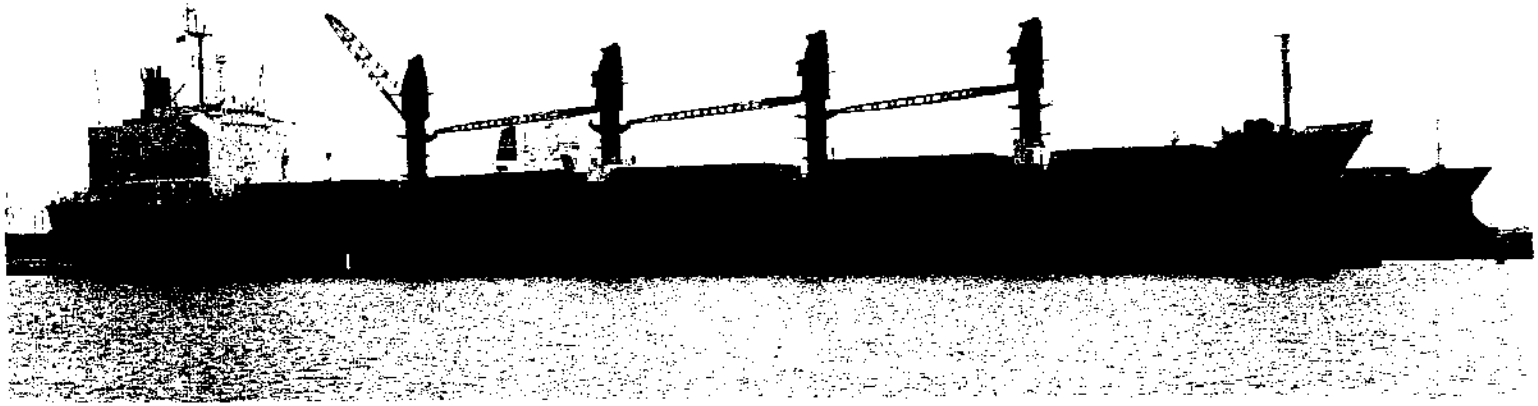
Contents

Goonzaran



New Noble

Summary

The 135,000 tonne deadweight bulk carrier Goonzaran anchored four miles off the Port of Newcastle, New South Wales, at 2200 on 20 November 1995, to load a cargo of coal. The vessel was scheduled to berth on 25 November.

The 38,305 tonne deadweight bulk carrier New Noble anchored about four miles off Newcastle, at 0955 on 22 November, about 1.2 miles south of the Goonzaran. New Noble was also to load coal and was due to berth about midday on 24 November.

At 0000 on 23 November, the wind speed and direction recorded at Nobbys Head signal station was from the south-east at eight knots (force 2). At 0700, the wind speed had increased to 16 knots, veering to the south-south-east and increasing to 30 knots by 0800. At 1000, the wind speed had risen to 38 knots from the south-south-west.

With the increasing wind speed and heightening sea and swell, the New Noble's Master ordered the engine should be ready for immediate use, but the ship reportedly maintained its position throughout the morning. At about 1400 on 23 November, the Master became concerned that the vessel was dragging anchor to the north. The bulk carrier, Goonzaran, was the closest ship, lying to the north and in the line of drift of New Noble.

At about 1420, the Mate was sent forward with three crew members to weigh anchor. At about this time the Masters of Goonzaran and New Noble made contact on channel 6 VHF and the Master of New Noble informed Goonzaran that he was weighing anchor. New Noble's engine was used to try and take the weight off the anchor cable and five and a half shackles (150 m) was recovered, but the windlass could not recover the final three shackles.

At approximately 1448, New Noble had closed to about 3 cables (550 m) from the bow of Goonzaran and New Noble continued to drag anchor towards the larger ship. On board Goonzaran the engine had been put on stand-by and the Mate and three crew were forward by the windlass. At about 1450, Goonzaran paid out a further 90 m of anchor cable, to 12 shackles. However at about 1458, New Noble's anchor fouled Goonzaran's anchor cable drawing the ships together, before clearing itself a few minutes later.

At 1500 New Noble collided with Goonzaran in way of number three hold and then passed down Goonzaran's side making two further contacts.

Once clear of Goonzaran, New Noble recovered its anchor and after checking for ingress of water put out to sea to await port entry.

Goonzaran suffered significant damage to the hull and deck plating. New Noble suffered relatively minor damage to the bow at the forecastle head level and an indentation in its bulbous bow. Nobody was hurt as a result of the collision.

On 24 November, both ships were brought into port for inspection and necessary repair.

Sources of information

Master and crew of Goonzaran

Master and crew New Noble

Staff of Nobbys Head Signal Station

The Australian Maritime Safety Authority

The Master, mv Lapithos

Pilot, Newcastle Pilot Service

Nippon Kaiji Kyokai

Bureau of Meteorology, RAAF Base, Williamstown

The Australian Survey and Land Information Group (Geodetic Operations)

The Hydrographer, RAN

Australian Federal Police, Scientific Service

Narrative

The ships

The Panamanian flag bulk carrier Goonzaran was built in Koje Shipyard of Samsung, South Korea, and delivered in December 1994. The vessel is 269.37 m in length overall, with a breadth of 43 m and a depth of 23.8 m. It has 9 cargo holds and has a deadweight of about 135,000 tonnes at a draught of 16.5 m.

The ship is powered by a five cylinder HHI-EMD B&W diesel engine developing 13,018 kW (17,450 b h p), driving a single shaft and a fixed pitch propeller providing a service speed of 14.4 knots. The engine room is operated as an unmanned machinery space, with the engine controlled from the bridge, though the control room is manned when manoeuvring. Electrical power is supplied by three B&W generators, each of 600 kW.

The ship carries two bower anchors, each of 14.82 tonnes. The anchor cable is of 95 mm diameter, with 14 shackles of cable (384 m) connected to the port anchor and 13 shackles (356 m) connected to the starboard side.

Goonzaran had a crew of 19, all but one, a Chinese national, were Korean.

The Philippine bulk carrier New Noble was built by Kawasaki Heavy Industries, Kobe, Japan, in 1984. It was launched as Sanko Noble, but changed its owners and name in 1986. The ship is 179.41 m in length overall, with a beam of 29.01 m and a depth of 14.42 m, it has five holds and a deadweight of 38,305 tonnes at a draught of 10.823 m.

The ship is powered by a 5 cylinder B&W diesel engine developing 5,296 kW, driving a single shaft and propeller developing a service speed of 14 knots. The engine is controlled from the engine room, the required movements being transmitted by telegraph between the bridge and engine room. Electrical power for domestic services, auxiliary machinery and deck equipment is supplied by three 400 kW generators.

The ship carried two bower anchors, each of 5.9 tonnes. Original documents supplied by the class society show that the vessel was originally equipped with 605 m of 66 mm anchor chain, some 300 m (11 shackles) connected to each anchor.

New Noble had a crew of 23 Philippine nationals.

