# Departmental investigation into the grounding of the Singapore registered container ship NOL CRYSTAL in Moreton Bay, Queensland on 26 September 1997


## Report No. 124

## Depa

Australia
Department of Workplace Relations
and Small Business

# Contents



**Navigation Act 1912**

**Navigation (Marine Casualty) Regulations**

**the grounding of the Singapore registered container ship**

**NOL CRYSTAL**

**in Moreton Bay, Queensland on 26 September 1997**


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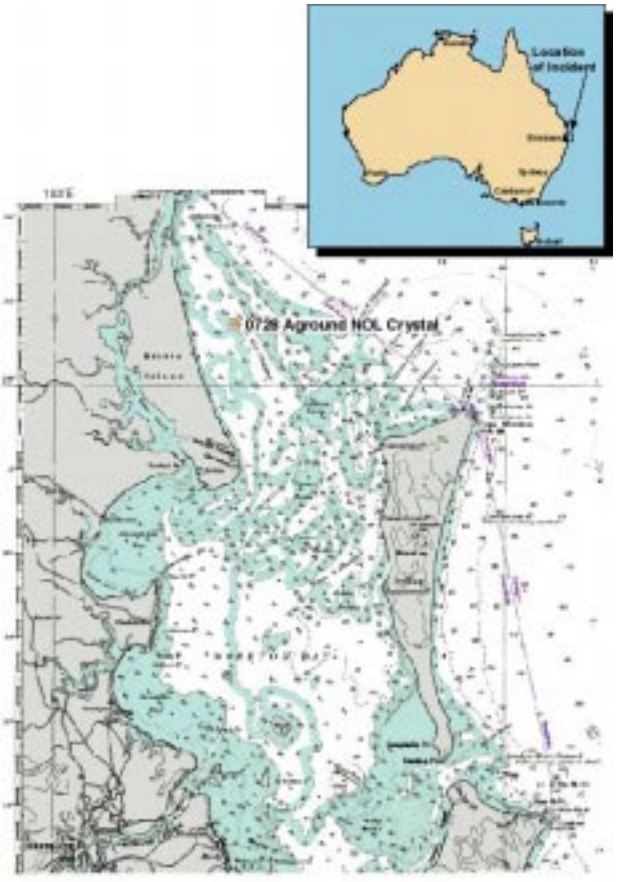
# Summary

The Singapore registered container vessel *NOL Crystal* sailed from Fisherman Islands container terminal at 0436 on 26 September 1997, at a maximum draught of 11.9 m, bound for Port Botany. The navigation was under the direction of a licensed pilot.

At the time of sailing, visibility was reduced to a little under one mile. As the vessel proceeded along Bar Reach, the visibility improved and speed was increased to full ahead.

The vessel navigated by way of East Channel, Main Channel and Spitfire Channel to North West Channel. VHF radio contact was made between *NOL Crystal* and a southbound car carrier and it was agreed the southbound ship, at a relatively shallow draft, would stay outside and to the west of the channel. After leaving Spitfire Channel, course was set to leave the next beacon (NW10) to starboard and an inbound ship was seen on the radar.




**Portion of chart Aus 364 showing location of incident**

At 0704, *NOL Crystal* passed NW10 beacon and, within a minute, entered a fog bank. The ship's speed was reduced and the ship's whistle sounded. A little later the whistle of the inbound ship could be heard as it passed clear to port. The fog was very thick.

At about 0715 as *NOL Crystal* passed NW3 beacon the Pilot altered the ship's course for the next leg of the channel. About four minutes later the Officer of the Watch told the Pilot that the ship was outside and to the east of the channel.

The Pilot could see that the vessel was slightly east of the transit of beacons NW8 and NW6. The Pilot ordered the engine revolutions to slow ahead followed by a bold alteration to port to bring the ship back into the channel. The Officer of the Watch then reported that the vessel was in the channel and the Pilot ordered an alteration of course to starboard. The ship was slow to respond and two minutes later the Officer of the Watch reported that the vessel was now outside the channel to the west and the Pilot ordered an increase in the helm angle.

