MARINE OCCURRENCE REPORT
M98W0019

CONTACT WITH BOTTOM

BY BULK CARRIER “PACIFIC DOLPHIN”
AND TUG “SEASPAN FALCON”
PORT MOODY, BRITISH COLUMBIA
15 FEBRUARY 1998

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

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Summary

The "PACIFIC DOLPHIN", under the conduct of a British Columbia Coast Pilot and assisted by two tugs, was moving from anchorage "L" in Indian Arm to a terminal in Port Moody, B.C. As the vessel attempted to round Admiralty Point, the tug "SEASPAN FALCON", which was on the vessel's port bow, was pushed towards the shore and grounded briefly. Shortly afterwards the "PACIFIC DOLPHIN" also made contact with the bottom. The pilot regained control of the "PACIFIC DOLPHIN" and, without further incident, berthed the vessel port side to Pacific Coast Terminal No. 2 wharf in Port Moody. The "PACIFIC DOLPHIN" and the "SEASPAN FALCON" each sustained damage to the bottom shell plating. No pollution was observed.

Factual Information

	"PACIFIC DOLPHIN"	"SEASPAN FALCON"
Port of Registry	Monrovia, Liberia	Vancouver, B.C.
Flag	Liberia	Canada
Registry/Licence Number	10492	816602
Type	Bulk carrier	Tug
Gross Tons	27,763	188.77
Length	189.99 m[1]	24.38 m
Draught	6.65 m	1.25 m
Built	1996, Oshima, Japan	1993, Vancouver, B.C.
Propulsion	Diesel, 9041 BHP	2 Z-drives. Diesel 3200 HP
Number of Crew	31	2
Registered Owners	Mingwah Shipping Co. Hong Kong	Seaspan International Ltd. North Vancouver, B.C.

The "PACIFIC DOLPHIN" is a bulk carrier with five hatches and four deck cranes. The wheel-house, machinery and accommodations are all housed in one superstructure located at the after end of the vessel.

The wheel-house has an open layout. The steering console is located amidships and the chart table behind it. To starboard of the steering console are two radars, one of which is equipped with Automatic Radar Plotting Aid (ARPA) functions.

The propulsion machinery of the "PACIFIC DOLPHIN" consists of one reversible main engine, driving one right-handed, fixed-pitch propeller. It is fully manoeuvrable from the wheel-house by means of one lever controlling both the direction and the revolutions per minute (RPM) of the propeller.

The clock, vessel log, rudder angle and RPM indicators are mounted on the bridge-front bulkhead, forward of the steering console. An additional rudder indicator is located on each bridge wing.

[1] Units of measurement in this report conform to International Maritime Organization (IMO) standards or, where there is no such standard, are expressed in the International System (SI) of units.

On 12 February 1998, after a passage from Japan, the "PACIFIC DOLPHIN" arrived at the pilot station off Victoria, B.C. , where a pilot boarded. The vessel arrived at anchorage "L" in Port Moody, at 0800[2] to await a berth. The port anchor was deployed with six shackles (approx. 150 m) of chain in a position 49°18'N, 122°56'W, approximately three cables west-north-west of Admiralty Point where the depth of water is about 18 m. The vessel's stern was free to swing within a maximum radius of about 300 m from the anchor.

On 15 February at 0545, a B.C. Coast Pilot boarded the "PACIFIC DOLPHIN". Two tugs arrived at the vessel's side to assist in moving her to the Pacific Coast Terminal No. 2 , approximately three miles from anchorage "L". All relevant equipment and propulsion machinery was tested by the crew and found to be in good working order. A junior deck officer and a deck-hand were in the wheel-house when the pilot arrived; approximately one minute later the master came to the wheel-house. The "SEASPAN HAWK" took up a position aft and the "SEASPAN FALCON" went on the starboard bow of the "PACIFIC DOLPHIN".

Upon arrival the pilot checked the gyro-repeater and found that the heading was approximately 230° and the gyro-compass appeared to have no error. Neither the master nor any other crew member noted the vessel's heading at that time. The skippers of the two assisting tugs reported that upon arrival at the vessel's side, the "PACIFIC DOLPHIN" was lying on a south-westerly heading.

