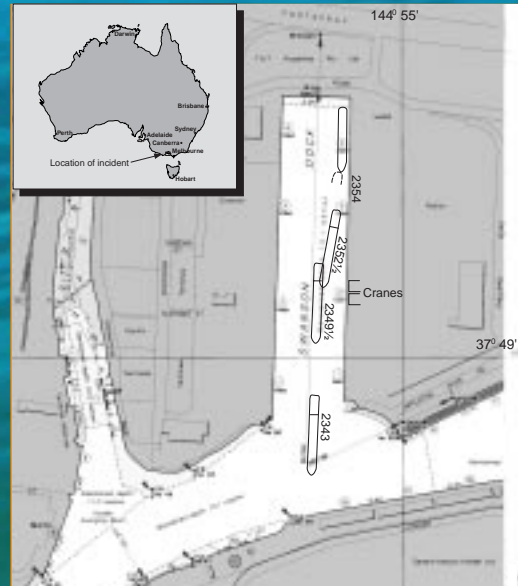


Incidents at sea

Departmental investigation into
the contact by the
Panamanian container ship
MSC KATIE
with the container ship
DL D SYDNEY
in Swanson Dock, Melbourne
on 18 June 1998



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ISBN 0 642 20015 7

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S ry

On the evening of 18 June 1998, the Panamanian flag container ship *MSC Katie* embarked a Port Phillip Sea Pilot off Port Phillip Heads to proceed to Swanson Dock, Melbourne. The vessel crossed Port Phillip Bay at full sea speed and reduced to slow speed for passage up the Yarra river. Three tugs were made fast when the vessel was in the vicinity of the Westgate bridge and the vessel arrived at the swinging basin, off the entrance to Swanson Dock at 2338.

The tugs swung the vessel to starboard so that it was positioned to enter Swanson Dock stern first and the Pilot manoeuvred the vessel slowly up the dock towards the allocated berth, No. 3 East. No vessels were berthed at Nos. 1 and 2 East. As the vessel's bridge cleared No. 2 berth, the aft tug eased the stern in, to angle the vessel towards the berth.

The Pilot ordered dead slow ahead, to bring the vessel to a stop, but the engine failed to start. The starboard anchor was let go and the tugs took the weight to stop the vessel and to pull it away from the berth, but the port quarter of *MSC Katie* made contact with the stem of *P&O Nedlloyd Sydney*, berthed at No. 4 East. Both vessels sustained relatively minor damage.

After *MSC Katie* was safely moored alongside, the reason for the engine failure was traced to a blocked pipe to the main bearing lubricating oil pressure gauge/safety switch. This had created a spurious lubricating oil low pressure reading, which had initiated an emergency trip of the main engine, causing the fuel pumps to lift and preventing the supply of fuel to the engine.

S **c** **f** **for** **t** **n**

Master, Chief Engineer and Pilot, *MSC Katie*

Tug Masters, *Keera, Sprightly* and *Corsair*

Control Tower, Port of Melbourne

Melbourne Mooring Services

R L Wright & Associates Pty Ltd, Balaclava

Australian Maritime Safety Authority, Melbourne

Acknowledgement

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Na tiv

MSC Katie is a 2556 TEU container ship, owned by Chimete Investments Inc. of Panama and operated by Mediterranean Shipping Company of Geneva on a liner trade between North Sea, South African and Australian ports. Built as the *Oriental Executive* at the Cons. Nav. & Ind. de la Mediterranee (CNIM) yard at La Seyne, Southern France in 1977, the vessel was lengthened at the Hyundai Mipo Dkyd Co. Ltd, yard, at Ulsan, Korea in 1981. The vessel has an overall length of 252.19 m, a beam of 30.5 m and a summer draught of 10.89 m. Main propulsion is provided by a single, 9 cylinder, 21,780 kW Sulzer diesel engine, driving a single, fixed-pitch propeller, providing a service speed of 19.5 knots.

The vessel is manned by a conventional style crew of 30, comprised of Italian deck officers, a Croatian radio officer, Yugoslav engineer officers and a mixture of Italian, Yugoslav, Croatian and Indonesian ratings.

