MARINE OCCURRENCE REPORT

GROUNDING

OF THE BULK CARRIER "MAPLE"
ON LAKE ST. LOUIS, ST. LAWRENCE SEAWAY, QUEBEC
21 SEPTEMBER 1994

REPORT NUMBER M94L0031

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 "MAPLE" was proceeding upbound on Lake St. Louis in the St. Lawrence Seaway toward Lock No. 3 at Beauharnois, Quebec. When the vessel entered the approach basin, the bow was angled to port toward the approach lock wall, and then various engine and helm manoeuvres were carried out to set the bow against the tie-up wall and to slow down the progress of the vessel. However, the vessel did not react as expected. The ship's port side struck the tie-up wall on the east side, and the vessel swung to starboard until the bulbous bow grounded off the opposite wall on the west side. The hull plating on the starboard side of the bulbous bow was ruptured and, consequently, the forepeak was flooded. There was no pollution as result of this accident.

FACTUAL INFORMATION

Particulars of the Vessel

Name	"MAPLE"
Port of Registry	Nassau, Bahamas
Flag	Bahamian
Official Number	707971
Type	Bulk carrier
Gross Tonnage	11,578
Length	151.75 m
Draught	Forward: 78.4 dm Aft: 78.2 dm
Propulsion	Sulzer six-cylinder diesel, 6,032 kW
Crew	28
Guests	2
Owners	Kobbe Howard Compania Naviera Sa Panama, Panama

Forward of the accommodation, the "MAPLE" has four cargo holds. She has two masts with slewing derricks on the centre line of the vessel, one abaft the forecastle and one between hatches Nos. 2 and 3. A goalpost mast is located between the accommodation and the fourth hatch. The vessel has a fixed-pitch right-hand propeller. Engine speeds for "dead slow ahead" and "slow ahead" were, respectively, 5.2 knots (kn) and 7.3 kn.

Vessel records show that the number and the times at which the entries were logged differ in the bridge bell book and the engine movement book. Testimony also differs as to the number of engine manoeuvres carried out before the grounding.

On 21 September 1994, the "MAPLE" was proceeding toward Lock No. 3 at Beauharnois under the conduct of a pilot. The vessel entered the approach basin still making a speed of 5 to 6 kn, and the vessel's axis was reportedly angled approximately 30° to the tie-up wall. Ahead engine "kicks" were given but the bow never set on the tie-up wall. When a half-astern "kick" was produced to slow down the vessel, the bow swung to starboard. Ahead engine "kicks" with hard-a-port helm were ordered. Nevertheless, the vessel turned parallel to the tie-up wall and the ship's side struck the tie-up wall. Then, at the No. 2 Limit of Approach sign, the vessel swung to starboard and proceeded toward the south-west corner of the approach basin. The port anchor was dropped and about 15 m of anchor chain was let go in the water. Astern engine movement was given but, at approximately 2100[1], the bow made contact with the bottom off the opposite side to the tie-up wall.

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[1] All times are EDT (Coordinated Universal Time (UTC) minus four hours), unless otherwise stated.

The vessel reported no mechanical breakdowns or propeller damage that could have affected manoeuvrability before the occurrence. There was no apparent damage to either the ship's port side nor to the tie-up wall as a result of the striking.

Seaway Beauharnois confirmed that the current, which is created by the rate of flow at the weir upstream, was average. The current at the entrance to the approach basin has an easterly set. The turn to port off the Fortier anchorage was made wide to compensate for this drift. There is no appreciable current in the approach basin.

Reportedly, easterly winds at an average speed of 10 kn did not affect the manoeuvrability of the vessel. Pilotage was carried out by visual observation in the darkness. Visibility was good and all navigation aids were reported operational.

ANALYSIS

To improve a vessel's steerage-way at manoeuvring speeds, engine "kicks" are carried out to increase the water flow in way of the rudder thereby increasing rudder efficiency. The ahead engine "kicks" interspersed with stop engine manoeuvres carried out indicate that attempts were made to set the bow against the tie-up wall, but the expected result was not achieved.

On entering the approach basin, the vessel had a headway of approximately 5 to 6 kn. This speed is considered greater than that required to approach a tie-up wall. Considering the vessel's approach speed, evidence suggests that the ahead engine "kicks" may not have been powerful enough to create sufficient propeller thrust to increase rudder efficiency and thereby swing the bow to port.

Since the ahead engine "kicks" could not correct the situation, it was decided to slow down the vessel with a "half-astern" engine manoeuvre. Due to the propeller's fixed right-hand pitch characteristics, the bow swung to starboard and the ship's port side struck the tie-up wall as the vessel adopted a position parallel to the tie-up wall. Lack of damage may be the result of a large section of the ship's side absorbing the impact.

Under the effect of the momentum of the swing of the bow to starboard and of the headway, the stern was subjected to bank suction from the tie-up wall, further reducing manoeuvrability. The subsequent engine manoeuvres did not cause the vessel to swing to port. The vessel was committed toward the lock entrance and, by this time, the pilot and navigating personnel realized that the vessel could not safely enter the lock. The port anchor was let go, but the anchor did not stop the vessel and the grounding occurred.

FINDINGS

1. On entering the approach basin, the vessel had a considerable headway.

2. Even though engine and helm manoeuvres were carried out, the bow never set on the tie-up wall.

3. Due to the propeller's fixed right-hand pitch characteristics, the bow swung to starboard.

4. Bank suction between the port quarter and the tie-up wall prevented the vessel from swinging to port.

5. The anchor and engine manoeuvres did not stop the vessel before she reached the south-west corner of the approach basin.

CAUSES AND CONTRIBUTING FACTORS

When the vessel entered the approach basin, the headway was not reduced sufficiently. The various engine manoeuvres did not develop sufficient propeller thrust for the vessel to react as expected. The propeller's fixed right-hand pitch characteristics did not favour a slow-down manoeuvre toward a tie-up wall on the port side.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, John W. Stants, and members Zita Brunet and Hugh MacNeil, authorized the release of this report on 16 May 1995.