The ship reached a heading of 300° and had started to turn to starboard when it grounded at about 0728 on a heading of 315°, in position 26° 56.3' South 153° 11.9' East, with NW8 beacon bearing 021° x 0.57 miles.

*NOL Crystal* refloated without assistance under its own power that afternoon at 1415. After ensuring that the vessel's watertight integrity was intact, the vessel was permitted to continue its voyage. Nobody was injured and no pollution resulted from the grounding.

# Sources of information

The Master and crew of *NOL Crystal*

The Pilot *NOL Crystal*

Brisbane Port Control

Brisbane Marine Pilots Pty Ltd

## Acknowledgment

The Inspector acknowledges the help and cooperation of the Queensland Department of Transport in the investigation of this casualty and the production of this report.

Portion of navigation chart Aus 364 and Aus 235 reproduced by permission of the Hydrographic Office, RAN.

# Narrative

## NOL Crystal

*NOL Crystal* is a Singapore registered cellular container ship, owned by Zephaniah Pte Ltd and managed by Neptune Shipmanagement Services (Pte) Ltd of Singapore. Launched as *Neptune Crystal* in 1979 in Japan, it is capable of carrying 2,316 twenty-foot equivalent units on deck and in its six holds. It is 234.0 m in length overall, has a breadth of 32.25 m, a moulded depth of 19.0 m and a summer draught of 12.526 m. The ship is powered by a 12-cylinder Sulzer diesel engine developing 29,570 kW giving a service speed of 24 knots.

*NOL Crystal* is a commercially operating container vessel, utilised as a cadet training vessel, maintaining a regular service between Malaysia, Singapore and Australian ports. The Master, officers, cadets and crew made up a total complement of 42 drawn from Singapore, Malaysia, India, China and Myanmar.

## The incident

*NOL Crystal* arrived at Fisherman Islands container terminal on 24 September 1997 on its regular voyage from Port Klang and Singapore to Australian ports.

At 0300 on 26 September, a ship's officer tested the navigation equipment, steering gear and bridge controls before sailing. *NOL Crystal* completed cargo operations at 0348 and the Pilot boarded at 0424. The ship sailed at 0436 and started the outward pilotage at a draught of 11.7 m forward and 11.9 m aft. Both steering gear motors were running.

The Master, Pilot, the Third Mate and three cadets formed the bridge team and one of the cadets was at the helm. The Master posted two lookouts forward. The visibility at the time of sailing was noted in the bridge logbook as being 0.8 miles. The vessel proceeded through the Bar Reach at reduced speed until visibility improved at about 0515 when the engine was put to full ahead.

The outward pilotage proceeded routinely. On passage between the Bar Reach and East Channel a tug, which was attempting to retrieve a tow, could be seen clearly at several miles. Brisbane Port Control contacted the ship to inform the Pilot of three inward bound ships, *Kota Hasil, Barrington* and *Automobil Ace*. As the vessel approached East Channel the Pilot and the others of the bridge team could see all the channel beacons, indicating visibility of at least four miles.

At 0603, *NOL Crystal* entered East Channel and at about 0610 passed the container ship *Kota Hasil* to port. VHF contact between the two Pilots established that *Kota Hasil* had experienced visibility of about 3 miles in the North West and Main Channels. The Pilot also made VHF radio contact with the tanker *Barrington* and the pilots agreed to pass port to port. As *NOL Crystal* continued through Main Channel, the bridge team could see what appeared to be fog banks to the west and to the east. Visibility in the channel itself was reasonable and the *NOL Crystal* and the southbound vessel *Barrington* passed each other.

