor was not in use. According to the skipper, the night was very dark with no moon, but they could see Point Perpendicular light when they were off Beecroft Head. The weather was fine, but there had been rain and hail showers earlier and the two hatches in the cabin top were closed. Navigation lights were switched on at dusk and were said to consist of a tricoloured port/starboard/stern lantern on the top of the foremast and a second stern light aft on the transom. The faint glow of a small white shaded light over the chart desk could be seen from the cockpit through the companionway to the cabin. A radar reflector was carried on the yacht, but was not hoisted.

At about 2145 hours, off Beecroft Head, the helmsman on GRUNTER, Michael Mitchell, saw the lights of an approaching ship fine on the port bow and called the skipper from the cabin. The skipper assessed the situation, determined the vessels would pass clear of each other and told the helmsman to maintain the course.

At 2200 hours on LYSAGHT ENDEAVOUR, the fourth officer fixed the ship's position by radar off the Drum and Drumsticks, slightly to seaward of the course line on the chart. He then checked the relative bearing of the white light on the port bow and considered that there had been no change. He checked the radar and did not see any echo in the direction of the white light. He realised that it was a small vessel, as it was not showing a radar echo. As he considered that the bearing was not changing he took the white light to be the stern light of a vessel northbound, but converging on a course more to seaward than LYSAGHT ENDEAVOUR. He elected to take avoiding action by a large alteration of course to port, to pass under what he took to be the other vessel's stern.

The course recorder trace shows that at 2201 l/2 LYSAGHT ENDEAVOUR altered course 40° to port to 320° (T) and then altered back again over a period of 2 minutes, until at 2204½ it was back on the original course of North (T), with the white light fine on the starboard bow. The fourth officer carried out the course alterations in hand steering and the lookout was still on the wheelhouse top.

Immediately on resuming the course of North (T), the fourth officer realised the white light was a lot closer than he had expected. Within a few seconds of steadying up on North (T), he caught a brief glimpse of a green light which appeared to be just under the white light. At this point, he noticed the reflection of white light on a sail and realised it was a yacht disappearing under the starboard bow. He immediately altered course to starboard to 050° (T), in order to throw the stern clear of the yacht and phoned the master. The course recorder trace shows that less than thirty seconds elapsed from the time the ship returned to the North (T) course at 2204 l/2 and the commencement of the alteration to 050° (T).

Meanwhile, on the wheelhouse top, the lookout noticed the alteration of course to port at 2201 l/2 and observed the white light getting closer. He then saw the white light practically ahead and very shortly before collision he noticed it change to green although, because it all happened so quickly, he could not be sure whether or not the white and green were both visible together. Within a few seconds of sighting the green light, it disappeared under the starboard bow and he heard a crash. He went to the starboard side of the wheelhouse top and saw the outline of a hull and masts scraping past the ship showing no lights. He then went down to the navigation bridge to report the collision to the fourth officer, who was on the telephone reporting it to the master.

On the yacht GRUNTER, the mean course of 183° (T) was maintained after sighting the ship's lights. Michael Mitchell was still on the wheel when he noticed the ship alter course to port towards the land. He directed the attention of the skipper, who was still in the cockpit, to this manoeuvre.

Apparently neither person appreciated that the ship had gradually altered to starboard to resume its northerly course soon after the sharp alteration to port. However, they realised the ship was getting very close and at the last

minute the yacht altered course to port to try to avoid a collision. Then collision seemed inevitable and the yacht turned around hard to starboard, to lessen the impact by running in the same direction as the ship.

Collision occurred at 2205 hours, when LYSAGHT ENDEAVOUR was steering North (T) at fifteen knots and GRUNTER was heading about 330° (T) with little headway, after two large alterations of course in quick succession. No sound signals were made by either vessel. The point of impact was reported by the skipper of the yacht to be about 20 yards abaft the starboard bow of LYSAGHT ENDEAVOUR. Absence of heavy damage to the yacht indicates that impact was probably in the parallel body of the ship where the master of LYSAGHT ENDEAVOUR reported marks on the ship's side about 60 metres from the bow. GRUNTER's foremast top contacted the ship's side, breaking off the masthead cap fitting, to which was bolted the tricoloured lantern. The foresail halyard lead through a block shackled under the cap fitting. Cap fitting, navigation lantern and foresail dropped together to the deck.