MSC Katie arrived off Port Phillip Heads, bound for Melbourne, at 1948 on 18 June 1998 and embarked a Port Phillip Sea Pilot at 2000 for passage to its assigned berth, No. 3 East Swanson Dock. The Pilot discussed the entry plan with the bridge team and, as the draught was only 9.5 m, he requested full sea speed. The vessel entered between the Heads at 2012 and cleared the South Channel at 2115.

Speed was reduced to manoeuvring full ahead approaching Fawkner beacon, which was passed at 2228 and the Pilot reduced the speed to slow ahead as the vessel approached the breakwater. Due to the length of the vessel the Pilot proceeded up the river with the engine on dead slow ahead.

The ship's bridge team for the passage up the river consisted of the Master, the Mate, the Radio Officer (who operated the engine control and wrote up the Bell Book) and a seaman at the wheel. The engine room team consisted of the Chief and 3rd Engineers, the Electrician and an oiler.

The engine was stopped from 2313 to 2316, while the tug *Sprightly*, a conventional type, twin screw tug, was made fast forward, using the tug's line "on the hook". *MSC Katie* passed under the Westgate bridge immediately afterwards. The "z-peller" type, twin screw tug *Keera* then made fast on the starboard quarter and the conventional type, twin screw tug *Corsair* made fast on the starboard shoulder, both tugs "lashing up" on a short bow line. With all the tugs made fast, the Pilot only used the engine for short periods at a

time, on dead slow ahead, so as to maintain steerage way.

At 2330, the Pilot received information about the berthing position from the Dock. The vessel was to berth port side alongside, the stern would be 50 m from the vessel on No. 4 berth and the bow would be 20 m from the cranes, which had been moved clear, to the north end of No. 2 berth.

The vessel arrived at the swinging basin, at the entrance to Swanson Dock, at 2338 and the Pilot directed the tugs to swing the vessel around to starboard, to align it for stern entry into the dock. This was achieved at 2343 and the Pilot ordered slow astern, to start the entry into the dock, then ordered stop engines after about one minute, when he was satisfied with the way astern. There were no vessels alongside Nos. 1 and 2 berths, so the Pilot, stationed on the port bridge wing, maintained *MSC Katie* at a distance of about 50-60 m off the wharf. He again ordered slow astern, then reduced to dead slow astern, to maintain a slow movement, of about 2 knots, up the dock. The wind was light (6 knots) from the north and the Pilot did not anticipate any difficulties.

After the swing had been completed, *Sprightly* had moved to a position on *MSC Katie's* starboard bow, headed up the dock, and was moving up the dock on a slack line.

When the ship's bridge was in line with the cranes, at the north end of No. 2 berth, the Pilot instructed *Keera* to push up easy, to angle the stern in towards the berth. The mooring boat then moved in and ran a stern line ashore from the starboard lead aft.

Shortly afterwards, when the stern was about 200 m from the ship astern, *P&O Nedlloyd Sydney*, the pilot ordered dead slow ahead, to bring the vessel to a stop. Still stationed on the port bridge wing, the Pilot realised that the movement astern was not decreasing and, looking over the side, he saw that there was no water disturbance under the stern. He remarked on the fact to the Mate, standing close by, ordered slow ahead and instructed *Sprightly*, which had moved into position to "hold off", to take some weight on the bow, as he was not getting any engine movement. The engine then "coughed" for a few seconds, then became quiet, so the Pilot instructed *Sprightly* to take the weight, ordered the Mate to "give her all you've got" and instructed *Keera* and *Corsair* to come "full astern off the other ship".

When the Radio Officer had put the engine control to dead slow ahead, the engine turned over on air, but did not fire on fuel. Alarms sounded in the engine control room and a red warning light came on, indicating “low lub oil pressure” and “emergency trip”. The engine control system automatically tried two further starts on the engine, during which time the Chief Engineer checked the lubricating oil pressure gauge and pump load, both of which showed correct readings. He then tried to reset the emergency stop unit, but was unable to do so and he checked the function of the remote control unit. The telegraph moved to slow ahead, so the Chief Engineer changed the system over to engine room control and tried to start the engine from the control room, turning the engine over on air until the air low pressure alarm sounded. He then telephoned the bridge and informed the Master that the engine could not be started. This was at the same time as the Pilot called for “all you’ve got”.