At 0641, as the vessel approached Spitfire Channel, M1 beacon was covered by a fog bank but M2 beacon was clearly visible. At 0645, *NOL Crystal* entered Spitfire Channel and at about 0650 contact was made by VHF radio with the southbound *Automobil Ace.* The Pilots agreed that *Automobil Ace,* which was drawing 7.5 m of water and had sufficient depth of water outside the channel to the west, would leave the channel and allow plenty of room to pass port to port. Both vessels reported half a mile visibility.

*NOL Crystal* rounded NW12 beacon at 0653 and entered North West Channel coming to a course of 340°. The Pilot saw a white launch going in the same general direction, having crossed the dredged channel. The Pilot asked the Master to sound the whistle to ensure that the launch knew of *NOL Crystal's* approach. *NOL Crystal's* Pilot called *Automobil Ace* on VHF channel 12 and confirmed that the container ship was clear of Spitfire Channel on a course of 343°. He also stated that visibility had fallen to one hundred meters and that he was reducing speed. The Pilot on *Automobil Ace* responded, stating that his ship was leaving the channel to pass west of NW3 beacon and asking whether or not *NOL Crystal* had a small radar echo to the east of NW3 beacon. *NOL Crystal's* Pilot replied that he had no echo there at that time, and both Pilots exchanged information on the hull colour of their respective ships.

At about 0659, the Pilot on *Automobil Ace* contacted *NOL Crystal* stating that his ship was 1.5 miles from NW3 beacon steering 157° at 11 knots.

*NOL Crystal*'s whistle was switched to sound the fog signal automatically. The Pilot was at the outboard ARPA set, and the Master remained at the inboard ARPA set. The Pilot, who looked at chart Aus 235, saw no positions on it and asked the navigating officer to start fixing and plotting the ship's position by GPS as visibility reduced.

At 0704, the vessel passed NW10 beacon and the Third Mate plotted a position on the chart showing the ship was in mid- channel. The Pilot reduced speed from full ahead revolutions to half ahead and adjusted course to 350° to allow *Automobil Ace* more room. At about 0706 *Automobil Ace* confirmed it was passing west of NW3 beacon making good 11 knots on a course of 157°. *NOL Crystal* stated that it was coming to a course of 350°, reducing speed to eight knots and could now see the small echo close to NW3 on the ship's radar. About two minutes later the forward lookouts on *NOL Crystal* reported hearing a ship's whistle forward of the port bow, but there was no visual contact. The Master and Pilot tracked the passing ship on their respective radar sets. *NOL Crystal* confirmed on VHF that it was adjusting course to port to 345° and *Automobil Ace* replied shortly after, "I can hear you but I can't see you."

Five minutes later, at about 0713, the lookout on the port bridge wing on *NOL Crystal* reported hearing a foghorn on the port quarter. With *Automobil Ace* past and clear the Pilot ordered that the course of 340° should be resumed. He then defined an arc of 0.08 of a mile (about 150 m) off NW3 buoy as a passing distance.

At about 0715 *NOL Crystal* passed NW3 Beacon and the Pilot ordered an alteration of course to 330°. However, the bridge team did not see the beacon and they estimated the visibility as 40 m or less. At 0719, the Third Mate fixed the ship's position by GPS and reported that the ship was outside and to the east of the channel. The Pilot confirmed the ship's position relative to the channel by radar and could see the ship was slightly east of the transit of the eastern side channel beacons NW6 and NW8. The Third Mate took another position at 0721, which showed the vessel was still east of the channel. The Pilot assumed that the reason for the vessel being to the east was that a cross-channel tidal stream had affected the ship. He ordered a reduction in speed to slow ahead and an alteration of course to 300°. At 0724 the Third Mate informed the Pilot that, based on a GPS position, the vessel was in the channel and the Pilot ordered a resumption of course of 330°. However the vessel was slow to respond and continued to swing slowly to port.