The master came to the bridge of LYSAGHT ENDEAVOUR immediately on being called by telephone by the fourth officer, who told him he thought they had hit a yacht. The lookout was now on the wheel and the master took over control, ordering a turn to starboard to look for the yacht. Engines were put on standby and speed reduced and the first mate, radio officer and extra lookouts were called to the bridge. Maritime Services Board Port Control Sydney and the Sea Safety Centre Canberra were alerted to the situation. The yacht was soon located visually, with the aid of overside floodlights. It could not be detected on radar, then or at any time later. Voice contact was established and the crew of GRUNTER stated that there were four persons on board and no injuries, the yacht was not taking water, the radio was out of action, the boom was broken and they had limited steering. However, the master and fourth officer did not notice any steering problems on the yacht as it manoeuvred in the vicinity under motor. They also noted that the yacht was showing no lights apart from a light in the cabin. The crew of the yacht advised that they were proceeding to Kiama and declined an offer of assistance from LYSAGHT ENDEAVOUR. The Sea Safety Centre was advised by LYSAGHT ENDEAVOUR, about 2245 hours, that the yacht was safely on its way to Kiama with no injuries to crew. LYSAGHT ENDEAVOUR then resumed its voyage.

LYSAGHT ENDEAVOUR was heading seawards after seeing the yacht safely on its way north and the master decided to continue that way and pass outside Sir John Young Banks. He stated that he did not consider it prudent to use the narrow inside passage, until his night vision recovered after the use of the floodlights. The ship berthed at Port Kembla at 0206 hours the next morning.

GRUNTER arrived safely in Kiama about 0330 hours on 17 December, despite some steering difficulties. It was found there that a broken rudder gudgeon was the cause of the steering problems encountered after the collision. Other damage was assessed as a broken mast fitting, damaged port toe rail capping and some bent side rail stanchions. The yacht returned to Botany Bay later that day for repair.

INSPECTIONS & TESTS - RESULTS

The fourth officer and lookout on LYSAGHT ENDEAVOUR, Ian Williams and Bernard Collins, voluntarily agreed to being given Departmental sight test on 16 and 23 January 1986 respectively. The tests were carried out in accordance with the standards and procedures set out in Appendix 2 of Marine Orders Part 9 (Health - Medical Fitness). Both persons passed the lantern colour and letter tests, without aids to vision and both were found to have 6/6 vision in each eye, a higher standard than the minimum prescribed for service in the deck department of Australian ships. Ian Williams passed the N-5 chart, without aids to vision. Bernard Collins used spectacles to pass the N-5 chart, but this is permitted and is not considered of any significance as far as ability to keep a proper lookout is concerned.

On 17 January 1986, the yacht GRUNTER was inspected at Botany Bay, where it was awaiting repairs. Damage reported by the skipper in his interview was verified, as were the particulars of the yacht on page 5 of this report. The fibreglass construction of the yacht indicated that it would be a poor radar target. The steering compass was located on a pedestal in the cockpit where no significant deviations could be expected. An unusual feature of this ketch was the unstayed carbon fibre masts, each of which supported one sail only. The rig was very similar to a sailboard or windsurfer with a wishbone type boom around the mast. The sails were hoisted by a halyard led through a block on the underside of the mast cap fitting. Access to the navigation light on top of the foremast cap appeared possible only by bosun's chair or by removing the mast with a crane. However further investigation showed this not to be so.

The mast cap fitting and tricoloured lantern from GRUNTER's foremast was not located in the repair boat shed until 21 February. The red port sidelight glass was found to be very faded - it varied from almost white in the centre area to light pink around the edges. A white all round anchor light, broken in the collision, was fixed to the top of the tricoloured lantern. The lantern was tested and it was noted that only the starboard sidelight was operating.

The lantern was secured to the mast cap with a stainless steel bolt down through the top of the lantern, with a nut underneath the mast cap. The aluminium cap had been welded to a sleeve inserted in the hollow mast so that the lantern securing nut was inside the mast. As the only halyard blocks on the mast were attached to the cap fitting, it would have been impossible to remove the lantern from the cap from a bosun's chair. Access for routine lamp replacement was possible only by removing the lantern from the cap. Great difficulty was experienced in doing this in the Department's navigation aids workshop and eventually the head of the securing bolt had to be cut off.

It was found that the lantern was divided internally into three separate sectors, with one 12 volt 3 watt festoon type lamp in each. The filaments in the port and stern sectors were broken either by a heavy physical shock or by fatigue through age. The skipper stated that the lantern was fitted in 1981, when the yacht was built. He did not know if the lamps had been changed at all since then. From the inspection, it appeared that they had not in fact been changed. This type of lamp has a life of about 200 hours and according to the skipper's statement about usage, the lamps may have been close to or past their normal life span at the time of the collision. The starboard lamp filament certainly survived the fall from the mast top, which was probably cushioned by bunching of the sail around the mast in the lower part of the fall.

New 12 volt 3 watt festoon type lamps were inserted in the lantern and I carried out tests in darkness, in good visibility, over water on Lake Macquarie, to establish the range of visibility and colour of the lights. Whilst such tests and resulting comparisons are necessarily subjective in a number of respects, I underwent a sight test in accordance with Appendix 2 of Marine Orders Part 9 (Health-Medical Fitness) on 5 March 1986. I passed the colour test and have 6/9 unaided vision in each eye.

