Departmental investigation into the grounding of the Panamanian cargo vessel Pine Trust in Denham Channel, Shark Bay, Western Australia, on 13 October 1997

Report No. 126

Australia
Department of Workplace Relations and Small Business

Contents

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investigation into the grounding of the Panamanian cargo vessel

PINE TRUST

in Denham Channel, Shark Bay,

Western Australia, on 13 October 1997

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Summary

The Panamanian flag general cargo vessel *Pine Trust* sailed from Slope Island Terminal, Shark Bay, Western Australia, at 0930 on 13 October 1997, bound for Japan, with a cargo of bulk salt. Navigation of the vessel was under the conduct of a pilot.

After clearing the berth at 0954, the vessel was steadied on its first heading, and sea speed was ordered. When the Pilot was satisfied with the vessel's position and course, he looked at and discussed documents relating to new procedures for ships with the Master. Course was adjusted due East of Cape Heirisson in accordance with the track on the ship's chart.

After passing No. 9 beacon the Third Mate called the Pilot's attention to the fact that the ship had passed No. 9 beacon and No. 8 beacon should have been on the starboard bow. The Pilot checked the position and realised that the ship was heading for shoal water and was standing into danger. Although action was taken to alter course away from shoal water, Pine Trust ran aground at full sea speed at about 1113, off No. 8 beacon in Denham Channel.

Initial attempts to refloat the vessel using the engine were unsuccessful. A Salvage Master was appointed and, on 16 October 1997, further attempts were made to refloat the vessel with tug assistance. The vessel was refloated at 2345 that day, but lost her port anchor and ten shackles of cable as she came off the sandbank.

After refloating, the tug was cast off and the vessel anchored again for a diver's inspection, in the presence of a Surveyor from the Australian Maritime Safety Authority and a Class Surveyor. Nobody was injured as a result of the incident and there was no damage to the hull, nor was there any pollution. Once it was established that the vessel was seaworthy, the voyage to the discharge port was resumed.

Sources of Information

Master, Officers and Bosun of *Pine Trust.*

Pilot

Skipper, Pilot Boat

United Salvage Pty Ltd

Australian Maritime Safety Authority

Acknowledgement

Portions of charts DMH 661, and WA 661, reproduced by permission of the Department of Transport, West Australia.

Narrative

Pine Trust

The Panamanian registered dry cargo vessel, *Pine Trust*, is a four hatch vessel, of 22,526 tonnes deadweight at a summer draught of 10.02 metres. The vessel is 151.04 metres in length overall, and is powered by a 6 cylinder Sulzer engine developing 6032 kW driving a single, four bladed controllable pitch propeller, giving a service speed of 13.9 knots. The vessel was built in 1979 at Uwajima, Japan and, at the time of this incident, was owned by World Trust Maritime Corporation, chartered to Grandsum Enterprise Corporation under bareboat arrangement, managed by The Eastern Shipping Co., Ltd., and classed with Nippon Kaiji Kyokai.

The Managers, The Eastern Shipping Co., Ltd., had been issued with a Document of Compliance for a Safety Management System under the ISM Code. *Pine Trust* had recently been provided with a manual of procedures, in line with requirements of the ISM Code but at the time of this incident, had not yet obtained a ship's Safety Management Certificate.

Pine Trust had entered the salt trade under charter on a voyage basis between Australia, Japan and Indonesia in 1995. For this particular voyage it was to load at Slope Island Terminal, Shark Bay, Western Australia for discharge at Japan.

The Master, officers, and crew were from the Philippines. The Purser was Japanese. The total number of persons on board was 22.

Slope Island Terminal, Denham Channel, Shark Bay

When *Pine Trust* called at the port on 12 October 1997 to load, the Pilot had been contracted to conduct vessels in and out of the port, as well as to oversee their loading. This meant that, in the case of *Pine Trust*, one pilot would berth the vessel, oversee the loading, and take the vessel out to sea after loading was complete.

Slope Island Terminal is approached from Denham Sound by a dredged channel about 7 cables in length through a bar, leading to Denham Channel. The bar is about 15 miles north north west of the terminal. The channel is marked by three pairs of lit beacons, numbered from 1 to 6, east and west of the channel itself. Three lit port hand beacons, numbered 8, 10, and 12 mark shoal water to the east of Denham Channel. Another beacon, No. 9, is a lit starboard hand beacon.

The distance from a position just off the berth to a position abreast of No. 12 beacon is 6.8 miles, from No. 12 beacon to No. 10 beacon, 2.2 miles, and from No. 10 beacon to No. 9 beacon, 2.1 miles. A distance of 3.9 miles separates beacon No. 9 from the first of three pairs of beacons marking the exit from Denham Channel.