At 0726, the Third Mate again fixed the ship's position by GPS and immediately reported that the ship was outside the channel to the west. The Pilot ordered full starboard rudder. The vessel steadied on about 300° and started to swing slowly to starboard. At about 0728, the Pilot ordered a reduction in engine revolutions to dead slow ahead and at almost the same time the vessel grounded forward. The ship grounded in position 26° 56.3' South 153°11.9' East, with the tide about 0.7m above datum. The engine was stopped with the ship heading 315°. The Pilot and Master estimated the visibility at the time of grounding to be between 20 and 30 m.

At 0730, the Master rang emergency stations. The officers and crew checked the integrity of the ship. Nobody was injured, there was no pollution and no ingress of water was reported.

At about 0733, the Pilot called Brisbane Port Control and asked them to plot his position and then to contact him by telephone. At 0740 telephone contact was made and the Pilot reported the grounding to Brisbane Port Control using a cellular phone. The Port authorities implemented their emergency procedures.

Between 0830 and 0915, the Master and Pilot made several attempts to refloat the vessel. None were successful and they suspended the attempts at 0919. The Master completed an emergency checklist and, satisfied that the ship was intact, those on board awaited the rising tide before a further attempt was made. At about 1030, the Queensland Tug & Salvage Co. Pty. Ltd., dispatched a tug to assist *NOL Crystal.*

At 1100, a Port Authority survey boat arrived at the ship and sounded the depth of water around the ship. At 1248, another licensed Pilot relieved the Pilot.

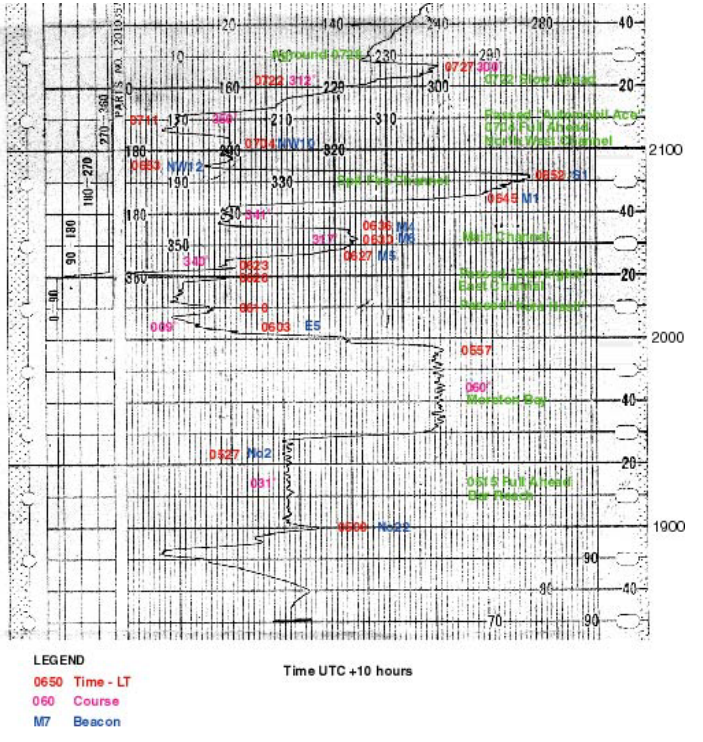
At 1406, with the tide at about 1.2 m above datum the ship refloated under its own power without assistance and was manoeuvred clear of the shoal. After the ship's staff had tested the engine and steering and found them to be operating properly, the vessel resumed the pilotage, disembarking the Pilot at 1656. With the Pilot clear, the ship stopped the engine and drifted while all systems were checked and a further check was made to ensure the hull's integrity had not been breached. With no ingress of water reported, the fuel oil tanks sound and the machinery working properly, the ship resumed passage for Sydney.

# Comment and analysis

## Evidence

*NOL Crystal* is equipped with a course recorder and automatic engine movement printout accurate to a half minute. The accuracy of the times shown on the course recorder appears to be within one minute of the times entered in the ship's bell book.