The incident

Times

The times recalled by witnesses and the times given in Goonzaran's log book are not regarded as accurate. No contemporaneous times were maintained by either ship, except as recorded on the engine movement print out from the two ships and Goonzaran's course recorder.

The times used in this report have been taken from the time signal automatically recorded on the tape recording of VHF traffic through Nobbys Head, New Noble's engine

print out and Master's statement, Goonzaran's course recorder and engine print out. Any time difference between the actual time and the time maintained by either ship cannot be accurately assessed.

The anchorage

Goonzaran arrived off the port of Newcastle, New South Wales, on the evening of 20 November 1995, after a voyage of 13 days from Go Jeong, South Korea. The ship's draught on arrival was 7.7 m forward and 9.2 m aft. It was due to enter Newcastle to load coal on 25 November. The ship anchored to about 8.5 shackles (233 m) in about 42 m. of water with Nobbys Head lighthouse bearing 277 x 4.3 miles.

The officers of the watch aboard Goonzaran maintained sea watches while at anchor. The watch officers used three land-marks, Nobbys Head, the Sea buoy and the wreck of Sigma (on Stockton Beach) and bearings of these marks showed that the ship maintained position throughout 20, 21 and 22 November.

New Noble arrived off Newcastle before noon on the morning of 22 November, with a draught of 3.67 m forward and 6.21 m aft, having sailed from the port of Niahama, Japan, on 8 November 1995. The vessel anchored at 0955, with Nobbys Head Light bearing 298° x 4 miles, to 8.5 shackles in about 45 m of water. The wind at the time was from the east-north-east at about 22 knots with the high maximum [1] swell averaging at 2.5 m with a 9 second time period. New Noble was scheduled to enter harbour around midday on 24 November.

The two vessels were anchored with Goonzaran about 1.2 miles north of New Noble. In all, there were three other vessels anchored off Newcastle, the closest, Stella, was anchored to the south-east of New Noble at about 0.8 miles. The Masters on both ships, Goonzaran and New Noble, ensured that the ship's engines were ready for immediate stand-by and able to manoeuvre within ten minutes.

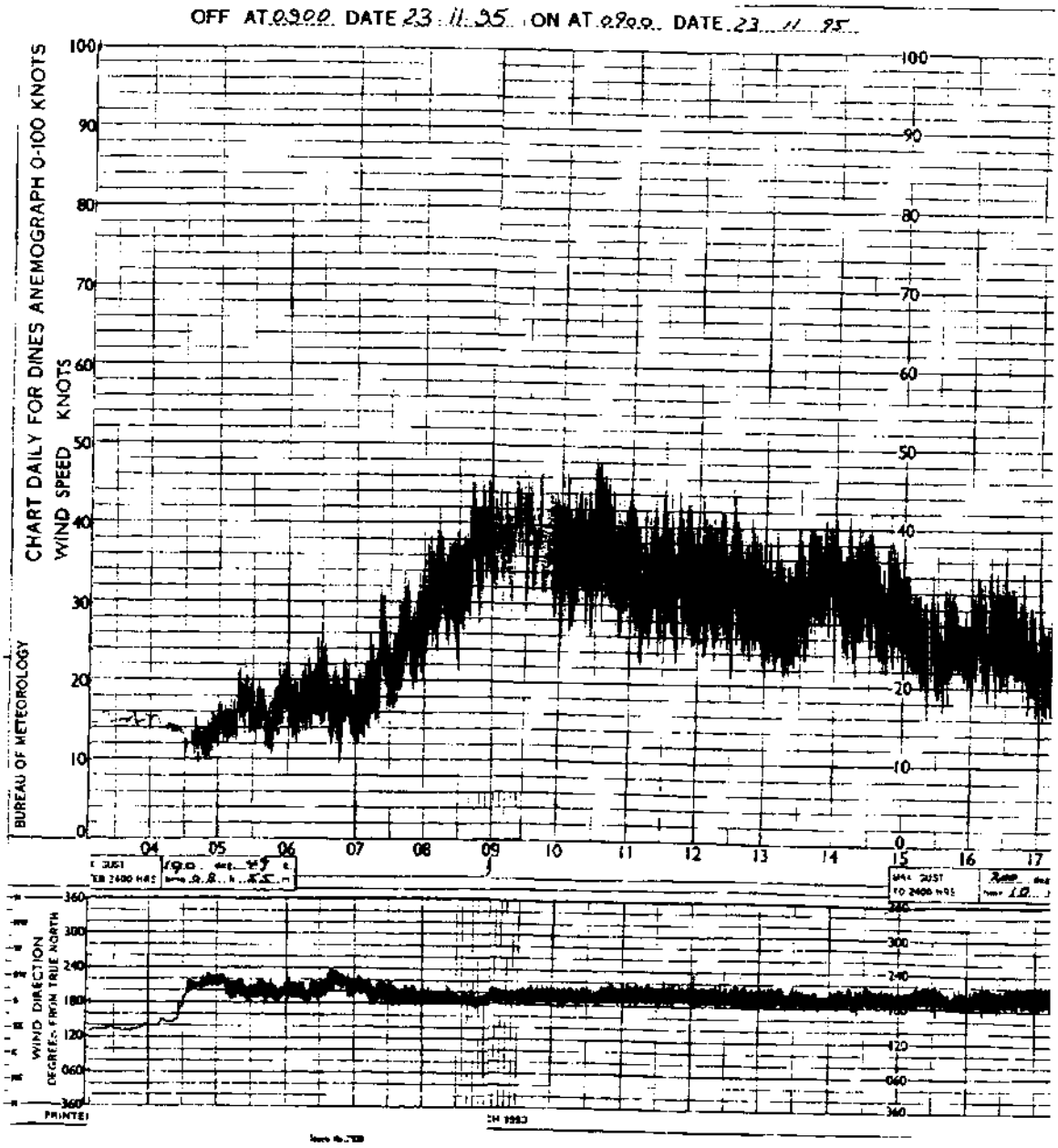
New Noble maintained sea watches while at anchor, fixing the ship's position at regular intervals to ensure that the ship maintained its anchor position. The officers used bearings and distances off Nobbys Head and positions given by the global positioning system (GPS) monitor. The radar was kept running at all times.

During 22 November, the wind moderated to about 10 knots and veered to a south-easterly direction a little before 2300. At about 0430 on 23 November the wind veered the south-south-west and increased in strength to about 20 knots. By 0730 the wind was gusting to 30 knots and by 0900 gusts of 46 knots were being experienced with a mean of about 38 knots.

Goonzaran's account

According to those on Goonzaran, the ship was lying easily to its anchor throughout the morning of 23 November. Routine maintenance work was being carried out on board. At 1200, the Second Mate took over the

[1] High Maximum average is the average height of the top ten per cent of swells measured in the ten minute period.



Nobbys Signal Station Wind Speed (Knots) and direction record

(Note for the purpose of this report the above record is a segment from a composite of the charts 0900–22/11/95 to 0900–23/11/95 and 0900–23/11/95 to 0900–24/11/95)

watch and checked the ship's position and the distance from New Noble, which was about 1.2 miles to the south. Two of the three electrical generators were connected to the main switchboard, supplying sufficient power for domestic use and all machinery, including the windlass if required.

