

MARINE OCCURRENCE REPORT

GROUNDING

**OF THE BULK CARRIER "JEANNIE"
ON THE ST. LAWRENCE RIVER
SAINTE-ANNE-DE-SOREL, QUEBEC
25 NOVEMBER 1995**

REPORT NUMBER M95L0189

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

On 25 November 1995, the Greek bulk carrier "JEANNIE", with a cargo of 25,754 tonnes of titanium from Richards Bay, South Africa, was bound for the Port of Contrecoeur, Quebec.

Abreast of Yamachiche, Quebec, on Lac St-Pierre, the generator power unit which powers the gyrocompass failed. In the dark of night, the pilot had the conduct of the vessel and the helmsman was steering using the magnetic compass. On the Île du Moine course, the range marks were not visible because visibility was restricted by sea smoke astern of the vessel. While running along the north side of the channel off Sainte-Anne-de-Sorel to allow another vessel to pass, the "JEANNIE" grounded on the edge of the channel. The vessel was refloated in the morning without assistance and then proceeded to the Sorel anchorage. The vessel did not sustain any apparent damage, and there were no injuries or pollution as a result of this occurrence.

Ce rapport est également disponible en français.

OTHER FACTUAL INFORMATION**Particulars of the Vessel**

Name	"JEANNIE"
Port of Registry	Piraeus, Greece
Flag	Greek
Official Number	9407
Type	Bulk carrier
Gross Tonnage	14,638
Length	183.04 m
Draught	Forward: 10.65 m Aft: 10.60 m
Built	1977, Sunderland, United Kingdom
Propulsion	One Sultzer engine, 7,282 kW
Crew	24
Owners	Tomazos Shipping Co. Ltd. Piraeus, Greece

At about 1249 on 24 November 1995, the generator power unit which powers the gyrocompass failed while the vessel was transiting the Port of Québec, Quebec. One of the generator rotor brushes had become dislocated, but it was put back in place and the generator was restarted immediately by the ship's electrician. The pilot for the Les Escoumins-Québec district reported the failure to the Vessel Traffic Centre (VTC) at Québec by radiotelephone and to the relief pilot for the Québec-Trois-Rivières district at the change of pilots at the pilot station at Québec. The "JEANNIE" reached the Port of Trois-Rivières, Quebec, without incident, and proceeded from there to Pointe-des-Ormes, Quebec, where, at about 2215, a pilot for the Trois-Rivières-Montreal district took over the conduct of the vessel as far as the Contrecoeur anchorage.

At approximately 2328, while on the Pointe-du-Lac course, the vessel yawed approximately 15 degrees to starboard; the generator power unit which powers the gyrocompass had failed again. Under orders from the pilot, the vessel was straightened out in the channel, and the failure was reported to VTC Montreal. The ship's electrician was summoned to the bridge as the vessel reached the Yamachiche anchorage. Two worn brushes of the generator power unit were replaced, but when power was restored to the gyrocompass, it had lost its directional stability.

The pilot was piloting the vessel using a radar with a relative-motion display, and by visual observation of leading lights. At 2335, the speed of the main engine was reduced to half ahead. A minute later, the pilot notified VTC Montreal that he wanted to anchor in the channel

All times are EST (Coordinated Universal Time (UTC) minus five hours) unless otherwise stated.

because he could no longer see the landmarks.

At about 2346, the Sorel ferry "CATHERINE-LEGARDEUR" informed VTC Montreal that visibility was estimated at between four and five nautical miles and that the leading lights were visible. At 2357, the "JEANNIE" reported good visibility as far as Île aux Raisins, Quebec, although there was a patch of fog. At 0005 on 25 November, arrangements were made for an overtaking situation between the "JEANNIE" and the "EMERALD STAR". The pilot reported at the Île des Barques calling-in point at 0048.

At about 0116, the speed of the main engine was reduced to slow. After the vessel yawed a few times, the speed was increased to half ahead. At 0118, however, the speed was reduced to slow ahead again south of Île de Grâce, Quebec, and the vessel began to alter course. The manoeuvre involved passing two cable lengths north of the Sainte-Anne-de-Sorel wharf in order to transit halfway between the middle and the north side of the channel and let the "EMERALD STAR" pass.