The Master relayed the Chief Engineer’s message, through the Mate, to the Pilot, who gave orders for the starboard anchor to be let go. At this stage, the stern was about in line with the bridge position marker on the wharf and about 100 m from the bow of *P&O Nedlloyd Sydney*.

MSC Katie continued to move slowly astern and started to move off the berth. However, as *Keera* put full weight on its tow line, the sacrificial tail* parted, at the point where it passed through the tug’s forward lead. The stern line which had been put ashore in effect became a spring which, combined with *Sprightly* pulling full weight, slowed the astern movement, but then that line also parted. Very shortly afterwards, the port quarter came in contact with the bow of *P&O Nedlloyd Sydney*.

The headline moorings of *P&O Nedlloyd Sydney* were on tension winches which, as the weight came on the lines, paid out more line, thus cushioning the contact to some extent. The taut headlines then had a spring effect and, after coming to a stop, *MSC Katie* surged forward about 10 m. *Keera* and *Corsair* then eased *MSC Katie* alongside the wharf, after which *Sprightly* pulled the ship forward into the correct position. The vessel was all fast alongside the berth at 0022.

After the vessel was secured alongside, the Chief Engineer investigated the cause of the engine failure. As all ancillary machinery was operating correctly and, as the emergency trip can only be activated by three

* a grommet made up of a length of smaller diameter rope, attached to the end of the main tow line, which is lighter and therefore easier to handle and place on the bitts.

situations, he believed the trouble lay in a safety control failure in the lubricating oil system to the main bearings. The main bearings are protected by a pressure switch which, if the lubricating oil pressure drops to 2 kg, transmits a signal to the solenoid valves on the fuel pumps, lifting the pumps and stopping the supply of fuel to the engine. The Chief Engineer disconnected the small bore (6 mm) pipe to the safety control switch and, instead of flowing freely, the oil that came out did so in spasmodic spurts and was of a heavier viscosity than normal, indicating a blockage. After a while, the oil did flow freely, indicating the blockage had cleared. Before the ship sailed from Melbourne, the lubricating oil pipe was disconnected, blown through with air to ensure that it was clear, then pressure tested in the presence of a Class surveyor. The ship experienced no further problems with starting the main engine during and after departure from Melbourne.

MSC Katie sustained damage to the shell and deck plating right aft on the port quarter, also to deck fittings and to container support pillars and access platform in that area. *P&O Nedlloyd Sydney* sustained scratching and indentations on the stem plating, plus a 280 mm vertical fracture in the plating and damage to the gangway, which came in contact with a bollard on the wharf as the ship was pushed astern.



MSC Katie damage to port quarter



P & O Nedlloyd Sydney damage to bow

Conduct Analysis

Although the Master had not stopped and tested the engine astern prior to the vessel's arrival at the pilot station, he did stop the engine just prior to the pilot launch arriving alongside to deliver the pilot on board. The engine was also stopped six times during the passage up the river and during the manoeuvring into Swanson Dock, and each time had started again without any problem. There had been nothing to indicate to those on the bridge that the engine would not start as needed. The Pilot was, therefore, placed in an unenviable position when the engine failed to start and to run at dead slow ahead to, as he anticipated, bring the vessel to a stop, in position, at the berth.

Engine failure

Shortly after the incident, the Chief Engineer identified the cause of the engine failing to start as a false lubricating oil low pressure signal, which activated a main engine stop. The ship's staff rectified the problem before the ship sailed.

At the time of the incident, the Chief Engineer checked the oil filters, which are of the automatic, self-cleaning type, and there was no pressure difference across the filter, indicating that it was clean. The engineers' work-book showed that the filters had been opened up for inspection on 9 June, just nine days before the incident and the oil purifier in use at the time had been cleaned on 12/13 June. However, there is no laid down maintenance schedule for checking the supply lines to pressure switches and the indications are that it is not the practice to do so. Had there been a regime in place, perhaps at drydockings, for blowing through these lines, the incident may well have been avoided.