At 1400, the Second Mate realised that New Noble seemed closer and confirmed by radar that the ship was 0.9 miles off. He immediately alerted the Master, who was on the bridge, and the engine room. The Master ordered the crew to standby.

The Master sounded five short and rapid blasts on the whistle to attract New Noble's attention. At 1416, the Master called New Noble on VHF channel 16 and, at 1417, contact was made between the two vessels and they switched to channel VHF channel 6 to exchange information. Goonzaran's Master asked whether New Noble was underway. New Noble's Master confirmed that they were heaving up the anchor and that the vessel was drifting. At this time the vessels were about 0.6 miles (1100 m) apart.

The course recorder on Goonzaran was switched on and aligned at 1426. By 1430, New Noble was about 0.5 miles ahead of Goonzaran, apparently heading south-east. The Master placed the engines on stand-by and, at 1431, the engine control room had passed engine control to the bridge.

Those on the bridge watched New Noble's heading change as the vessel recovered its anchor and a wake from the ship's propeller could clearly be seen. Initially, New Noble seemed to be heading at about right angles across Goonzaran's bow to the south-east, it then seemed to turn through 180°, back across Goonzaran's bow. The Master stated that at about 1448, New Noble turned from a westerly heading and seemed to head across Goonzaran's bow once again. By this time the vessels had closed to about 4 cables (740 m). The concern that Goonzaran's Master had been feeling turned to one of anxiety. He considered getting Goonzaran under way, but to pick up his anchor would have meant closing New Noble. New Noble's engine was apparently going full ahead and from Goonzaran's bridge it looked as though New Noble's anchor chain was leading astern.

At 1451, Goonzaran's Master called Newcastle Harbour (Nobbys Head) on channel 9 VHF. Just before 1452, Newcastle Harbour responded and Goonzaran's Master explained what had been happening between his ship and New Noble and requested Newcastle Harbour to contact New Noble.

At about this time the Master ordered that a further 3 shackles of cable should be slacked out and the cable was payed out to 12 shackles (330 m).

Between 1452¾ and 1453½ Newcastle Harbour called New Noble a number of times on VHF channel 9 and channel 16 without success. At 1553¾, Goonzaran's Master called Newcastle Harbour reporting that New Noble was about 100 m off and that as the vessel was very close he could not pick up his anchor but had to wait.

At 1455½, Goonzaran's Master again called Newcastle Harbour indicating that New Noble was about 50 m off. This was confirmed by Newcastle Harbour and the Nobbys Head operator immediately called New Noble on channel 9 VHF. However his transmission was interrupted by Goonzaran calling 'emergency'. This was confirmed by Harbour control who again called New Noble on channel 9 VHF. This last call was made just before 1458.

Just after 1458, New Noble started calling Goonzaran on channel 6 VHF before switching to Channel 16 and making contact with Goonzaran and switching to a working frequency of channel 6. Goonzaran's Master responded immediately by telling New Noble to cut its anchor chain, which was queried by New Noble's Master.

At 1459¼, Goonzaran's Master again called Newcastle Harbour and passed a one word message, 'emergency'. There was no immediate reply so ten seconds later Goonzaran called Newcastle Harbour once again and the Harbour control responded immediately, reporting that the anchor chains were fouled and requesting a tug to assist. Just after 1500, the Goonzaran's Master called on the radio 'that ship is into ten metres', this was followed by a transmission to Newcastle Harbour 'help me, help me - tug boat - over.' Newcastle Harbour called the tug Iron Cove, which had already been alerted by the traffic on channel 9 VHF. Newcastle Harbour then called Goonzaran and the Master acknowledged the call and then said 'Newcastle - very dangerous' and the radio operator confirmed with Goonzaran that a tug was on its way.

According to Goonzaran's documents the time of collision was put at about 1503.

New Noble's account

When the Third Mate came on watch at 0800, he checked the ship's position by radar distance and bearing, and a check against the GPS. In his estimation the ship had maintained its position within the scope of the anchor chain. Two of the three electrical generators were connected to the switchboard, supplying ample power for domestic services and the ship's machinery, including the windlass, should it be required.

New Noble's crew were working preparing the holds for loading the following day, with some of the deck crew cleaning no.1 hold under the Mate's supervision. On the bridge, the Third Mate was joined by the Master, who was concerned about the wind and sea conditions. At 1030, the wind was consistently gusting at 48 knots from the south-south-east and, at 1045, the Master ordered that the engine room should be warned to have the engine immediately ready and to ensure an engineer and oiler were in the engine room, ready to start the engine. After 1045, the general wind strength decreased but only marginally so. The Master left the bridge at 1145 to eat lunch with the Chief Engineer and Mate. After lunch he returned to the bridge at about 1230.

The Second Mate realised that the ship was dragging anchor, but slowly, and

the situation was monitored. The Master was sitting in the Pilot's chair watching the nearby ships. At 1250, Nobbys Head was bearing 289° x 4.2 miles and, at 1400, 287° x 4.2 miles. At about 1415, the Master stated that he realised the vessel was dragging anchor at a faster rate and he decided to weigh anchor with a view to repositioning the ship. He ordered the Second Mate to ensure that the engine was still ready for immediate use. The ship's bosun was on deck and the Master ordered him to go to the forecastle head with two ratings and begin to weigh anchor. At this time he also called the Mate, who was in his cabin. The Mate went to the bridge before going forward to join the boatswain. By the time the Mate reached the forecastle, the Bosun had the anchor in gear and was heaving up the anchor.

The New Noble's engine telegraph was placed on stand-by at 1418½ and confirmed by the duty Engineer within 30 seconds. However, the ship's course recorder was not started.

In the prevailing conditions, with the weight of the ship making the anchor chain 'bar' tight, New Noble's windlass was unable to recover the cable. At 1422, the Master put the engine to dead slow ahead, to take weight off the cable to aid recovery of the anchor. According to the Master, the anchor chain was recovered slowly at the rate of about 5 to 6 minutes every shackle (27.5 m), until the cable had shortened to about 4 shackles on deck when the windlass stopped and the anchor chain was 'bar' tight. The wind was averaging about 30 knots from the south-south-west with gusts of 39 knots. The ship was pitching and rolling in the swell.

At about 1458, New Noble had recovered a little more cable and with about three shackles in the water, New Noble's anchor fouled the anchor cable of Goonzaran. It seemed to those on New Noble that Goonzaran's anchor cable tightened and the two ships were drawn towards each other. The Master used a burst of full astern and the Mate slacked the anchor before heaving on it again and the anchor seemed to clear the other ship's chain. By this time the ships were very close and New Noble was heading at right angles to Goonzaran. New Noble's Master called Goonzaran, initially on channel 6 and then on channel 16, establishing VHF contact at 1458¾.

Goonzaran's Master told New Noble to cut its chain, which New Noble's Master queried and Goonzaran's Master repeated.