The berth is a dolphin type jetty, with a fixed gantry loader situated east of Slope Island.

Events leading to grounding in Shark Bay

The vessel had arrived at the pilot station one mile north of the bar channel between Denham Sound and Denham Channel on the morning of 12 October 1997, and had embarked the pilot at 0745. The ship subsequently berthed at Slope Island Terminal, also referred to as Topper Island Terminal, at 0945 the same day.

Loading of the cargo of salt commenced at 1000 on 12 October 1997, and was completed at 0840 on 13 October 1997. During the loading, the Master and crew had to warp the ship along the jetty, so that all four hatches could be loaded via the fixed gantry.

The Pilot boarded at 0724 on 13 October 1997, in preparation for departure. On completion of loading at 0840, the vessel's draught was 9.83 m forward and 9.69 m aft. The Third Mate had tested bridge controls and steering systems, put both radars on stand-by and completed the pilot information card, which he left on the chart room table. He had reset the time on the course recorder, but omitted to ensure that the course corresponded with the gyro compass. As a result there was a difference between the gyro and course recorder of around 6°. He checked the gyro compass and repeaters, zeroed the speed log, and checked waypoints on the GPS system for the forthcoming voyage.

At 0930 on 13 October 1997, the vessel prepared to leave the berth. The pilot did not anticipate any problem with shiphandling or underkeel clearance, even though the ship was down by the head, and 8 cms over the stated maximum draught for the port.

The chart used by the ship in pilotage waters was Chart No. DMH 661, published by the Department of Marine and Harbours, Western Australia. The scale of this chart is 1: 50,000, the largest scale chart available for the area and the Second Mate had laid off courses outward from the berth on this chart. The Pilot checked the chart and agreed with the courses laid down, but he did not discuss his pilotage plan with the Master.

The vessel cleared the berth at 0954 with the last of the flood tide and, after turning off the berth, the ship was brought round to a heading of 344° gyro towards No. 12 beacon. At 1004, sea speed was ordered.

The ship was equipped with two radar sets, one 3 cm, the other, 10 cm. The Third Mate used the 10 cm radar to fix positions at intervals of around ten minutes and the Pilot used the other set to verify the ship's track. The vessel was being steered by an experienced helmsman.

The Pilot followed his normal procedure of using parallel indexing off Heirisson Prong and Cape Heirisson, to navigate the vessel from a position off the berth to No. 12 beacon. Thereafter he intended to pilot visually as usual, past beacons No. 10 and No. 9, and finally through the narrow cut to exit Denham Channel.

As the passage outward proceeded, the Master and Pilot started to discuss the use of International Chamber of Shipping forms for the loading and discharging of bulk carriers, and a loading and discharging plan for *Pine Trust*. The Master provided the Pilot with copies of these forms as he had them available on the bridge. The Third Mate, who was on watch, plotted positions and monitored the ship's position in relation to courses laid on the chart.

At 1022, the Third Mate plotted a position on the chart close to the alteration point off Cape Heirisson. Shortly after this, the Pilot altered course to 318°, noting that No. 10 beacon lay fine to starboard. A few minutes later, he adjusted this course to 316° to counteract the effect of a wind, which he estimated was 25 knots from a direction SxE, and the tide. At this stage, the Pilot could not see beacon No. 9 from where he

stood because of intervening ship's structures, and because sea spray was limiting visibility.

At around 1030, the Master and Pilot changed their discussion from the use of ICS forms to a discussion on the new ISM documentation, and whether or not the ship had been provided with all ISM documents. The Master informed the Pilot that he was unable to provide him with copies, but he was able to show him forms that he had available.

While passing No. 12 beacon at around 1039, the Pilot checked the distance off by radar, and was satisfied that the vessel was close to the intended track. From this point, he resumed his normal practice of piloting the vessel by visual sightings of the beacons. The Pilot returned to his examination of the documents, occasionally glancing out to check on the vessel's progress relative to the position of the next beacon, which was No. 10.

At about 1045, the Pilot using binoculars, saw a beacon almost ahead and he adjusted the course from 316° to 314° to keep this beacon to starboard.

At 1050, the Third Mate plotted a position on the chart with No. 10 beacon abeam, about 4.5 cables to starboard. This position placed the vessel on the correct track.