Thorough tests were carried out over known distances of 2.0, 1.3 and 0.1 nautical miles. At each of the three ranges, with and without binoculars, the port sidelight appeared to me to be white instead of red. At 0.1 mile the port sidelight showed as white with a yellowish tinge.

The minimum range of visibility of navigation lights required by Marine Orders, Part 30 (Prevention of Collisions) for a vessel of GRUNTER's length, (10 metres), is one mile for the sidelights and two miles for the sternlight. In the test at 2.0 miles range the port light, showing as white, was barely discernible to the naked eye, even though I knew where to look for it. I would estimate its maximum range to a person of 6/6 vision, compared with my 6/9, as about two and a half miles. The white sternlight was somewhat brighter, with a estimated maximum range for 6/6 vision of about three miles.

The inspection on GRUNTER also revealed that the sternlight on the transom was not operating. An attempt was made to open up the light to check the lamp, but this was not possible because of a seized screw with a burred head.

COMMENTS ON INFORMATION PROVIDED

1. The fourth officer estimated that the white light was sighted about 2155 hours, whereas the lookout estimated it as between 2150 hours and 2155 hours. It is considered that the fourth officer's estimate is probably the more reliable as he would have been more aware of the time, having just recently plotted the ships position, and it has been used in the reconstruction of the collision in the diagram in Attachment 4.

2. There is degree of discrepancy between the fourth officer and the lookout about the sighting of the green light, as to whether the white and green were seen together. As the green light was seen for less than half a minute, probably considerably less, any discrepancy is understandable in the circumstances.

3. The major discrepancy in the statements provided is that, being on almost opposite courses and each sighting the other on the port bow, GRUNTER should have been showing a red port sidelight towards LYSAGHT ENDEAVOUR. The skipper and helmsman on GRUNTER maintain the port sidelight was operating, yet the fourth officer and lookout on LYSAGHT ENDEAVOUR are positive they saw a white light. Tests on the yacht's port sidelight clearly demonstrated that the lens was so faded that the light appeared white, at all relevant ranges. The diagram in Attachment 4 assumes that the white light was first sighted at 2155 hours about 3.5 miles off. Even if the light was not sighted until 2157 hours, the range would have been 2.8 miles, which is beyond the maximum range of the port sidelight indicated in the tests. The fourth officer's statement that he had a brief glimpse of the green sidelight close under the white light just before they disappeared, could indicate that the source of the white light was the all round white anchor light on top of the tricoloured lantern. However, the skipper and the helmsman of the yacht maintain that the anchor light was not switched on. It could be inferred that the anchor light had been switched on because the port sidelight and both sternlights were not operating. Whichever of the alternatives is correct, there is little doubt that a white light, instead of a red

port sidelight, was sighted by the officer of the watch and the lookout on LYSAGHT ENDEAVOUR. The white light could not have been the cabin lights, as the hatches in the cabin were closed and the cabin windows are small. It is considered that, even if the hatches were open, any light would have been indirect and too weak to be sighted on the ship except at very close range.

4. The diagram in Attachment 4 indicates the bearing of the yacht was 4° on the port bow at 2155 hours and 12° on that bow at 2201½. This conflicts with the statement of the fourth officer and lookout that the white light was first sighted about a point on the port bow and the fourth officer's statement that there was no change in the bearing between 2155 hours and the time he altered course to port at 2201½. However the term "point" is only an approximation and there is a possibility that the yacht's track was not 183° (T) but about 180° (T). The helmsman stated that the yacht was yawing about 10° and with the wind and sea on the port quarter it is possible that the yacht was yawing more to port of the compass course.

5. The skipper of the yacht said that he could see Point Perpendicular light when off Beecroft Head. The chart shows that the light should be obscured in that area. He was questioned as to whether it was the loom of the light he saw, but he didn't appear to understand and the matter was not considered of sufficient importance to pursue. The location of the collision is considered to be clearly evident from the chart and from course alterations on the course recorder trace (See Attachments 1 and 3).

6. The course recorder trace shows a sharp alteration of course to port to 320° at 2201½ followed by a slower swing back to starboard until the northerly course was resumed at 2204½. This was followed almost immediately by a swing to starboard to 050°, when the collision occurred. The trace confirms the statement from the fourth officer. In the diagram on Attachment 4, the curved track of LYSAGHT ENDEAVOUR between 2201½ and 2204½ is derived from a more detailed plot of the course alterations indicated by the recorder trace. The plot showed a lateral transfer of 0.27 miles from the original track and an advance of 0.71 miles along the projection of that track.