At about 1500¼, the ships collided, New Noble's bulbous bow and the flare of the bow contacting Goonzaran in way of no.3 hold and then no. 5 hold and no. 10 hold.

After the incident

By 1504, the operator at Nobbys Head signal station could see that the two ships were apart and at 1508 Goonzaran confirmed that the ship no longer required a tug.

Those on the respective ships assessed the damage. The Master of New Noble decided not to anchor, but put to sea to wait off the port for a berth.

Both ships were berthed on the morning of 24 November, the damage assessed and the necessary repairs started.

The damage to New Noble was not serious and the classification society imposed a thirty day 'condition of class'. The ship subsequently loaded its cargo and sailed, the necessary repairs having to be made within 30 days.

Goonzaran was damaged in three areas on the ship's starboard side. Significant damage was sustained in the area of no. 3 cargo hold and associated hopper tanks and double bottom. The sheer strake and stringer plate were buckled and the framing tripped and buckled, caused by contact with the flare of New Noble's bow. Damage, caused by New Noble's bulbous bow was sustained in the double bottom. Further aft between frames 87 and 93, the sheer strake was bent over and torn and shell plating dented and between frames 49 and 53 the sheer strake was also damaged. The guard rails in these three areas were damaged. Permanent repairs were completed at Newcastle before the ship loaded.

Comment and Analysis

Communications

Nobbys Head Signal Station maintains a VHF radio watch on channel 16 and the working channel for the port of Newcastle, channel 9. The radio traffic on channels 16, 9, 6 and 67, together with a time signal every 10 seconds, is recorded on a multi-track tape recorder.

From the tape of 23 November, it can be established that the first attempted contact was made by the Master of the Goonzaran just before 1416, calling New Noble on Channel 9. This call was repeated about one minute later before switching to channel 16 at 1417, when the Master of New Noble replied and both ships switched to VHF Channel 6.

At 1417½, the Master of New Noble confirmed that his ship was weighing anchor. New Noble's engine was put on stand-by at 1418½ ship's time. Although it is not possible to say how accurate the ship's clocks, and particularly the engine movement printer, may have been, the engine was put on stand-by after or about the same time as the Goonzaran's Master queried New Noble's actions when initial VHF contact was made at 1416.

Neither ship made any further attempt to contact the other for a further 34 minutes.

At 1451, Goonzaran called Nobbys Head on Channel 9. Contact with Nobbys Head was made just before 1452 when the Master informed the signal station of the dragging ship and that the ship might be in trouble. Goonzaran's Master asked that Nobbys Head contact New Noble.

Just before 1453, Nobbys Head started to call New Noble on VHF Channel 9 after repeating the call the Signal Station tried to contact New Noble on Channel 16 at 1453¼. and again at 1453½, without result. At 1453¾, Goonzaran called Nobbys Head on channel 9 to report that the ships were then about 100 m apart and that he would call New Noble. Nobbys Head confirmed that the signal station had tried both Channels 9 and 16 without success an Goonzaran's Master stated:

> *'Ah..I pick up anchor but they are very close so I am waiting - over.'*

His voice indicated deep concern at this stage.

At this time an incoming vessel called Nobbys Head on Channel 9, stating his intention to keep clear of the two vessels. Goonzaran did not call New Noble, Channel 9 was busy, and he did not call on the normal watch channel 16. Instead at 1455½, the Master again contacted Nobbys Head to report that New Noble was 50 m away. Nobbys Head confirmed this and Goonzaran's Master replied with;

> *'Emergency - over.'*

Nobbys Head called New Noble twice in quick succession.

A few seconds after 1458, New Noble's Master started to call Goonzaran without identifying himself.

This took the form of a succession of calls over 30 seconds, initially he called on Channel 6, switching to channel 16 giving a working channel of channel 6.

At 1458¾ VHF contact was made between the two ships on channel 6 and it was at this time that Goonzaran's Master urged New Noble to cut its chain.

Just after 1459¼, Goonzaran's Master reverted to contact with Nobbys Head. His voice indicated extreme anxiety as he called for a tug at 1459¾, indicating that the anchor cables were fouled and the ships were being pulled together. Again just before 1500¼ he reported New Noble as being 10 m off his vessel and about 30 seconds later a message:

> 'Newcastle Harbour - Help me - tug boat - over.'

The Goonzaran had maintained a VHF radio watch on channel 9, the local port radio operating channel, with channel 16 also monitored. New Noble had maintained watch on channel 6, the working channel used by the two ships in their initial contact. It was stated that New Noble was also 'watching' channel 16, although the ship failed to respond to calls on channel 16 made by Nobbys Head just after 1453¼.

The communications between the two ships was inadequate and the radio watch by those on New Noble was deficient, in that Channel 16 was not effectively monitored. In the Inspector's opinion, New Noble's Master should have ensured that Goonzaran was kept appraised of the situation, particularly when New Noble was unable to recover its cable.

Newcastle anchorage

The anchorage off Newcastle provides reasonable holding ground in fair weather but is exposed and subject to pronounced swells. The Port Navigation Information, issued by the Port of Newcastle states that:

> *While no anchorage's are recommended off the Port for all weathers, good fair weather anchorage can be found two or three miles south of the restricted area off the entrance i.e. south of an imaginary line 127 from the Southern Breakwater light.*

The Australian Pilot Volume 3 (Supplement 11 of 1994) notes at page 42:

> A safe, but exposed, anchorage may be found S of a line 127° from Nobbys Head Light. A good anchor watch should be maintained and engines kept at instant readiness.

Guide to Port Entry, published by Shipping Guides Limited states at page 118:

> No anchorage off the port is recommended for all weathers. However, a fair weather anchorage may be found South of a line 127° from Nobbys Head Light. A good anchor watch should be maintained and main engines should not be dismantled whilst at anchor. Weather

conditions may deteriorate in a very short period. During Southerly weather, sea and swell conditions may become confused. Vessels at anchor should weigh and proceed to sea until the weather moderates.

Anchoring

The International Association of Classification Societies provides a standard [2] for the design of anchoring equipment, which requires that the anchoring equipment is intended for temporary mooring of a vessel within a harbour or sheltered area when the vessel is awaiting a berth or the tide. The standard specifically states:

> A1.1.2 The equipment is therefore not designed to hold a ship off fully exposed coasts in rough weather or to stop a ship which is moving or drifting. In this condition the loads on the anchoring equipment increase to such a degree that its components may be damaged or lost owing to the high energy forces generated, particularly in large ships.

Anchoring equipment is designed to hold a ship in good holding ground in conditions such as to avoid dragging of the anchor.

The size of anchor cables and the mass of the anchor itself is assigned on the basis of a ship's equipment number. This number is derived from a formula based on the ship's displacement at summer load water line, the ship's breadth and the area of hull, above the summer load water line, exposed to wind.