At 1100, the Third Mate plotted the ship within 2.5 cables of beacon No. 9. The vessel was to the west of the intended track and about to pass No. 9 beacon to starboard, although this beacon was supposed to be passed to port when outbound. The ship's heading was 314° gyro, and the Master noted the speed was 11.5 knots by GPS. Just after 1100, the ship passed this beacon, close to starboard. Shortly after this, the Pilot located a beacon, which he took to be No. 9, fine on the port bow.

The Third Mate was concerned that the course was not being altered to pass No. 8 beacon to starboard, so he plotted a position on the chart, at a time recorded as 1111.

The Third Mate called the Pilot to the chartroom to show him the ship's plotted position. The Pilot initially did not accept this position was correct, believing the vessel was approaching beacon No. 9, and checked the beacon visually with binoculars. He also checked the radar display and realised that he had been mistaken, and that the ship was heading into danger. He ordered 20° of port rudder but, after the vessel

had swung through about 8°, *Pine Trust* ran aground on a heading of 307° gyro, with No. 8 beacon bearing 281° true, 2.6 cables off.

The Pilot requested zero pitch on the propeller, but was informed by the Master that there would be a delay. According to the ship's log book, the vessel grounded at 1120 and the engine was "stopped" at 1122.

Refloating of Pine Trust

After the grounding, the Pilot realising that the tide was falling, used the engine ahead and astern between 1123 and 1132 to free the vessel, but the attempts were unsuccessful.

The Master had called the Mate to the bridge, and instructed him to obtain soundings of all fresh water and ballast tanks and bilges, also to sound round the vessel externally, to determine the extent of grounding. The Master also instructed the Chief Engineer to sound all oil tanks.

The pilot boat was nearby and the Pilot and Mate used the boat to obtain draughts around the vessel. Soundings of tanks and bilges indicated that the hull was intact and, by examination of draughts and external soundings, it was determined that the vessel was aground between the stem and the after end of No. 4 hold.

The Pilot used a Public Works hydrographic plan, with greater detail than the navigation chart, which indicated that the vessel lay aground close to a rising bank on the starboard side.

The Pilot and Master agreed that a further attempt to free the vessel should be made near the time of the following high water at 2207 that night. From 2106 until 2312, the engine was run ahead and astern at full pitch in conjunction with full rudder to port and starboard, but this attempt was unsuccessful. The port anchor was used underfoot to determine whether there was any movement of the vessel ahead or astern.

Tidal predictions indicated that the next high water at around 1000 on 14 October, was likely to be higher, and between 0930 and 1124, with the port anchor underfoot, engine movements and helm were used, without success, to try and free the vessel. During this attempt, there was a change of heading of 5° but when the engine was used astern, the ship's head returned to 307°.

Further soundings taken on board and overside indicated that the hull was still intact. The Master then received instructions from the owners that no further attempts were to be made to free the vessel, and that he was to await the arrival of a Salvage Master.

After the Salvage Master arrived, his conclusions, based on an underwater inspection, were that the hull was intact, the rudder and propeller were undamaged, and that the hull was supported by the seabed from the bow to the aft end of No. 4 hold.

A tug arrived at the vessel at 0625 on
16 October and made fast through a centre lead astern, in preparation for an attempt to tow the vessel off around the time of the next high water.

That afternoon, at 1232, attempts were made to free the vessel with tug assistance and helm and engine movements. These attempts were also unsuccessful and, at 1450, the operation to free *Pine Trust* ceased.

A further attempt was made at 2130 on
16 October 1997. The port anchor was again lowered underfoot to detect movement of the vessel. With the use of the tug and ship's engine, the vessel was refloated at 2345. While refloating, the vessel lost the port anchor and all attached cable.

At 0018 on 17 October, the vessel was anchored using the starboard anchor and the tug cast off. The vessel shifted to a more secure anchorage at 0306 that morning, to permit an underwater inspection of the hull to be made, as well as an internal examination of certain areas.

There proved to be no damage to the hull and no pollution, and the vessel was able to resume her voyage to Japan.

Beacon No.9

Starboard View

View to starboard view obscured by mast and wheelhouse structure

Comment and Analysis

General

Pine Trust grounded off Beacon No. 8 in Denham Channel, when the vessel was outbound from Slope Island Terminal after loading a cargo of salt. No machinery or equipment failure contributed to the incident. There is no suggestion that the trim of the vessel, engine or steering failure, contributed to the accident.

Evidence

The ship's course was recorded by the course recorder trace, which was accurate ± 1 minute in terms of time, but was 6° high in error in heading.

The bridge "bell" book was maintained throughout the passage, but mainly recorded engine movements. The usual logbooks were also maintained, but these were completed after the incident.