CONCLUSIONS

Note: In these conclusions the rules referred to are those in the International Regulations for Preventing Collisions at Sea, 1972, Appendix 1 Marine Orders Part 30 (Prevention of Collisions).

I find that:

1. The collision was caused by a chain of events consisting of several interdependent major factors, the absence of one or more of which would have made the collision extremely unlikely. In chronological order these factors were:

(a) The yacht GRUNTER, in contravention of Rule 25, did not exhibit "sidelights" as defined in Rule 21, namely "a red light on the port side".

(b) On LYSAGHT ENDEAVOUR, in contravention of provision 4.1 of Marine Orders Part 28 (Operations Standards and Procedures), the composition of the navigation watch was not adequate and appropriate, taking into account:

. the ship was in automatic steering with no standby helmsman close at hand

. the ship was close to shore approaching a narrow unlit passage inside Sir John Young Banks in darkness at full speed and the officer of the watch, in addition to being required to fix the ship's position at frequent intervals and keep it on the intended track, would be required to undertake helmsman's duties if avoiding action was required.

(c) (i) LYSAGHT ENDEAVOUR altered course to port at about 2201 hours on the incorrect assumption that the white light sighted was the stern light of a vessel. The light could have been the white

light prescribed in Rule 23(c)(ii) or Rule 25(d) or Rule 30(b). As it eventuated, it was not a prescribed light but a sailing vessel underway showing a white light on its port side.

(ii) LYSAGHT ENDEAVOUR'S resumption of its Northerly course at 2204½ hours did not result in a safe passing distance from the other vessel as required by rule 8(d). Rather, when combined with the previous factors, it was the culmination of the events which caused the vessels to collide.

2. Failure of GRUNTER to display its radar reflector was a lesser factor in the collision. Had it been displayed it may have been detected by LYSAGHT ENDEAVOUR'S radar and, if so, collision probably would not have occurred. There is no specific requirement in the Rules to display a radar reflector. However the yacht, being of fibreglass construction, was a poor radar target and display of the radar reflector carried on board could be considered "required by the ordinary practice of seamen, or by the special cicumstances of the case" under rule 2(a).

3. No sound signals were made by LYSAGHT ENDEAVOUR to indicate manoeuvres in accordance with Rule '34. Such signals given as required on the initial alteration of course at 2201 hours may have assisted those on the other vessel.

4. LYSAGHT ENDEAVOUR was properly manned and equipped and was seaworthy for the voyage.

5. GRUNTER could be considered unseaworthy in terms of Section 207 of the Navigation Act 1912 in that the lack of a port sidelight rendered it unfit to encounter an ordinary peril of the voyage, namely collision risk.

6. The master of LYSAGHT ENDEAVOUR took appropriate measures after the collision to establish that GRUNTER was not in danger and did not require assistance.

DETAILED CONCLUSIONS

Actions of Fourth Officer of LYSAGHT ENDEAVOUR

The fourth officer's decision to take avoiding action at 2201½ hours was based on his opinion that there was no significant alteration in the bearing of the white light since he first sighted it. However, in electing to alter course to port his decision was based on the incorrect assumption that the white light was a sternlight. Had the other alternative explanations for a single white light been considered there would, naturally, have been a state of uncertainty in his mind. In that situation the prudent course of action would have been to call the master (4.4.2(c) of Marine Orders Part 28) and make a bold alteration of course to starboard towards the open water seawards.

The addition of the master to the bridge team would have brought it up to proper strength in the circumstances and there would also have been sufficient time to resolve the state of uncertainty about the white light. It must be taken into consideration that, despite his own agreement, the master had left the fourth officer in charge of a watch that was under-manned in the prevailing circumstances. He was acting under pressure in a situation that was developing faster than he was able to appreciate. Had he been able to observe the white light more carefully, instead of having to take the wheel to make course alterations during the three and a half minutes immediately before collision, he may have appreciated earlier that the light was much closer than expected. This may have given him time for effective avoiding action.

Actions of Master of LYSAGHT ENDEAVOUR

When the master left the bridge at about 2145 hours, intending to return when the vessel came into the vicinity of Beecroft Head, he had placed the ship on a course roughly parallel to the shoreline and about one mile off it. The ship was being committed to negotiating a narrow unlit passage in darkness, although the visibility was good and the radar operational.

Chapter 11.72 of Australia Pilot Volume II states:

> "A channel leads between the SW end of Sir John Young Banks and Beecroft Head with depths of 40m (22 fm) in it; but the vicinity of these banks should be avoided as the current, when strong, causes a rip which has been seen to break even in smooth water."