Speed of approach

The Pilot stated that, because of the size of *MSC Katie*, he took his time and proceeded at very slow speed. After the vessel had been swung in the swinging basin, it would have been virtually stopped; if anything, there may have been a slight residual ahead movement. The pilot used the engine at slow astern for one minute, stopped the engine for two minutes, used it again at slow astern for another minute, then reduced to dead slow astern for four minutes. He considered the speed to have been at the maximum two

knots. When he ordered dead slow ahead, the engine had been stopped for about one minute.

The Masters of the three tugs all considered that the approach speed was normal for the size of vessel. Reconstruction of the incident indicates a speed of approach to the berth of about 2.15 knots (66.4 m/min), at which speed the vessel should be quite readily stopped.

Approach procedure

The Pilot adopted the usual approach to the berth for when there is no vessel on No. 2 berth, angling the vessel in towards the wharf as soon as the accommodation block is clear of the container cranes. However, this procedure, although routine, reduces the margin for error, greatly reducing the area available in which to regain control in the event of engine failure.

The first line sent ashore was a stern line, from the starboard quarter. Although this line in effect eventually became a spring, when it did so it passed around the hard, 90° corner of the transom stern and parted. Had a spring line been sent ashore first, not only would the lead have been correct, it could have been used to check the movement astern much earlier and may have helped to prevent the contact with *P&O Nedlloyd Sydney*.

As soon as he realised that something was wrong, the Pilot instructed the tug *Sprightly* to take the weight, but *Sprightly*, which was positioned for “holding off”, first had to move into position ahead of *MSC Katie* before being fully effective. Where three tugs are employed, it should be possible for the bow tug to take up a precautionary “braking” position for the final approach. Normally, either one or two “z-peller” type tugs (*Gabo* and *Keera*) are employed, “lashed up” alongside, therefore it would be appropriate for their optimum braking manoeuvre in such situations to be assessed.

MSC Katie's transom stern came in square contact with *P&O Nedlloyd Sydney*'s stem and some of the impact was absorbed by *P&O Nedlloyd Sydney* moving astern. Had *Keera*'s tow line not parted, and *MSC Katie* had been pulled a little further off the wharf, the hard corner of the transom may have come in contact with *P&O Nedlloyd Sydney*'s starboard bow plating. That would probably have resulted in greater damage being inflicted, particularly on *P&O Nedlloyd Sydney*.

The Pilot gave an order for the starboard anchor to be let go, but at that point it was too late to be of benefit. Unless the warning to the pilot of an engine failure is timely, and unless specific instructions are given to the forecandle party as to how much cable is to be paid out before holding on, the effectiveness of using anchors is minimised.

During the period 1 January 1994 to 12 August 1997, there were 76 recorded incidents of engine failure in Port Phillip Bay, Melbourne and Geelong, on average one incident every 2½ weeks. More than half of these occurred in port, as against Bay, areas, but fortunately were generally in areas where the tugs were able to keep the vessels under control. Although this number is only a very small proportion of the total number of vessels visiting the area, it is high enough to highlight the need for contingency planning to be included in the berthing plan* .

Shipboard management/communications

Comparison of the times recorded on board, recorded to the nearest minute, and those recorded by the Port of Melbourne Control Tower indicate that the ship's clocks were 1½-2 minutes fast on that of the Control Tower recording equipment. This has been taken into account when determining time lapses.

At interview, the Chief Engineer stated that the “low lub oil pressure” alarm occurred when the bridge engine control was placed at dead slow ahead. However, the data log print-out indicates that this alarm occurred when the engine was stopped, one minute before the engine control was set to dead slow ahead. Thus there were already indications of a major problem having developed, before the ahead movement was ordered.

When the “low lub oil pressure” alarm activated the main engine trip, an “emergency shut down” alarm and red warning light would have been activated on the bridge console. This alarm would have had to have been acknowledged by someone on the bridge. However, at a time when the vessel was approaching a critical stage in the approach to the berth, there was no communication between the bridge and the engine room teams, to pass information about the situation.