The only record of the ship's passage was the chart, on which the Third Mate plotted the ship's position at intervals of about ten minutes.

Charts and corrections

The usual chart folios aboard *Pine Trust* are corrected from notices issued by the British Admiralty in weekly Notices to Mariners. Corrections to charts issued by the Australian Hydrographic Service of the Royal Australian Navy, issued in fortnightly Notices to Mariners are reproduced in the British Notices to Mariners.

In June 1996, *Pine Trust* was supplied with chart Aus 749, "Shark Bay, South Western Sheet", on a scale of 1:150,000, published by the Hydrographic Service, Royal Australian Navy. The current characteristics and numbers of the beacons in Denham Channel are shown on this chart.

In February 1997, the ship was supplied with a local chart DMH 661, “Shark Bay. Bellefin Flats - Denham”, issued in 1992 by the Department of Marine and Harbours, Western Australia, on a scale of 1:50,000, a chart not normally included in the ship’s folio. For navigation in the area of Denham Channel the scale of DMH 661 was preferred to the smaller scale of Aus 749. However, the ship’s copy of DMH 661 had not been corrected although the Department of Transport, Western Australia, had issued Notice No. 1 of 1996 on 3 January 1996, amending certain beacon numbers and adding light characteristics to beacons. It appears that the ship did not receive this notice when the chart was supplied.

There was a warning on Chart DMH 661in magenta print that there were “Restrictions on Use” of this chart, the restriction reading that “This chart is not corrected, prior to sale, for R.A.N. Hydrographic Office Notice to Mariners. Users are cautioned accordingly”.

No effort had been made by the ship’s staff to check that DMH 661was updated. As a result, the Third Mate was using an out of date numbering system and when he mentioned No. 10 beacon, he was in fact referring to No. 9 beacon. Although the Pilot stated that he was not in any way confused by this, in the Inspector’s opinion, this would have caused some confusion in the Third Mate’s mind, and possibly some loss of time when the Third Mate queried the Pilot at about 1111.

Had No. 9 beacon been shown as a starboard hand mark, it is possible that the Third Mate would have queried why the mark was being passed to starboard when the vessel was outbound.

Although the ship had not received the local notice issued by the West Australian Department of Transport, in January 1996, it would have been easy to compare chart DMH 661with Aus 749. The ship’s staff could also have used Admiralty List of Lights, Volume K, to update details of beacons in chart DMH 661.

The Pilot’s actions

There is no resident pilot at Shark Bay and the Slope Island terminal operators contracted with the present Pilot, who is resident elsewhere in Western Australia, to pilot ships to and from the terminal as necessary.

The Pilot had conducted *Pine Trust* to and from the terminal on two other occasions between June and the

ship's arrival on 12 October. He was also aware that *Pine Trust* called regularly at this terminal, noting that all officers had been on the ship previously and he assumed that they were familiar with the port and the approaches.

On 13 October 1997, the Pilot had awakened feeling sufficiently rested. While preparing to sail the ship he noted the information on pilot cards prepared by the vessel. The Second Mate had plotted courses outward from the terminal to the pilot station on chart DMH 661. The course on the chart was to the east of No. 9 beacon, leaving it to port on the outward passage. The Pilot agreed with these courses, but although the information on the chart relating to beacon numbers, lights and topmarks had been superceded, he did not correct the chart or call the Master's attention to the changes.