This note does not directly state the channel should be avoided but rather that the vicinity of the banks should be avoided by vessels likely to be troubled by breaking water. LYSAGHT ENDEAVOUR is well found, equipped, manned and powered, and having direct bridge control of main engines should, in reasonable weather and visibility, have had no problems in negotiating the channel at night.

Although it was not unreasonable for the master to commit his ship to the passage inside Sir John Young Banks, there is no doubt that it involved a significantly higher degree of navigational hazard than normal. For that reason, he should have upgraded the composition of the navigational watch from 2145 hours, by either remaining on the bridge himself or by having, in addition to the rating lookout, a helmsman on standby in the wheelhouse.

The failure of the master to upgrade the composition of the watch, placed the fourth officer in the position where, with the ship in automatic steering and a potentially dangerous situation developing quickly, he was without assistance and had to break the continuity of his lookout by taking the wheel for avoiding action. This is considered to contravene:

> 4.1 of Marine Orders, Part 28 (Operations Standards and Procedures)
>
> Regulation 19 of Chapter V of the International Convention for Safety of Life at Sea 1974

and led to the inability of the fourth officer to follow:

> Paragraph 11 of Resolution 1, Attachment 2 to the International Conference on Training and Certification of Seafarers 1978.

4.1.2 of Marine Orders, Part 28 states:

"Determination of the composition of a navigational watch on the bridge, which may include appropriately competent deck ratings, shall take account inter alia, of the following factors:

(a) weather conditions, visibility and whether there is daylight or darkness;

(b) the proximity of navigational hazards which may necessitate the officer in charge of the watch carrying out additional navigational duties;

(c) the use and operational condition of navigational aids including radar or electronic position-indicating devices and any other equipment affecting the safe navigation of the ship;

(d) whether the ship is fitted with automatic steering; and

(e) any unusual demands on the watch that may arise as a result of special operational circumstances."

Regulation 19 of Chapter V of the International Convention for Safety of Life at Sea states:

"(a) In areas of high traffic density, in conditions of restricted visibility and in all other hazardous navigational situations where the automatic pilot is used, it shall be possible to establish human control of the ship's steering immediately.

(b) In circumstances as above, it shall be possible for the officer of the watch to have available without delay the services of a qualified helmsman who shall be ready at all times to take over steering control.

(c) The change-over from automatic to manual steering and vice versa

shall be made by or under the supervision of a responsible officer."

Paragraph 11 of Resolution 1, Attachment 2 to the International Conference on Training and Certification of Seafarers states:

> "The officer of the watch should bear in mind the necessity to comply at all times with the requirements of Regulation 19, Chapter V of the International Convention for the Safety of Life at Sea, 1974. He should take into account the need to station the helmsman and to put the steering into manual control in good time to allow any potentially hazardous situation to be dealt with in a safe manner. With a ship under automatic steering it is highly dangerous to allow a situation to develop to the point where the officer of the watch is without assistance and has to break the continuity of the look-out in order to take emergency action. The change-over from automatic to manual steering and vice versa should be made by, or under the supervision of, a responsible officer." (underlining mine).

Actions of the Skipper of GRUNTER

The source of the white light sighted by LYSAGHT ENDEAVOUR, may have been the port sidelight showing white or the all round anchor light on top of the lantern. The skipper and helmsman of GRUNTER however, denied that the anchor light was on. However, there is little doubt that GRUNTER did not exhibit a proper red port sidelight.

Seen from very close range, eg. from the deck, the port sidelight appears pink rather than white as it appears at longer ranges. The skipper could have become accustomed to the gradual fading of the lens over a number of years and not have fully realised the significance of it.

Although he did not take avoiding action by altering course to port until collision was almost inevitable, this is considered a very minor breach of Rule 17 (Action by Stand-on Vessel). It would have been very difficult for him to determine the point at which collision could not be avoided by the action of the give-way vessel alone. In the final event, his quick

manoeuvring immediately prior to the impact does appear to have lessened its effect.

Failure to exhibit the radar reflector carried on the yacht could be considered to be neglect of a precaution required by the ordinary practice of seamen (Rule 2). The radar reflector would have increased the possibility of the yacht being detected by radar, in view of yacht being of fibreglass construction. Failure to exhibit the radar reflector could therefore be said to have contributed to the events leading up the collision.

Responsibility of the Owners of LYSAGHT ENDEAVOUR

The Australian National Line Navigation and Bridge Organisation Manual incorporates the basic requirements of Regulation II/1 of Attachment 1 and Resolution 1 of Attachment 2 to the International Conference on Training and Certification of Seafarers, 1978.