* see section 2.6.3, bridge Procedures Guide, Third edition 1998 (International Chamber of Shipping)

Both the Master and the Radio Officer were stationed in the wheelhouse, yet neither of them notified the Pilot when the main engine emergency shut down alarm sounded, or when the engine failed to start after he had ordered dead slow ahead. In fact it was not the practice on board for a pilot to be informed of the engine's response to a telegraph order.

The cycle for the three programmed start attempts is about 30 seconds, while the time recorded for the slow ahead was one minute after that for the dead slow ahead. The data log time for the "air low pressure" alarm was the same as the time logged for the slow ahead order, however, this can be accounted for by times only being recorded to the nearest minute. It was then about a further half minute after the order for slow ahead before the Chief Engineer had informed the Master that the engine could not be started and the Master had relayed the information to the Pilot. Thus, at a critical stage in the operation, there was a delay of between two and two and a half minutes in the Pilot being informed, from the time of the initial indication of a major problem.

Communication is vital for safe and smooth operations. When manoeuvring in port it is important for those on the bridge to keep the engine room staff informed of progress. If, at the time the engine was stopped at 2352, the Chief Engineer had been informed that the vessel was approaching the berth, he might have been prompted to inform the bridge at that time about the possible ramifications of the engine "emergency trip" alarm.

The Pilot discussed the entry procedure with the Master before proceeding with the pilotage. However, it is apparent that the berthing operation could not have been discussed in detail, although there was ample time to do this on the passage up the Bay. With a vessel known to be on No. 4 berth, a prudent master could be expected to have raised the issue of the first lines to be run ashore, with the situation indicating a spring aft as the first line ashore, followed by a headline, to check movement astern.

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

- The engine failure was caused by blockage of lubricating oil piping to a pressure safety switch, which caused a “low pressure” alarm, which in turn initiated a main engine emergency trip mode, which prevented the engine being started. There are no engine manufacturers’ instructions or recommendations on periodic checking of such piping and it is not standard practice on board ships for such checking to be carried out.
- The lack of communications between the bridge and engine room teams, resulted in the bridge team not keeping the engine room team informed of progress; and the engine room team not immediately informing the bridge team about possible ramifications of the engine “emergency trip” alarm.
- The lack of Bridge Resource Management principles on board, resulted in the members of the ship’s bridge team not informing the Pilot about the main engine emergency trip and did not keeping the Pilot informed about engine response.
- The absence of a safety assessment of, and contingency planning for, the berthing operation, plus an absence of detailed discussion of the berthing operation. In addition there was an absence of sufficiently detailed discussion of the berthing operation under Bridge Resource Management principles. As a result, no suitable lines were ashore to check the movement astern and, during the final approach to the berth, the bow tug was not in the optimum position to stop the vessel’s movement astern, thus there were no safety barriers in place.

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 parts of the report, was sent to the following:

Master, Chief Engineer, *MSC Katie*

Mediterranean Shipping Company, Geneva

Pilot

Port Phillip Sea Pilots P/L, Safety Committee

The Pilot telephoned the Inspector and informed him that he had no substantive comment to make on the report. He made the point that he had piloted *MSC Katie* on its previous visit to Melbourne and he had not experienced any problems on that occasion. He also stated that at the time of the incident the vessel was too far off the wharf to send ashore headlines.

details**f 'M C KATI '**

IMO No.	7434444
Former names	Oriental Executive, OOCL Executive
Flag	Panamanian
Classification Society	American Bureau of Shipping
Ship type	Container ship
Owner	Chimete Investment Inc. Panama
Manager/Operator	Mediterranean Shipping Co, Geneva
Year of build	1977, lengthened 1981
Builder	Cons. Nav. & Ind. de la Mediterranee, La Seyne, France
Gross tonnage	35 599
Net tonnage	12 930
Deadweight	38 743 tonnes
Length overall	252.19 m
Beam	30.5 m
Summer draught	10.89 m
Main engine	9 cylinder Sulzer diesel
Engine power	21 780 kW
Crew	30