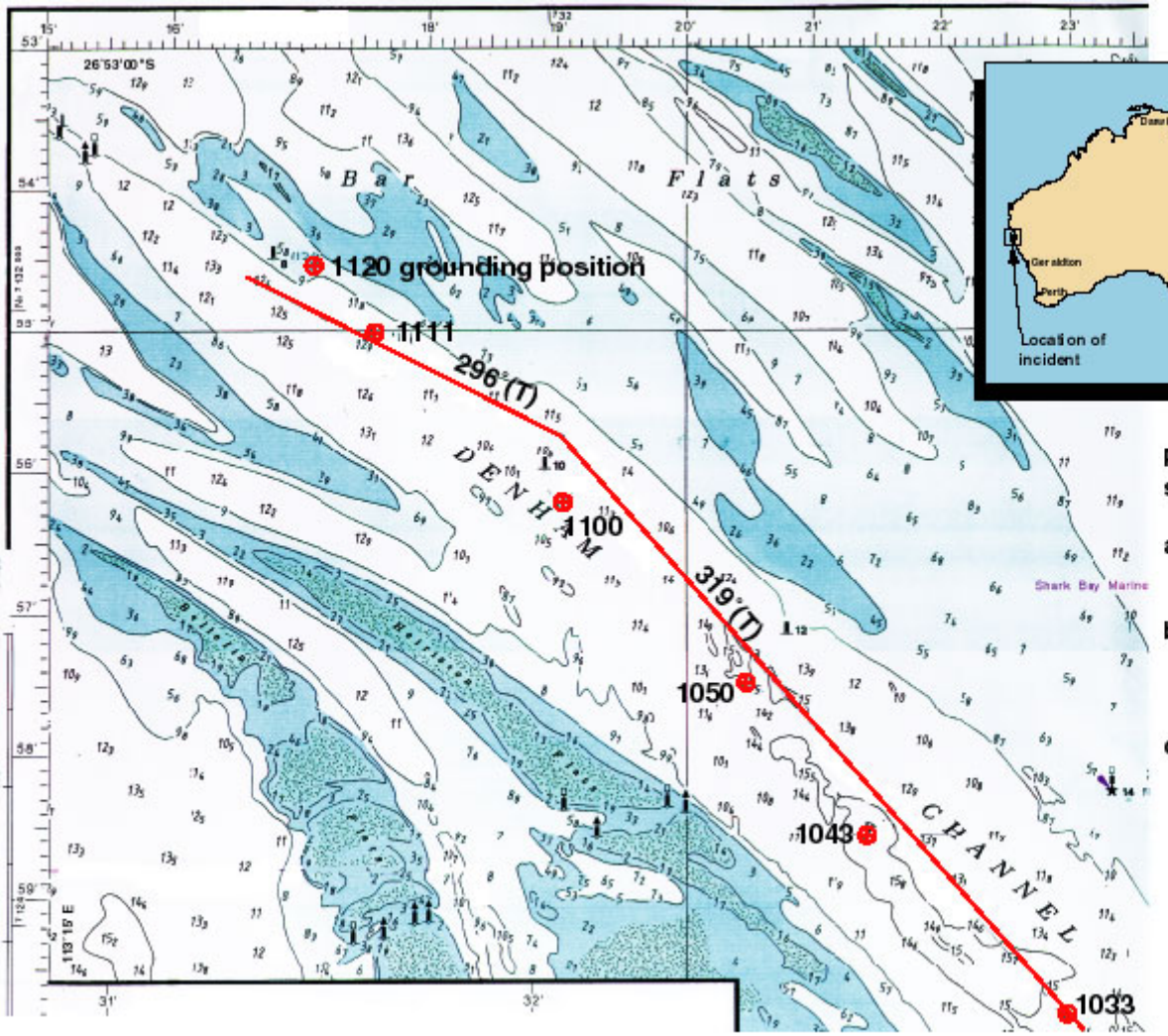
The Pilot gave no indication that he had planned any alternative route and did not discuss his outward passage plan with the Master or the Mates. It is also apparent that he had not predicted the times of passing each beacon.

The Pilot supervised the departure and, as the passage settled down and while approaching Cape Heirisson, the Pilot engaged the Master in discussions on the use of the International Chamber of Shipping forms and subsequently, the documentation relating to the International Safety Management Code.

The Pilot became distracted by his conversations with the Master and was preoccupied with various documents they were examining. He did not move around the wheelhouse frequently enough to negate the effects of blind sectors caused by the ship's cargo gear and mast arrangement. Later on, he totally lost track of time.

Critically, from where he was standing, to starboard of the centreline at the fore end of the bridge, his vision on the starboard side was obscured by the intervening mast and wheelhouse structure. However, he could see a beacon he knew was No. 10, fine on the starboard bow. At this time, No. 10 beacon would have been about 5 miles off, fine on the starboard bow. The ship, making about 11 knots would pass the beacon in a little under 30 minutes.

Just over 20 minutes later, at about 1045, the Pilot scanned the water ahead using binoculars and saw a beacon he assumed was No. 10 almost dead ahead. He adjusted the course from 316° to 314° in order to