Brisbane Port Control has radar monitoring capability, but no system to capture radar pictures for analysis. Radio and telephone communications are recorded, although transmissions from the Harbour Control on channel 12 and the Pilot's hand-held VHF radios are not. The timing of the tape recordings seem to be between two and a half and three minutes slow of the times recorded aboard *NOL Crystal.*




**Annotated course recorder trace 0500-0728**

The evidence relating to this incident includes the above objective evidence, the ship's written bell book, logbook and charts. Material was also provided by the Pilot, in the form of his pilotage plan for 26 November, and by the Brisbane Port Authority. Interviews were conducted with relevant ship's staff and the Pilot.

The ship's equipment was checked as a part of the investigation. All equipment was found to be in proper working order. The gyro compass and slave units on the radars were found to be accurate.

While aground, the Port Authority survey launch *Jim Peel* checked the position of the ship's bow and stern by GPS. The position observed by the launch was consistent (within 100 m) with that recorded by the ship

at the bridge. The GPS was also checked in Botany Bay, alongside number 6 berth. It was found that the GPS position was 150 m south and about 60 m east of the ship's actual position in the berth. The evidence is that there was no marked error in the GPS read out and any discrepancy between the ship's receiver and the true position was not, in the Inspector's opinion, of such a magnitude as to have a material effect on the navigation of the ship.

The ship's speed over the ground, taken from charted positions varied according to the engine revolutions. Between E5 beacon and NW10 beacon the vessel was at full ahead revolutions and covered the 15.87 miles in 61 minutes at a speed of 15.6 knots. Between about 0705 and 0721, the ship was on half ahead revolutions and made good a distance of 3.2 miles at an average speed of 12 knots. From 0721 and the time of grounding the ship was at slow ahead (40 rpm), giving a harbour speed of 8 knots.

## Outward pilotage

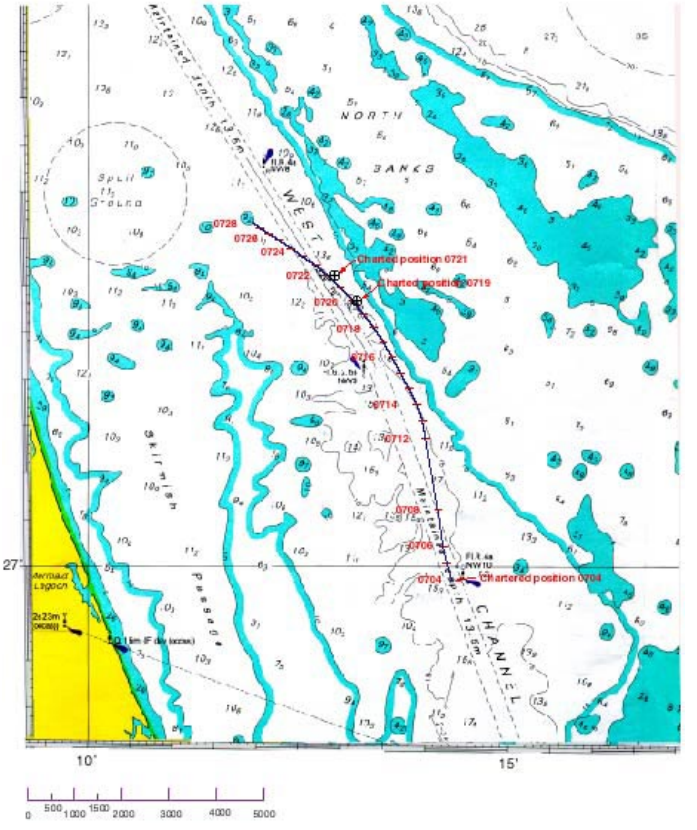
The pilotage from the berth to the beginning of North West Channel proceeded routinely. By the time the vessel reached East Channel it was full daylight, although banks of fog affected visibility.