> *A1.1.4 The Equipment Number formula for anchoring equipment here under is based on assumed current speed of 2.5 m/sec[3], wind speed of 25 m/sec[3], and a scope of cable between 6 and 10, the scope being the ratio between the length of chain paid out and water depth.*

Ships are not usually provided with any document explaining the design parameters of anchors and the wind and current conditions for which they were designed. Judgement on suitability on anchoring in various weather and tidal conditions is left to the master, usually using experience and some basic knowledge. Although, with elements such as swell and the quality of the bottom being so variable, there can be no definitive quantification of anchor limitations. A knowledge and understanding of the IACS requirements would contribute to safety information available to masters of ships.

Anchors provide maximum holding power when the cable is pulling horizontally at the anchor shank. The efficiency of the anchor is reduced significantly as the angle between the cable and shank of the anchor increases. A rule of thumb is that a pull of 5° above the axis of the anchor shank reduces the holding power by 25 per cent and a pull 15° reduces the holding power by 50 per cent[4]. This 'rule of thumb' will vary with the quality of the sea bed. It is therefore

[2]Requirements concerning Mooring and Anchoring, International Association of Classification Societies, IACS Reg. 1994/Corr.95.

[3] 4.86 knots current, 49 knots wind speed

[4] Danton, G., *The Theory and Practice of Seamanship, 10th Edition Revised.* (1987), Routledge, London.

important that sufficient scope of anchor chain is deployed to allow the cable to lie along the seabed before the anchor shackle (connecting the cable to the anchor shank).

Mariners commonly use a ratio of 4 or 5 m of cable to every metre of water, depending upon a subjective judgement regarding the weather conditions, the ships windage, etc. A more precise rule is $25\sqrt{D}$, where D is the depth of water in metres. Based on this formula a minimum scope of about 6 shackles was required by both ships and both exceeded the theoretical minimum.

When New Noble anchored on 22 November the average maximum swell height recorded at the outer 'wave rider' buoy off Newcastle was 2.5 m with a time period of 9.3 seconds. There was a marked increase in wind strength from the south-south-east between 0700 and 0900. Throughout the morning gusts of 46 or 48 knots were experienced. The wave rider buoy recording mechanism suffered a malfunction and the next available reading was 1450 on 23 November, at which time the top ten per cent of the swell height was averaging 4.3 m with a time period of 8.4 seconds.

It is therefore reasonable to assume that the swell also increased during the morning and that, with winds of over 35 knots, in a light draught condition. New Noble was at the full scope of its anchor chain. At full scope the chain would have made an angle of over 10° with the horizontal, significantly reducing the holding power and the swell would have increased the probability of the anchor breaking out of its holding ground.

The paying out of extra cable can help to reduce the chances of the cable lifting at the shank and, where it does, it can reduce the angle that the cable makes with the horizontal. However, in 42 m of water paying out to ten shackles (275 m) will only reduce the angle to about 9° at the shank.

The Master did not consider paying out more cable as he stated that New Noble carried only 9 shackles in each locker (247 m). However, the ship's certificates showed that a total length of 605 m (22 shackles) of anchor cable was carried in the two lockers (11 in each locker), in line with the classification society requirements. The classification society confirmed that the anchors had been ranged in dry dock, during a special survey in March 1984, that no cable had been cropped and that the ship carried 22 shackles.

Even had the Master known the full length of cable available to him and had he released more cable it is doubtful, given the depth of water, that it would have prevented the initial movement of the anchor on 22/23 November or the final dragging incident, which led to the collision.

New Noble, as were the other ships at anchor, was subjected to the upper limit of wind speed for which the anchoring equipment was designed. Although the current in the area would not approach the 4.8 knots maximum, the ship did have increased windage and was subject to significant swells.

Position fixing

The officers on Goonzaran operate in accordance with Korean Line Corporation Safety and Quality Management procedures. This requires that, while at anchor, the ship's position should be fixed by the bearings of at least three objects and at frequent intervals. The officers on Goonzaran apparently complied with these procedures, cross checking the land bearings with GPS positions.

The officers on New Noble used both radar and GPS positions at various times, but seem not to have routinely checked one against the other. When the vessel anchored the bearing and distance position was checked against the GPS reading and a difference of about 300 m was noted. However, there was evidence suggesting that the initial radar bearing and distance marked the bridge position as the anchor was dropped and the GPS position was taken when the ship brought up and was lying about 300 m from the ship's anchor. Whether this was the case or not, it seems that nobody was alerted when the GPS positions did not coincide with radar bearings and distances. This was attributed to error in the GPS position.

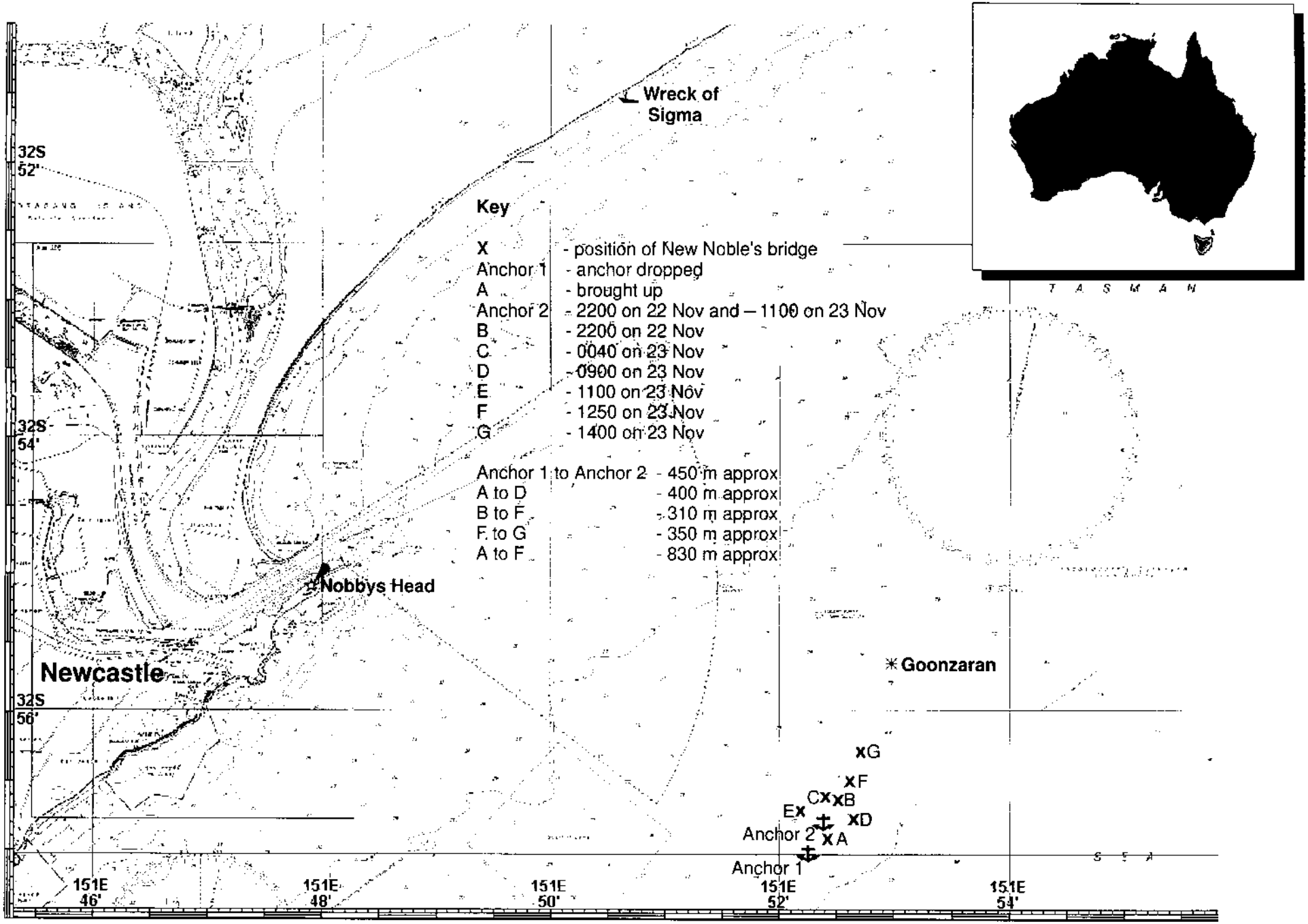
Checks made with the Australian Surveying and Land Information Group showed that the satellite constellation, providing the GPS derived positions, were excellent with between 6 and 10 satellites available on the morning of 23 November. Off Newcastle, positions obtained from satellite navigation systems are referred to WGS. Datum and no corrections are necessary in plotting such positions on the chart.