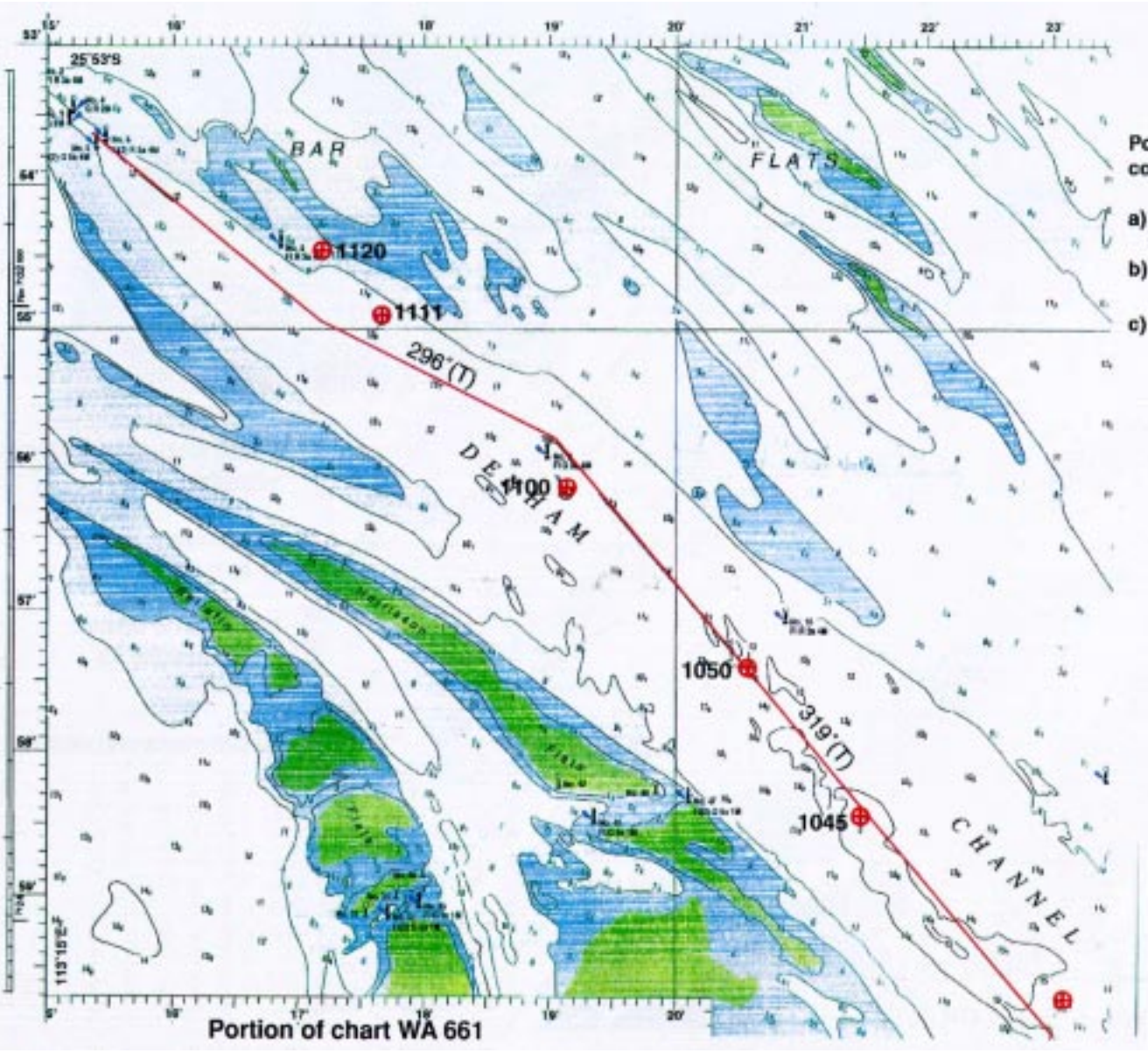
Portion of chart DMH 661 showing:

a) incorrect beacon numbers

b) beacons shown incorrectly as unlit

c) topmarks not shown

Portion of chart DMH 661



Portion of chart WA 661

Portion of chart WA 661 showing corrections to:

a) beacon numbers

b) lights on beacons

c) topmarks

pass it to starboard.

This beacon was in fact No. 9 beacon. No. 10 beacon, which he had correctly identified at 1022, would have been about 25° on the starboard bow at that time and obscured from somebody standing at the starboard side of the wheelhouse by the derrick post, which abutted the forward accommodation.

Thereafter, until the Third Mate challenged him some time after passing No. 9 beacon, he conducted his pilotage on the assumption that the ship was almost two miles, or ten minutes, astern of its real position. When challenged by the Third Mate midway between No. 9 and No. 8 beacons, he did not immediately accept the ship's reported position, but had to check it himself, losing valuable seconds in the process.

Shark Bay is surrounded by low lying land with limited features to act as a prompt for a person to assess an approximate position, or with which to relate the various navigation marks. Pilotage relied heavily on the beacon system and knowing which beacon was being passed. The Pilot however, did not make any conscious check of beacon numbers or characteristics to determine the position of the ship.