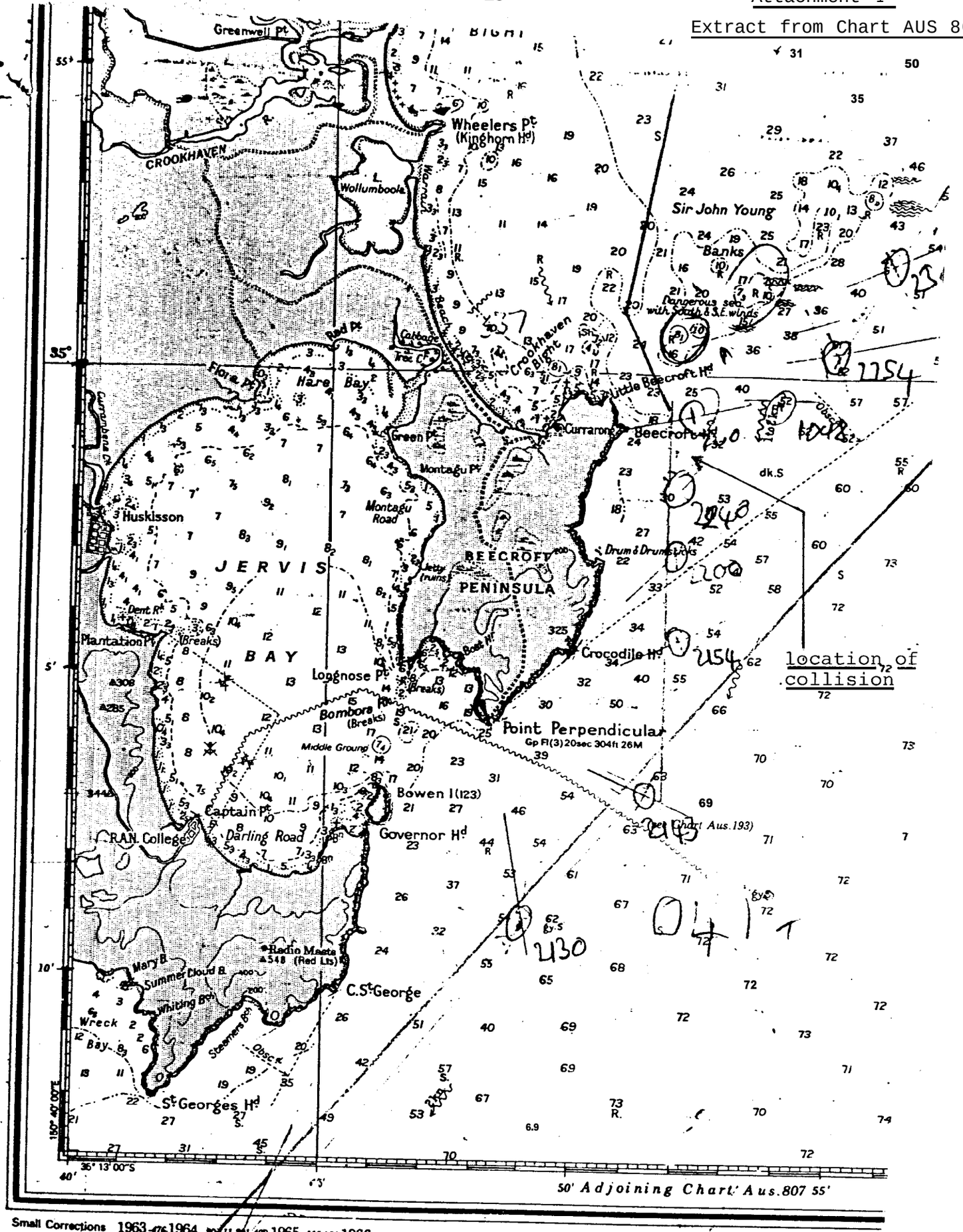
Paragraph 3.11 of the ANL manual is relevant to the composition of the watch immediately before the collision. It states:

> "It is incumbent upon the Master to increase any Watch manning as necessary commensurate with existing conditions, including, but not limited to, traffic density, restricted visibility, mechanical deficiency and search and rescue operations."

This instruction is considered to apply to the situation on LYSAGHT ENDEAVOUR from 2145 hours and the master should have complied with it, by either remaining on the bridge himself or by having an extra rating in the wheelhouse on standby for helmsman duty.

Attachment 1

Extract from Chart AUS 808



Small Corrections 1963-476 1964-[illegible] 1965-115-180 1966-107-171-308-511-527 1967-68-499 1968-397-398-402 1969-44-92-233 1970-246-336 1971-66-257 1972-116 1974-78-[3-5]-[illegible] 1976-331 1977-175 1978-170-462-539-552-[14-12] 1979-142-416 1980-443-614 1981-352 1982-102-237 [28 7]-429 1984-140-[illegible]-[175-8]-780-885.