Anchorage Positions

Goonzaran anchored in a position with Nobbys Head bearing 277°x 3.4 miles with 8.5 shackles (233 m) of anchor cable in the water. The distance from the ship's stem to the bridge is 200 m, giving a maximum radius of swing, as measured from the bridge, of 430 m. The ship maintained its anchor position from the time it dropped anchor on 20 November until it weighed anchor on 24 November. Throughout the time at anchor, and particularly on 23 November, the vessel was windrode. On the afternoon of 23 November, the ship was yawing over an arc of 30° to 35°, between a heading of 118° and one of 152°.

New Noble anchored in a position about 1.4 miles south of Goonzaran. The reported position of New Noble's anchor was with Nobby's Head bearing 298° x 4.1 miles. New Noble also dropped 8.5 shackles in about 42 m of water, a ratio of depth of water to cable used of about 1:5. A position (of the ship's bridge) was marked on the chart with Nobbys Head bearing 296° x 4.2 miles, with the ship, lying windrode 300 m to the north-east of its anchor. The maximum radius of swing from the anchor was about 380 m, as measured from the bridge.

So as not to clutter New Noble's chart, the check of the anchor positions for 22 November were largely erased. However, a position for 2200 remained on the chart. It was reported that this position was fixed by radar, with



Portion of chart Aus 207 showing positions at anchor

Nobbys Head bearing 292° x 4.17 miles, and, if accurate, this indicated that the ship had moved its position about 450 m north of the position in which the ship brought up on the morning of 22 November . This means that the anchor itself must have dragged at least 400 m. However, the log book entry for 2400 on 22 November, and the subsequent entries for 0400, 0800 and 1200 on 23 November, all noted that there was 'no sign of dragging'.

The ship's position appears to have stabilised, with the anchor in a new position with Nobby's Head bearing 292° x 4.1 miles and positions marked on the chart for at 0040, 0900 and 1100 on 23 November, are consistent with the scope of chain deployed. Goonzaran at this time, was about 1.1 miles north of New Noble.

Between 0900 and 1250, New Noble moved a further 350 m to the north, in a direct line towards Goonzaran, the bearing of Nobbys Head had altered a further 3° and the distance between the two ships had reduced to about 1 mile. By 1400, the ship had dragged a further 200 m. Both the 1250 position and the 1400 position were established by GPS.

It seems that those on anchor watch on New Noble did not appreciate that the anchor position had changed on 22 November, and were slow to accept that the anchor was not holding in the late morning of 23 November.

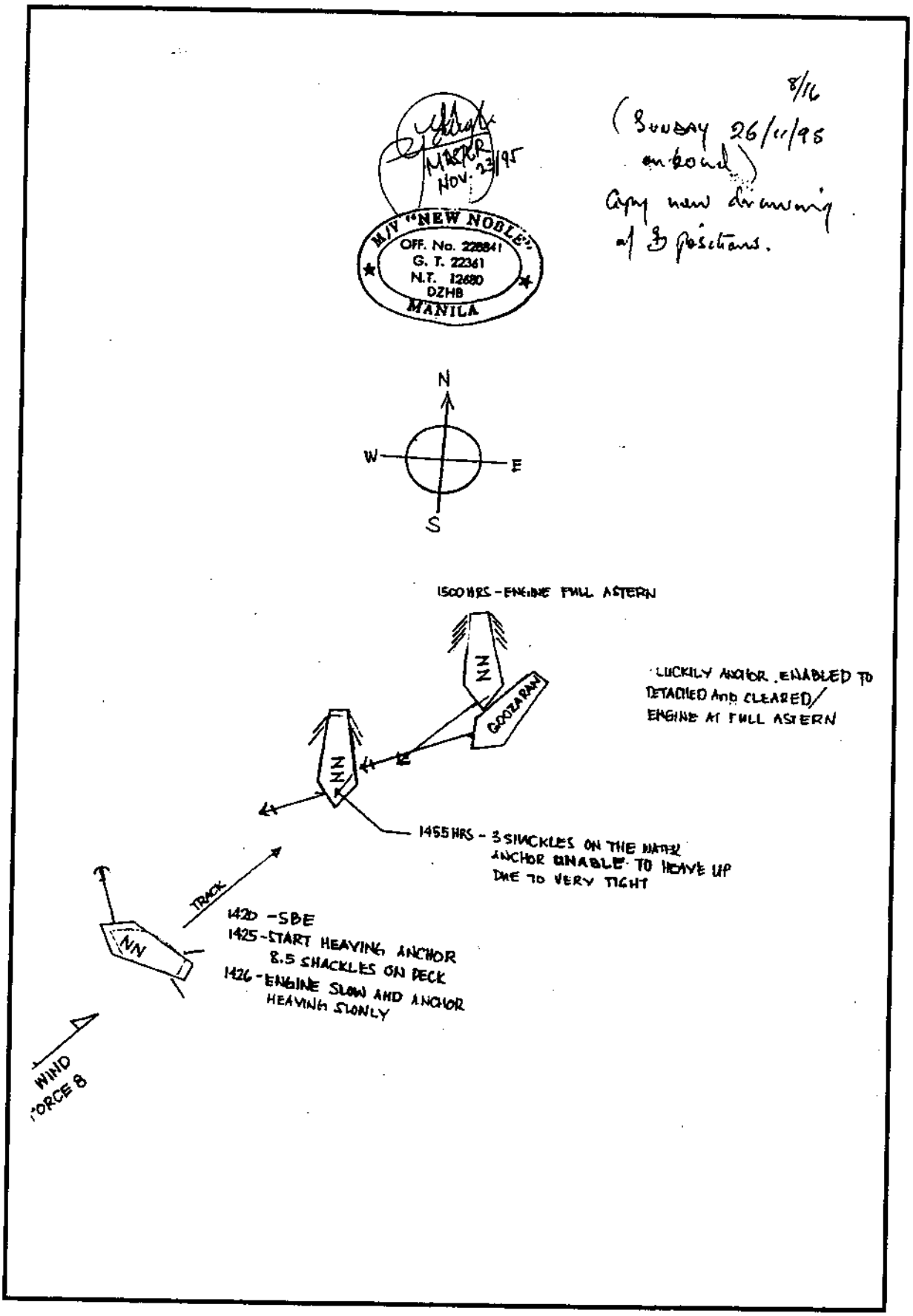
Given the rate of dragging between 1250 and 1400, it seems that the vessel may well have started to drag anchor on the morning of 23 November at sometime between 1030 and 1100. During this period wind gusts of 48 and 46 knots were experienced and sea and swell conditions had increased, probably in excess of 4 m.