At 0650, when *NOL Crystal* was in Spitfire Channel, about three minutes from NW12, the Pilot called the car carrier *Automobil Ace* as it was passing NW6 beacon. In responding to *NOL Crystal's* call the Pilot on *Automobil Ace* said that, as his ship was drawing only 7.5 m, he would go to the west of NW3, stay outside the deep water channel on the Bribie Island side and keep well clear of the northbound vessel. The two Pilots confirmed that each had about half a mile visibility. The tape of the radio conversation clearly records *Automobil Ace's* whistle sounding the fog signal.

On rounding NW12 beacon, the Pilot stated that he could see NW10 beacon ahead, 2.4 miles away, and a small pleasure craft crossing the channel. However, within a few minutes VHF contact between the two Pilots indicated visibility had fallen to 100 m.

In all, five separate VHF radio transmissions were exchanged between *NOL Crystal* and *Automobil Ace* as the two vessels approached and passed one another.

On passing NW10 beacon at 0704 and entering the fog bank all external prompts, which the Pilot normally relied upon, were lost to him. With visibility down to 40 m most of the deck forward would have been obscured. Although navigating by radar and intending to pass 0.08 of a mile off NW3 beacon, the Pilot had no practiced “blind pilotage” routine to fall back upon. Also, by altering to starboard for *Automobil Ace,* which was keeping well clear outside the channel, *NOL Crystal* left the channel and was essentially out of position for the alteration of course off NW3 beacon. There is also a tendency, unless the “blind pilotage” is properly planned, to alter course when a mark is closer to a beam bearing than when conning by eye and using external visual prompts.




**Portion of chart Aus 235 showing indicative course - NOL Crystal 0704 - 0728**
(based on course recorder trace and speeds estimated from chart position)

The channel is 300 m wide and between NW10 and NW3 beacons, the Pilot altered course to starboard from 340° to 350° to give the southward bound *Automobil Ace* more room. *NOL Crystal* was on a heading of 350° over a period of not less than six minutes. The ship’s average speed at half ahead over this time was not less than 12.5 knots and the distance travelled not less than 2300 m. The ship would have transferred about 400 m to the east of its original line of advance during this time. The extent to which the ship deviated outside the channel would depend on where the ship was relative to the axis of the channel at 0704. The Officer of the Watch fixed the position in mid-channel, but the Pilot stated that the ship was to the east of the axis of the channel.

Just after 0711, the ship turned steadily to port changing heading about 19° in three minutes. At 0714, the

vessel steadied for about one minute on 331° before an alteration of course at 0715 of two degrees over two minutes. Thereafter more helm was applied and the rate of turn increased to about three degrees per minute.

The Pilot stated that he put a clearing arc of 0.08 of a mile (150 m) around NW3 beacon, which marks the mid point of the channel. However, based on the courses steered from 0704, the ship would have passed outside this range, probably by a margin of at least 350 m.

When the ship's position outside the channel was reported to the Pilot at 0719 he was surprised and attributed the ship's position to the east of the channel to a cross-channel tidal set. The cautionary notes under the title of Chart Aus 235 states:

"Tidal stream and weather conditions continually change the channels and banks in Moreton Bay and Pumicestone Channel. The tidal stream sets across some channels and due caution is necessary."

After watching the radar transit of NW6 and NW8 beacons and assessing that there was no appreciable change in their transit, he ordered the speed reduced to slow ahead. He then ordered a "heavy" alteration of course to port. At this time NW8 beacon was 2300 m (just over 1.2 miles) ahead.

The tide was on the ebb, with low water at Caloundra at 1011. The tidal stream would have been to the north, tending to set *NOL Crystal* to the east side of the channel. While there may have been some cross-tidal stream, the reason the ship was out of position was the wide turn around NW3 beacon due to the alteration for *Automobil Ace* and disorientation in the fog.