NAVIGATION ACT 1912

APPOINTMENT OF PERSON UNDER SECTlON 377A

In pursuance of the powers and functions conferred on the Minister by sub-section 377A(l) of the Navigation Act 1912, and delegated by him to the person for the time being occupying or performing the duties of First Assistant Secretary, Maritime Safety Division, Department of Transport, I, Paul Barcroft Eccles, hereby appoint John Michael Quinlan to make a preliminary investigation under that section into the circumstances of the collision between the motor ship Lysaght Endeavour and the yacht Grunter in the vicinity of Latitude 35 degrees 02 minutes South, Longitude 150 degrees 52 minutes East on the 16th day of December 1985 and in particular:

- the factors which caused or contributed to the collision

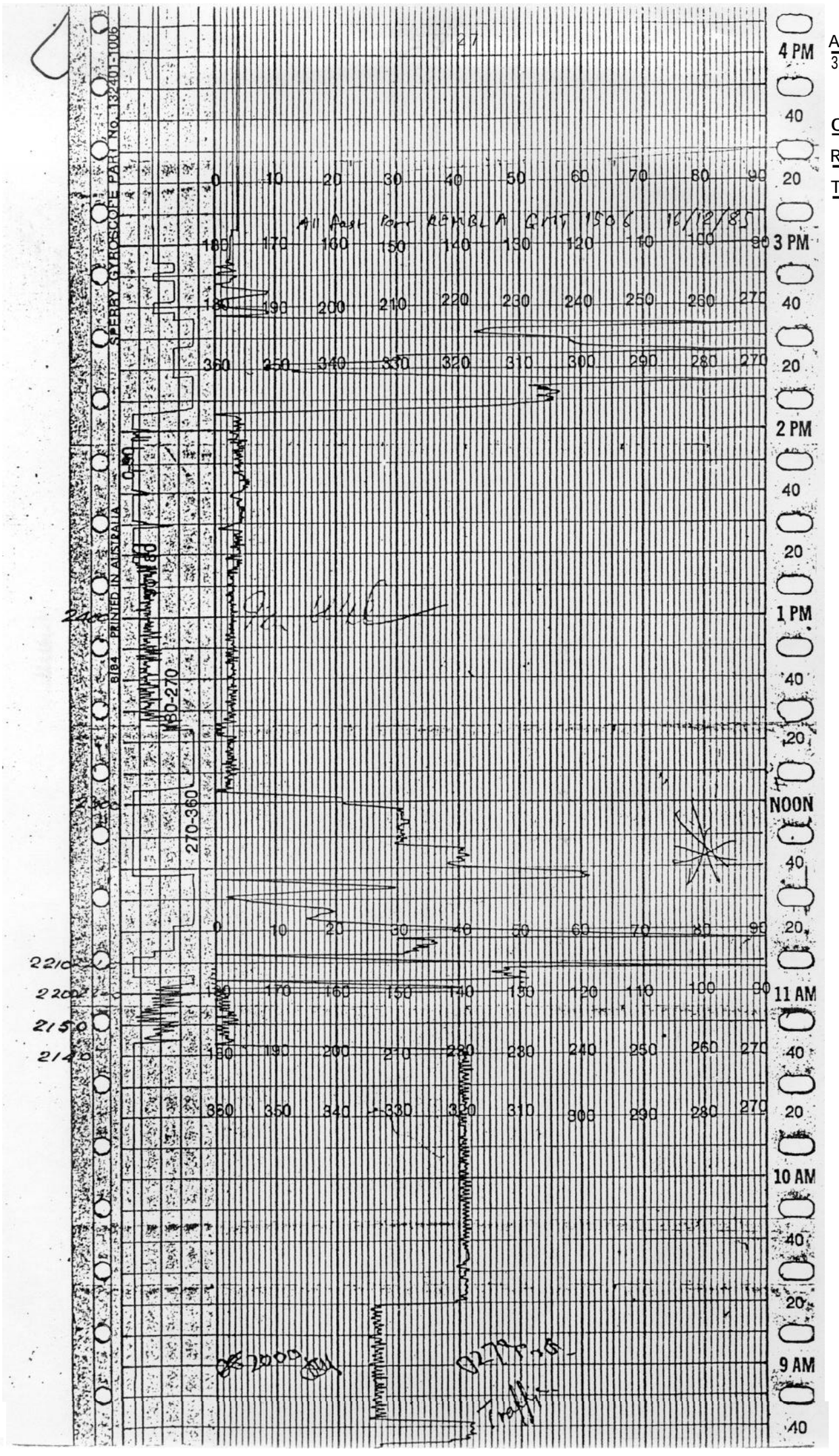
- whether there was any contravention of the International Regulations for Preventing Collisions at Sea 1972 by either, or both, vessels and whether this was a contributory factor to the collision.