The master gave the pilot the Pilot Card with the vessel's particulars and manoeuvring characteristics. The pilot informed the master about the sequence of manoeuvres he was planning to execute; to leave the anchorage and to shift the vessel to the terminal. The pilot planned to swing the vessel to port from her heading of 230° and, as soon as the anchor was aweigh, to reach and proceed upon a new heading of 140°(T&G).

Reportedly, the pilot received from the master all the necessary information and, while leaving the anchorage, the master and the crew effectively participated in the handling of the vessel and kept the pilot apprised. Pilot's orders and the reports from the mate on the vessel's bow were translated and relayed by the master.

At 0550 the chief officer on the bow carried out the order to commence heaving the anchor. At 0608 the pilot received information from the "SEASPAN FALCON" that the anchor was surfacing. The pilot ordered slow ahead on the engine. The order was executed and logged in the vessel's bell-book. At the same time the pilot ordered the "SEASPAN FALCON" to push on the starboard bow of the "PACIFIC DOLPHIN".

The "PACIFIC DOLPHIN" was swinging to port and had reached a heading of approximately 180° when the pilot ordered the "SEASPAN FALCON" to stop pushing and to move to the vessel's port bow. With the "PACIFIC DOLPHIN" lined up on a heading of 140°(T&G), the pilot

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[2] All times are PST (Coordinated Universal Time minus eight hours) unless otherwise noted.

ordered the rudder hard-to-starboard and the tug to push on the port bow to arrest any further swing. When the "SEASPAN FALCON" began pushing at about 0614, the pilot called for more power from the tug . The tug's skipper responded that his vessel had grounded off Admiralty Point.

The "PACIFIC DOLPHIN" was moving slowly ahead with Admiralty Point close on the port side. The pilot ordered the rudder hard-to-port to swing the stern away from the land. When the mid-length of the vessel was abeam of the grounded tug, the latter managed to float free and to resume pushing. At 0615, those in the wheel-house of the "PACIFIC DOLPHIN" felt a vibration of the hull. The pilot ordered the engine stopped and the tug to push harder.

The "PACIFIC DOLPHIN", carried by her momentum , continued past Admiralty Point without further noteworthy incident. After the stern cleared the danger, the pilot decided to carry on with the original plan. At 0730, the vessel berthed port side to Pacific Coast Terminal No. 2.

The weather was reported as cloudy with light rain, no wind and a smooth sea. The tide was nearing its high water level (H.W. was at 0850). According to the Canadian Hydrographic Service the predicted surface current, in the vicinity of anchorage "L" at about the time of the occurrence, was north-easterly at one knot, and just off Admiralty Point was northerly at approximately 0.5 knot.

The pilot holds an ON-1 certificate of competency and a Pilot's Licence, both issued in Canada. He had attended all the required upgrading courses: ARPA, SEN, MED, BRM and ship handling. His total sea time was approximately 35 years on various Canadian home-trade vessels. He has worked as a B.C. Coast Pilot since 1991.

Diving operations and internal inspection determined that the "PACIFIC DOLPHIN" sustained damage to her shell plating and bilge keel on the port side between frames 73 and 130. The damage extended longitudinally for approximately 47 m. The bottoms of double-bottom ballast tanks Nos. 3 and 4, port, were indented and the associated frames, stiffeners and floors were distorted. The vessel's plating was not punctured.

Analysis

As there was no wind at the time of the occurrence, the vessel's heading (230°T) at anchor indicates that the tidal current was setting north-eastward towards the land north of Admiralty Point. Given the CHS estimate of a current speed of 1 knot, an object dead in the water would be set in a north-easterly direction at a rate of about 31 metres per minute.

The anchor was seen to be coming clear of the water at about 0608, and it is clear that the anchor was free from the bottom at least half a minute before that the tug commenced pushing on the vessel's starboard bow at this time and the engine was put to slow ahead. By the time the tug was directed to push on the port bow to stop the vessel swinging further, the vessel had gained little if any headway (about two ship-lengths) in the seven and a half minutes which had elapsed since the vessel's anchor was free of the bottom. However, the vessel had been set about 220 m in a predominately north-easterly direction by the current. The beam distance between the vessel's bow at anchor and the rocky shore of Admiralty Point was about 525 m.
The tug pushing on the starboard bow, apart from initiating a port turn, also generated a force which caused the vessel to move bodily to port. To arrest the port swing, the pilot ordered

hard-a-starboard rudder. With the vessel's engine turning slow ahead, this manoeuvre created another force which also caused the vessel to move primarily bodily to port.