The alteration to 300° at about 0722 was an over-correction. The untimed position marked after rounding NW3 and the positions plotted at 0719 and 0721 suggest that the ship would have regained the channel about 0.6 of a mile before NW8 beacon. The alteration in the transit bearings between the two beacons would have been slow and would barely have changed over the period of two minutes.

The alteration ordered when the ship had regained the channel was too late to prevent the 231 m long *NOL Crystal* from entering the shoal water to the west, where the dynamics of the loss of underkeel clearance would further affect the handling capabilities.

In fog “every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility.” The problem for pilots under such circumstances is that in slowing a ship the vessel’s handling characteristics alter in terms of rate of turn, altering either the wheel over positions or the amount of wheel used. The forward part of the ship was obscured by fog and all normal visual cues used for conning the vessel were lost to the Pilot. Without an effective blind pilotage plan the alteration around NW3 beacon could not accurately take into account the course alteration to 350° or the altered rate of turn.

## Pilotage plan

Brisbane Pilots provide the Master and bridge officers with a standard “Passage Plan”, indicating the tidal information, berths, tug usage and the channels to be used on passage to or from Brisbane Harbour. There is also a description of an inward and outward plan reproduced explaining the courses and channels followed for ships at various draughts.

The “Passage Plan” is really an information sheet for the ship’s bridge team. Other than general information it does not include clearing bearings, parallel indexing, turning arcs, wheel over positions or other pre-planned information, or the concept of interchange between visual and radar navigation.

## Ship organisation

For the pilotage passage from Brisbane, *NOL Crystal’s* bridge team was made up of the Master, the officer of the watch, a helmsman and the Pilot. In addition there was one cadet lookout on each bridge wing and two lookouts stationed forward.

The Company standing orders require the ship’s position to be fixed at certain time intervals depending upon the navigational circumstances, these intervals vary from 60 minutes in open ocean conditions to a 5 minute maximum interval in “critical” waters. At about 0700, when approaching the fog bank off NW10 beacon, the officer of the watch changed from chart Aus 236 to Aus 235. It was at this time that the Pilot looked at the chart and noted no positions had been put on the chart. In fact, the Third Mate, as officer of the watch fixed the ship’s position every three to four minutes while in the restricted channels, using visual bearings, radar bearings and radar distances. Soon after changing to chart Aus 235, the Pilot asked the

Third Mate to use GPS positions, as the Pilot was fully utilising one radar and the Master the other. The time of passing every beacon was recorded, except that of NW3, which was not seen visually by those on the bridge.

The position fixing by the officer of the watch met the Company standing orders and was far more frequent and efficient than normally found. The Third Mate had no hesitation in informing the Pilot that, based on the GPS position, the ship had left the channel at about 0719 and again at 0726. The Pilot was also told when the ship had regained the channel. The bridge organisation in terms of position plotting and passing information to the pilot was of a high order. However, chart positions are essentially historical records and by the time they are plotted, assimilated and acted upon, the ship has moved on. Under normal conditions, to plot a GPS position, measure, assimilate and act upon a ship's position would take at least a minute, during which time a ship at ten knots would travel over 300 m. Under fog conditions in confined waters such positions are of limited use in preventing a grounding.

The ship's navigating officers had not drawn up a passage plan of their own, identifying and involving marking the limits of safe navigation, giving clearing distances, bearings and parallel indexing distances.

## Restricted visibility – Moreton Bay

Fog in the month of September in Moreton Bay is a relatively rare event. Bureau of Meteorology statistics indicate that visibility of less than 1000 m is recorded at some time on 8.1 days in a year. This is usually radiation fog forming in low-lying areas close to the airport and drifting out over the Bay under certain circumstances. This fog does not extend far beyond the coast. The climatic tables in Australian Pilot Volume 3 records fog at Brisbane Airport as occurring on 2 days in every year. Brisbane Pilots, therefore, accumulate very little, if any experience in actual blind pilotage.