The distraction of examining and discussing the ICS and ISM documents led to a diminished level of concentration on the pilotage in hand. This, coupled with the absence of an adequate plan (outlining predicted times, passing distances, and the need for adequate communication between those on the bridge) for the Pilot and ship's staff, was a significant factor in the causal chain leading to the grounding.

The Master's actions

The Master was on the bridge from the time that the crew was standing by to sail the vessel, until the vessel ran aground.

About half an hour after leaving the berth, the Pilot and Master started to discuss and examine International Chamber of Shipping forms and documentation required by the International Safety Management Code.

Shortly after course was altered off Cape Heirisson, the Master recalled the Mate from the forecastle head to work out arrival draughts at the discharge port. He then resumed his discussions with the Pilot, interrupting the discussions to look forward from the starboard side of the wheelhouse and occasionally

checking the chart. The Master stated that the visibility was good, though sea spray made it difficult to readily identify beacons. He had not used the radar at all, and only referred to the GPS to check the vessel's speed.

Although the course as plotted lay east of No. 9 beacon, the Master stated at interview that he was aware, from a previous visit to Slope Island, that there was sufficient water on either side of the beacon, and he saw no problem with passing it to starboard. However, after passing No. 9 beacon he did not query the course steered, or the relative position of No. 8 beacon, which would have been fine to port instead of on the starboard bow. He was also not in a position to immediately support the Third Mate, when the latter reported his concern at the ship's 1111 position. Instead the Master went to the GPS receiver to check the speed.

The Master's actions and recollection of events are not consistent with him knowing the ship's position. It is probable that the Master had been distracted by his discussions with the Pilot, and had also lost track of the vessel's position.

The Third Mate's actions

The Third Mate was on the bridge for the vessel's departure from the terminal, and remained on watch until the vessel grounded.

He had rested from 0043 that day, till 0600, when he resumed his cargo watch. After completion of loading, he had gone to the bridge to prepare for departure, and after the vessel left the berth, he had plotted the ship's position on the chart at regular, ten minute intervals. When passing beacons the Third Mate made no report to the Master or Pilot and he had not been instructed to do so. Had such a system been in place, and had there been better communication between the navigator and the Master and Pilot, the grounding might have been prevented.

At 1050, the Third Mate plotted the ship's position as being abeam of and 4.2 cables off No. 10 beacon (No. 12 on the ship's chart). The ship at this time was at full sea speed making 11.1 knots and making good a course of about 314°.

He did not realise that the Pilot had missed seeing No. 10 beacon on the starboard beam at 1050, or that the adjustment of course the Pilot ordered at about 1045 was because the Pilot had mistaken No. 9 beacon for No. 10.

At 1100, he plotted a position with the vessel 2.5 cables off No. 9 beacon and about to pass it on the starboard side. At about this time the course of 316° was resumed.

After passing No. 9 beacon to starboard, the Third Mate realised that the vessel was heading towards No. 8 beacon. He established a position at 1111 and had drawn the attention of the Pilot to it. The Pilot, who still thought that they were approaching No. 9 beacon, stated that the beacon was supposed to be passed to port.

The Third Mate pointed out that they had already passed No. 9 beacon and the Pilot, who initially did not believe the Third Mate, checked the position. The Pilot then realised that the vessel was approaching shoal water, and according to the Third Mate, ordered the wheel put over, hard to port. The order was, however, too late to prevent the ship from grounding off beacon No. 8.

The Third Mate stated that he had plotted a position on the chart at 1111, and after this had drawn the Pilot into the chart room to show him this position. The Pilot could not recall the position being on the chart and felt that it was possible that it had been plotted after the grounding.

The Third Mate had consistently plotted the ship's position on seven occassions at intervals not greater than twelve minutes and not less than seven minutes. To plot a position at about 1111 would have been consistent with his routine to that time. However, the distance between 1100 and the 1111 plot relate better to a ten minute interval than to an eleven minute interval.

Regardless of whether the Third Mate plotted the position before or after challenging the Pilot, he was the only person on the bridge who knew the ship's position.

Bridge teams and Pilotage plans

Neither the Pilot nor the Ship's officers had received training in bridge resource management. *Pine Trust's* Safety Management System did not address procedures with a pilot on board, but the Master's order book

stated briefly that the Officer on watch had the responsibility to keep navigating, despite the presence of a pilot on board. The Third Mate adhered to this instruction.

There are two publications that it would be reasonable to expect any master and bridge team to use for guidance, the International Convention for Standards of Training, Certification and Watchkeeping for Seafarers 1974, and the International Chamber of Shipping, Bridge Procedures Guide.