The three forces generated by the current set, the tug pushing and the rudder's lateral effect acted in approximately the same direction. The resultant of these three forces was significant enough to cause the "PACIFIC DOLPHIN" to move bodily towards the shore and to strike the rocky bottom at Admiralty Point.

The "PACIFIC DOLPHIN" was conned by an experienced pilot who knew the area and was familiar with handling vessels of this size. The master was in the wheel-house. There had been an exchange of information between the members of the bridge team. However, none of the persons participating in the handling of the vessel fully appreciated the extent of her lateral movement until the tug on the vessel's port side reported that she had been pushed aground.

The attentiveness of an average person when performing any task varies from being vigilant to relaxed. Some of the main factors determining the individual's attitude are the job itself, the frequency of its recurrence, the person's experience and external influences. Because the pilot may not have appreciated the extent of the vessel's bodily movement eastward, his alertness was probably relaxed. He did not look for nor did he double-check all the sources of information available to him to determine the rate at which the tidal current was setting the vessel towards the shore.

The master most probably fully relied on the pilot's local knowledge and experience and did not monitor the pilot's performance or the vessel's movement closely. Given the traditional master/pilot relationship, this reliance is not unusual for the master of a deep-sea ship in a foreign port. The good weather conditions did not appear to demand extra prudence from the master and, given the traditional master/pilot relationship, the pilot's experience and the fact that the vessel was being assisted by two tugs, the manoeuvre did not appear to be unduly difficult. The master's alertness was also at the relaxed end of the scale.

The application of Bridge Resource Management (BRM) principles was limited to the initial exchange of information and there was no formal system in place to closely monitor the vessel's progress. The reduced alertness of the people handling the "PACIFIC DOLPHIN" on
15 February 1998 likely led to the striking.

However, the pilot reacted quickly to the grounding of the tug. He realized that the port side of the "PACIFIC DOLPHIN" was very close to the rocky point and ordered hard-a-port rudder to shift the vessel's stern away from the danger. The manoeuvre did not prevent the vessel from making contact with the bottom. The damage to the shell plating is consistent with the vessel's hull moving along a hard, solid object such as the boulders found in the rocky shore off Admiralty Point.

Findings

1. The manoeuvre began with the "PACIFIC DOLPHIN" anchored in designated anchorage "L" which is in close (three cables) proximity to Admiralty Point.

2. After the anchor was aweigh, the vessel was subject to the surface current which was setting at a rate of about 30 metres per minute towards the shore.

3. To swing the bow to port, a tug was pushing on the starboard bow.

4. The engine of the "PACIFIC DOLPHIN" was turning "slow ahead" and the vessel's rudder was hard-to-starboard but the vessel gained little headway.

5. The effect of the engine movement, rudder position and low headway was that the vessel moved bodily to port.

6. For about eight and a half minutes, the resultant of the forces on the vessel (current set, the tug pushing and the rudder's lateral effect at low headway) acted in approximately the same direction.

7. The vessel was set bodily towards and struck the rocky shore at Admiralty Point.

8. The vessel's progress was not closely monitored; none of the personnel participating in the handling of the vessel observed the extent or rate of the vessel's lateral movement towards the shore.

9. The vessel's propulsion machinery and steering equipment were in good working order. Neither was a factor in the occurrence.

10. The action by the pilot to avert the striking was too late in the circumstances.

11. All actions following the occurrence were timely and appropriate in the circumstances.

12. The damage sustained by the "PACIFIC DOLPHIN" is consistent with the hull touching and scraping against the rocky bottom off Admiralty Point.

Causes and Contributing Factors

The "PACIFIC DOLPHIN" struck the rocky bottom off Admiralty Point because the vessel's lateral movement towards the shore went unrecognized by the bridge team until the situation was too advanced to correct. Contributing to the striking was the fact that a BRM environment was not fully implemented and the vessel's progress along her intended route was not closely monitored.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoît Bouchard, and members Maurice Harquail, Charles Simpson and W.A. Tadros, authorized the release of this report on 18 May 1999.