[1] Block Coefficient. The factor relating the volume of a ship's hull to that of a box of the same overall dimension.

# Under-keel clearance

*NOL Crystal* sailed at a draught of 11.7 m forward and 11.9 m aft. The ship has a block coefficient[1] fully loaded of 0.58 and the squat table[2] shows that the ship squat allowance at 10 knots is calculated as 0.58 m in open water

The minimum depth maintained in North West Channel is 13.5 m at Astronomical Low Water. Immediately north of NW3 beacon and to the east of the channel, depths of 15 m and more are found. Depths north of NW3, to the west of the channel, in the area traversed by *NOL Crystal,* are between 12m and 13m, with some areas below 12 meters.

High water at Caloundra Head was at 0432. At 0720, the tide was on the ebb and 0.7 m above datum giving a general depth immediately to the west of the channel of between 13.7 m and 12.7 m, reducing towards the 9.2 m shoal. As soon as *NOL Crystal* left the channel the under-keel clearance, allowing ten knots speed, would have been not more than
1.2 m and generally less.

With the reduced under-keel clearance, the hydrodynamic hull forces would significantly reduce the effect of the rudder when the ship was reported to the west of the channel at about 0724. The drift angle and rate of turn are both affected leading to a greatly increased turning circle and a reduction in the rate of turn.

[2] Squat – the tendency for a ship to sink lower in the water and change trim with forward speed, reducing the static under keel clearance.

# 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.

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

1. The fog conditions resulted in the loss of all normal visual marks and prompts.
2. The Pilot became disorientated in the fog.
3. The Pilot had no blind pilotage system to provide a seamless change in navigation procedures.
4. The alteration of course to clear the inbound ship at about 0710 resulted in the ship being out of position for the alteration of course off NW3 beacon.
5. In the absence of a full voyage plan and blind pilotage system, the Pilot overcorrected the ship's head to regain the channel after NW3 beacon.
6. The Pilot misjudged the return to the channel course and delayed the return to 328° until it was inevitable that the ship would enter the shallow water to the west of the channel.
7. The reduced under-keel clearance affected the handling charateristics of the ship, increasing the turning circle.
8. Once in conditions of restricted visibility, the lack of detailed outward passage plan by the ship's staff resulted in the potential for a "single person failure" to result in a grounding.
9. Although the ship's positions were fixed at frequent intervals, the positions provided a historical record of where the ship had been. In confined waters historical information is limited in its use to prevent a grounding.

It is further considered that:

10. Any discrepancy between the true position and that given by the GPS receiver was not of such a magnitude as to have affected the pilotage of the ship.

# 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 parts thereof, was sent to the Master of *NOL Crystal* and the Pilot.

No submission was received from the Master.

The Pilot made three brief comments, two of which have been addressed in the text of the report. The third comment related to pilotage planning.

"*I do not necessarily agree that the pilot was unaware of the situation and did not have a blind pilotage plan.*"

# Details of NOL Crystal

| | |
|---|---|
| **Former name** | Neptune Crystal |
| **IMO No.** | 7814838 |
| **Flag** | Singapore |
| **Classification Society** | American Bureau of Shipping |
| **Ship type** | Cellular Container |
| **Owner** | Zephaniah Pte Ltd |
| **Operator** | Neptune Shipmanagement Services |
| **Year of build** | 1980 |
| **Builder** | Ishikawajima-Harima Heavy Ind Co. |
| **Gross tonnage** | 33,113 |
| **Net tonnage** | 13,412 |
| **Summer deadweight** | 38,551 |
| **Length overall** | 230.99 m |
| **Breadth extreme** | 32.26 m |
| **Draught (summer)** | 12.526 m |
| **Engine** | Sulzer 12 RND 90 M |
| **Engine power** | 29,570 kW |
| **Crew** | 42 |