Section A-VIII/2, Part 2 of the STCW Code outlines the requirements of voyage planning, which includes the provision:

"Prior to each voyage the master of every ship shall ensure that the intended route from the port of departure to the first port of call is planned using adequate and appropriate charts and other nautical publications necessary for the intended voyage, containing accurate, complete and up-to-date information regarding those navigational limitations and hazards which are of a permanent or predictable nature and which are relevant to the safe navigation of the ship."

With reference to Pilotage and Passage Planning, the ICS Bridge Procedures Guide states in Part A, Section 2.2:

The contribution which pilots make to the safety of navigation in confined waters and port approaches, of which they have up-to-date knowledge, requires no emphasis; but it should be stressed that responsibility for the ship's navigation is not transferred to the pilot and the officer of the watch retains all his duties.

After his arrival on board, the pilot, in addition to being advised by the master of the manoeuvring characteristics and basic details of the vessel for its present condition of loading, should indicate the passage plan he intends to follow. The general aim of the master should be to ensure that the plan is safe and the expertise of the pilot is fully supported by the ship's bridge personnel.

These two basic requirements were not met by the Pilot or the bridge staff.

Time of Grounding

The ship's logbook and bell book both record the time of grounding as 1120. However, the evidence is that the ship grounded seven minutes earlier, at 1113. The course recorder trace clearly suggests a time of about 1113. This is supported by an assessment of the ship's course and speed.

The position of grounding was close to No. 8 beacon, 2.4 miles from the 1100 position and 2.2 miles from No. 9 beacon. The vessel was on full sea speed at this time and had been maintaining a speed of over 11 knots. At 11 knots the ship would have covered the 2.4 miles in 13 minutes. If Pine Trust had grounded at 1120, it would have covered a distance of 3.7 miles and would have grounded close to No. 6 beacon.

Conclusions

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

Pine Trust grounded off Beacon No. 8, as a result of the course not being altered off Beacon No. 9 to pass safely through the line of beacons marking the narrow dredged passage at the head of Denham Channel.

The following factors are considered to have contributed to the grounding:

1. Lack of bridge team management processes in that:

(a) The Pilot did not communicate details of a passage plan to the ship's bridge team.

(b) There was insufficient communication between the ship's staff and Pilot in regard to progress of the vessel as various beacons were passed.

(c) The Third Mate did not draw the attention of the Master and the Pilot to a deviation from courses laid down.

Lack of adequate bridge management was compounded by

2. Inadequate monitoring by the Pilot of the position of the vessel, prior to passage of beacon No. 10, till the vessel grounded.

3. Loss of awareness by the Pilot of the vessel's position.

4. Inadequate monitoring of the vessel's position by the Master.

5. Loss of awareness by the Master of the vessel's position.

6. Chart corrections were not updated to indicate topmarks on certain beacons.

Submissions

Under sub-regulation 16(3) of the Navigation (Marine Casualty) Regulations, 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 the 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 relevant part thereof, was sent to the following:

The Pilot

The Master and Third Mate, *Pine Trust*

Australian Maritime Safety Authority

A written submission was received from the Pilot, and the report was amended as necessary.

In addition, the Pilot wrote that No. 9 beacon was previously marked as a port-hand beacon and portrayed as No. 10 beacon with all vessels passing west of it. However, several shallower patches to the west of No. 9 beacon and comparative deeper water to the immediate east of this beacon, determined that it should be redrawn as a starboard-hand beacon with consequent re-numbering of this and the other beacons to the south of it. Consequently, ships leaving the port with draughts approaching the port limit now pass to the east of No. 9 beacon.

He also wrote that Chart DMH 661is the chart provided by the Pilot to denote the intended ship's track for the majority of vessels calling at the port. However, *Pine Trust* being a regular caller at the port, maintains her own copy of this chart and has similar tracks to that on the pilot's chart drawn on it. Due to this and the fact that the Master had previously called at the port, the Pilot had not specifically discussed the pilotage plan with the Master.

Details of Pine Trust

IMO No.	7908938
Flag	Panama
Classification Society	Nippon Kaiji Kyokai
Ship type	Dry Cargo
Owner	World Trust Maritime Corp.
Year of build	1979
Builder	Uwajima Shipbuilding Co.Ltd.
Gross tonnage	13519
Net tonnage	8,157
Summer deadweight	22, 526 tonnes
Length overall	151.04 metres
Breadth moulded	26.04 metres
Draught (summer)	10.02 metres
Engine	Sulzer 6RD-68
Engine power	6032 kW
Crew	22 (21 Filipino, 1 Japanese)