Anchor recovery and getting under way

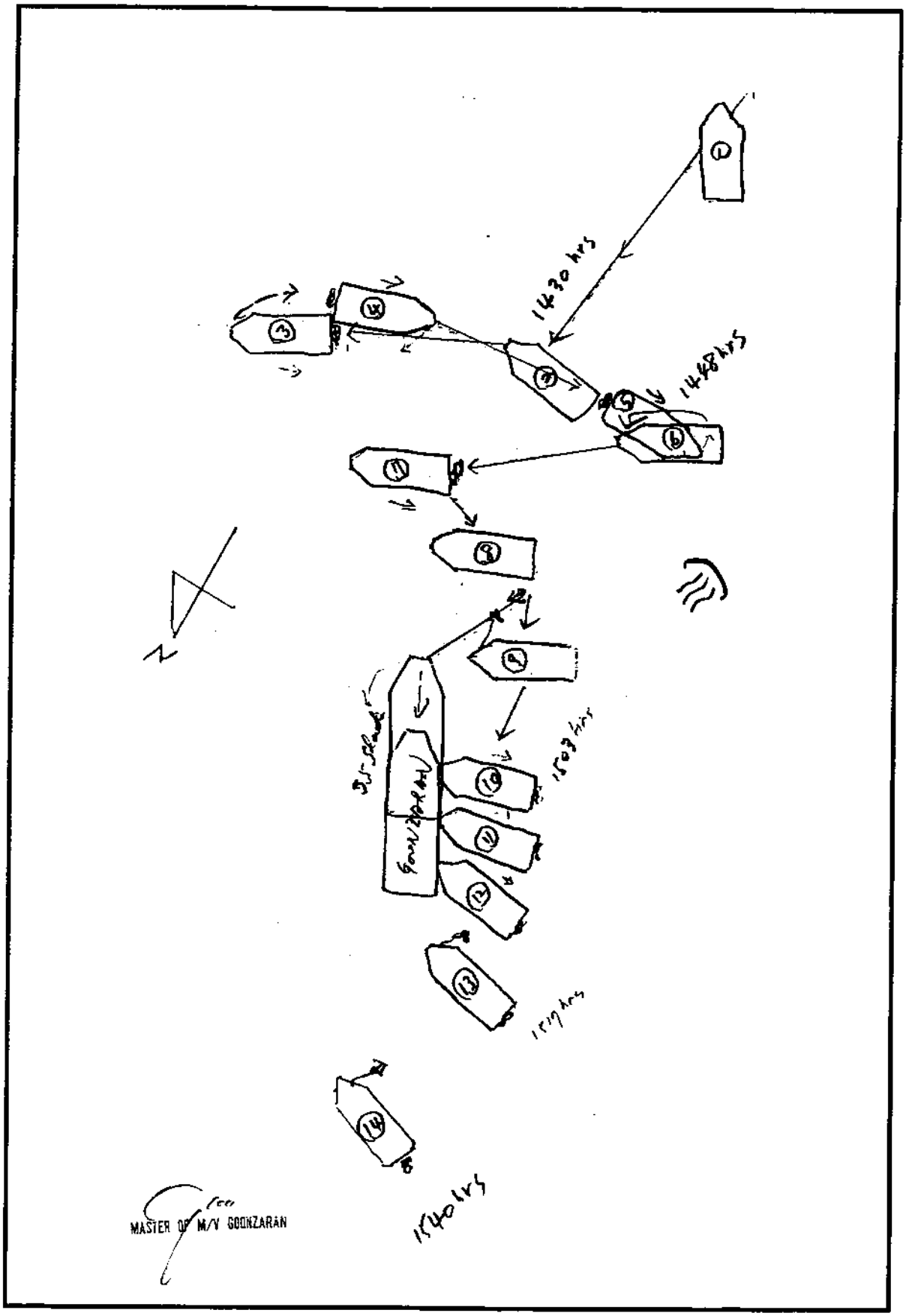
New Noble had been dragging anchor steadily for at least two hours, probably longer before the Master became sufficiently concerned to weigh anchor. New Noble could normally recover her anchor cable at the rate of about one shackle every five minutes. In 40 m of water, the anchor would have been weighed with about 1½ shackles on the windlass, hence, under normal circumstances the anchor would have taken 35 minutes to weigh. It could also reasonably be anticipated that with less anchor cable out and the anchor broken out of its ground the rate of drift would increase.

The Master had the option of dropping the second anchor. However the danger of dropping a second anchor, particularly without veering the ship, is that the two cables can become entangled, making recovery of the anchors very much more difficult and creating greater dangers should the ship continue to drift. The Inspector does not regard dropping the second anchor at 1420 as a realistic option, rather the Master's only option was to get under way and clear the anchorage.

New Noble's Master seemed to have no clear idea of the best way to clear the anchorage, particularly when the ship's windlass was unable to take the



Sketch of incident by Master of New Noble



Sketch of incident by Master of Goonzaran

weight placed on the anchor cable. It seems that he was so preoccupied with the problems of the cable that he did not appreciate the risk of collision until too late and the bridge organisation was not adequate to ensure that he realised Goonzaran's position relative to his own.

He used the engine to try and take the weight off the cable to aid recovery. Between 1422 (New Noble's time) and 1500 (the time of the collision) the New Noble's Master used ahead movements for 20 minutes, mostly slow ahead (7.5 mins) and half ahead (6 mins), astern movements for 7.5 minutes (including 5 mins at full astern) and the engines were stopped (largely transition between ahead and astern movements) for 6 minutes. This would explain the apparent erratic movements of New Noble as viewed from Goonzaran's bridge. The apparent erratic course would have been accentuated by the yawing of Goonzaran, resulting in the ships head changing through thirty degrees.

New Noble was unable to recover the final three shackles of cable (82.5 m). This occurred initially, when still ahead and clear of Goonzaran at about 1445-1450. The Master's only realistic option, when ahead and clear of Goonzaran, was to drive the ship ahead, pulling the anchor chain or letting it go and releasing the 'bitter end'[5]. The cable could not have been cut quickly.