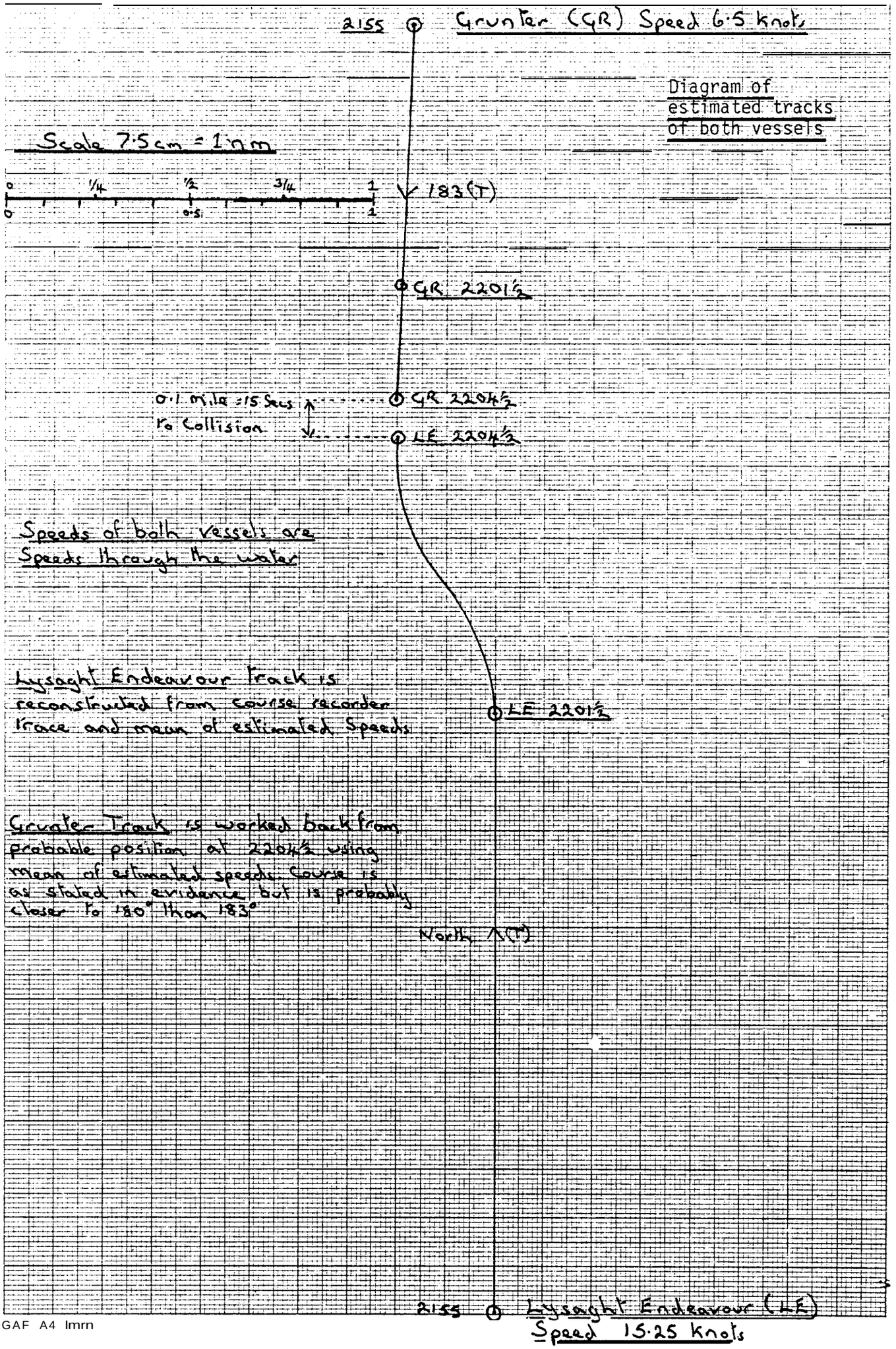
Dated this 20th day of December 1985

P B Eccles
First Assistant Secretary
Maritime Safety Division

Attachment 3

Course Recorder Trace




2155
Gruntar (GR) Speed 6·5 knots
Diagram of estimated tracks of both vessels
Scale 7·5cm = 1nm
0 1/4 1/2 3/4 1
0 0·5 1
183(T)
GR 2201½
0·1 mile = 15 secs
GR 2204½
LE 2204½
Speeds of both vessels are Speeds through the water
Lysaght Endeavour track is reconstructed from course recorder trace and mean of estimated speeds
LE 2201½
Gruntar Track is worked back from probable position at 2204½ using mean of estimated speeds. Course is as stated in evidence, but is probably closer to 180° than 183°
North (T)
2155
Lysaght Endeavour (LE)
Speed 15·25 knots

GAF A4 Imrn