Once the two cables became fouled both Masters' options became limited. Stern movements by New Noble, while maintaining weight on the anchor cable, could, and possibly did, tend to pull the ships together contributing to the collision. According to the New Noble's Master his ship's anchor cleared Goonzaran's cable within a few minutes. However the VHF messages indicate that the cables were fouled at 1458 and were still fouled at 1459¾. It seems probable that the collision took place about 20 seconds after 1500. This would suggest that as the ships closed and New Noble's option of going ahead was lost, the Master's best option was to release his anchor, and its bitter end to allow free stern movement, and drive the ship astern.

Both ships have a similar arrangement for securing the 'bitter end'. The last link of chain cable is placed through the plating of the chain locker, between two brackets and secured by a steel pin passing through the brackets and the last link. In both ships the bitter end securing arrangement is accessible from the forecastle and the pin can be knocked out in an emergency.

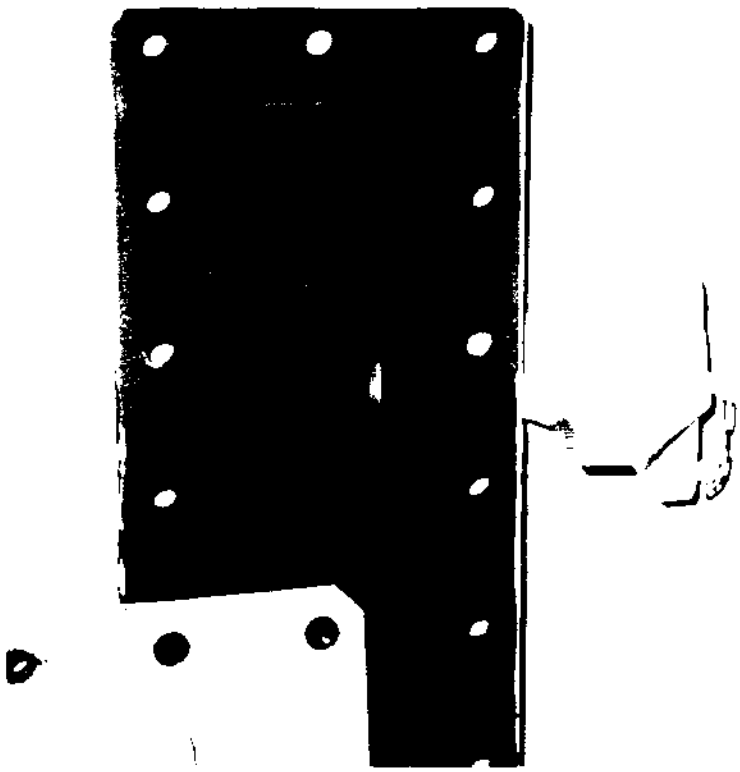
On Goonzaran this pin is about 95 mm in diameter and on New Noble 66 mm in diameter. Either pin would have required a substantial hammer to remove it, but such hammers were kept in the region of the forecastle.

Goonzaran also had the option of releasing the whole of its cable. The

[5]Bitter end, the last links in the anchor chain, secured to the ship; originally the last links of an anchor cable belayed to bitts on deck.

cable was veered until less than one shackle remained in the port locker and the cable would have cleared quickly. However, New Noble was manoeuvring and apparently getting under way.

In the absence of VHF contact between New Noble and Goonzaran, Goonzaran's Master would not have known that New Noble was having difficulty recovering its anchor, although he could see that the ship was drifting closer and he was concerned. At about 1454, it became certain that a close quarter incident could not be avoided by the action of New Noble alone although had New Noble slipped its own anchor at this stage collision may have been avoided. Action at this time by Goonzaran to slip its cable may have avoided the collision.



Bitter End

Conclusions

These conclusions identify the different factors contributing to the incident and should not be read as apportioning liability or blame to any particular individual or organisation.

The following factors are considered to have contributed to the collision between New Noble and Goonzaran:

1. The Master and watchkeeping deck officers aboard New Noble did not appreciate that the ship had dragged anchor from its original position, indicating that the combination of the depth of water, holding ground and ship's freeboard combined to make the anchorage insecure and alert them to the increased risk of dragging anchor in deteriorating weather.
2. The Master and watchkeeping deck officers aboard New Noble did not detect the early signs of dragging and increased the risk of an accident by not reacting sufficiently early to the dragging of the ship's anchor.
3. The need to monitor the ship's position from a consistent set of reference marks was not fully appreciated by the Master and officers on board New Noble.
4. The limitations of the anchors was not fully appreciated by New Noble's Master.
5. Inadequate communications between the two ships meant that Goonzaran's Master was unaware that New Noble's anchor could not be recovered before the collision occurred.
6. New Noble's Master was preoccupied with the recovery of the anchor and did not drive the ship ahead, either dragging the anchor or releasing the bitter end and allowing it to pay out, while the opportunity existed.
7. New Noble's Master undertook no contingency planning regarding recovery of the anchor, nor did he think through his intended action or make any realistic assessment of how long it would take to recover the anchor.
8. New Noble's position relative to the most imminent danger, Goonzaran, was not monitored while trying to weigh anchor.

The Inspector also concludes that:

9. The decision by New Noble's Master not to drop the port anchor was sensible in the circumstances.
10. Goonzaran's Master had the option of slipping his ship's anchor cable and this may have avoided the collision.

Submissions

The provision of sub-regulation 16(3) of the Navigation (Marine Casualty) Regulations require, if a report, or part of a report, relates to a person's affairs to a material extent, the Inspector must, if it is reasonable to do so, give that person a copy of the report, or relevant part of the report. Sub-regulation 16(4) provides that such a person may provide written comments or information relating to the report.

The final draft of the report, or parts thereof, was sent to:

The Masters of both ships and their respective shipping companies.

No substantive submissions or comments were received.

Details of Goonzaran

IMO Number	9108673
Flag	Panama
Classification Society	Korean Register/Nippon Kaiji Kyokai
Ship Type	Bulk
Builder	Samsung Heavy Industries, Koje Shipyard, South Korea
Year	1994
Owner	Sun Gemini Navigation
Manager	Korean Line Corporation
Gross tonnage	75,275
Net tonnage	47,654
Deadweight	135,000 tonnes
Summer draught	16.5 m
Length overall	269.37 m
Moulded breadth	43.00 m
Engine	HHI-EMD B&W
Engine power	13,200
Crew	19 (Korean)

Details of New Noble

Former Name	(ex Sanko Noble)
IMO Number	8307155
Flag	Philippines
Classification Society	Nippon Kaiji Kyokai
Ship Type	Bulk (geared)
Builder	Kawasaki Heavy Industries, Kobe, Japan
Year	1984
Owner	Oriental Ship Management
Manager	Hachiuma Steamship Co
Gross tonnage	22,361
Net tonnage	12,680
Deadweight	38,305 tonnes
Summer draught	10.823 m
Length overall	179.41 m
Moulded breadth	29.01 m
Engine	B&W
Engine power	5,296 kW
Crew	23 (Filipino)