The error of the compasses (magnetic and gyro) changed with every course alteration. Before the turn, on the 232°(T) Sainte-Anne-de-Sorel course, the gyrocompass read 230°(G). The turn was initiated by passing from 230°(G) to 245°(G), and then to 260°(G) on the Île du Moine course. The Île du Moine leading lights were not visible astern of the vessel, and there were no means of checking the accuracy of the course steered. At 0119, the "EMERALD STAR" inquired about the position of the "JEANNIE". The latter vessel replied that she was off the Sainte-Anne-de-Sorel wharf and that the lights of the city of Sorel could be seen despite some sea smoke. At 0120, the "JEANNIE" advised VTC Montreal of her intention to anchor at Sorel. Buoy S146 was visible on the radar to starboard of the heading marker, and the south shore was 2.8 cable lengths away.

The vessel, which was running along the north side of the channel, touched the edge and came to a standstill about one cable length west of the position of buoy S140. No impact was felt on board the vessel, but the pilot noticed that the Sainte-Anne-de-Sorel church steeple was motionless relative to the vessel, and the "JEANNIE" reported the grounding to the "EMERALD STAR" at 0124. At 0125, the main engine was stopped.

The "JEANNIE" informed the "EMERALD STAR" that she was on the south side of the channel, but the "EMERALD STAR" questioned the position of the grounding. The "EMERALD STAR" checked the position of the "JEANNIE" and informed that vessel that she was stranded on the north side, and that the "EMERALD STAR" was going to pass on the south.

The "JEANNIE" tried to refloat herself using the main engine between 0126 and 0141 as the "EMERALD STAR" and the "MILIN KAMAK" overtook

her, but the attempts proved unsuccessful. A second attempt to refloat was delayed until morning pending the arrival of a tug and improved visibility conditions. After the "OMISALJ" passed by at about 1013, the "JEANNIE" was refloated without the assistance of a tug and she dropped anchor at the Sorel anchorage at about 1115.

According to the crew, the cargo of titanium slag affected the magnetic compass, which had been calibrated just a few weeks earlier. An analysis of the cargo revealed that there was only about 8.3 per cent iron in the titanium slag. However, the error of the compasses (magnetic and gyro) changed with each course alteration, and, where possible, the pilot conducted the vessel by visual observation and radar, until the compasses stabilized on each new course. Visual look-out astern of the vessel was hampered by the lifeboats stowed in their place behind the wheel-house.

The worn brushes as well as the replacement brushes used on the generator power unit were not original manufacturer's parts.

ANALYSIS

The failure of the gyrocompass occurred downstream of the Yamachiche calling-in point. Before the yaw could be corrected, the vessel had already cleared the Yamachiche anchorage and was heading toward the next anchorage upstream. The pilot had indicated that he intended to anchor in the channel, but the vessel's deep draught forced him to continue on his way.

The power failure experienced by the vessel in the Port of Québec was of short duration and was attributed to a dislocated generator rotor brush. It was possible to put the brush back in place and to restore power. A brief power outage has a negligible effect on the high speed of rotation of a gyrocompass rotor, thereby allowing the compass to remain in azimuth. The worn brushes as well as the replacement brushes used on the generator power unit were not original parts. The information about the first failure was not passed on to the pilot for the Trois-Rivières-Montreal district when he boarded the vessel.

The second failure caused a power outage that reduced the speed of the rotor sufficiently to destabilize the gyrocompass. When power was restored to the gyrocompass, it did not stabilize quickly in azimuth. Accordingly, after each course alteration, the gyrocompass was slow to stabilize and exhibited an unknown gyroscopic error. The gyroscopic error, however, decreased with each new course, and the error appeared to be 2°E on the Sainte-Anne-de-Sorel course. On each new course, the pilot only had visual observation and the radar to guide him, although the relative-motion radar display did not lend itself to navigation by parallel indexing. As the alignment error of the heading marker was negligible, the lateral radar marks

could have been used. The location of buoy S146 to starboard of the heading marker and the vessel's distance of 2.8 cable lengths from the south shore were indications that the vessel was running along the north side of the channel. In addition, by reducing the radar gain, the range landmarks on the heading marker could also have been used to manoeuvre in the middle of the channel. On the Île du Moine course, however, the range landmarks were astern of the vessel.

Several factors affected the conduct of the vessel, including the disruption of the gyrocompass which induced a variable gyroscopic error; the relative-motion radar display which rendered the radar less useful; the absence of buoys S140 and S141; and the reduced visibility which hampered navigation of the vessel by visual observation. In addition, the pilot was considering an overtaking situation between the "JEANNIE" and the "EMERALD STAR".

The grounding occurred slightly upstream of the intersection of the Sainte-Anne-de-Sorel and the Île du Moine courses, after a turn. Although the pilot was unsure as to the gyroscopic error, he planned a course alteration manoeuvre that involved running along the north side of the channel in readiness for overtaking. Because of the failure of the navigation equipment, the pilot was unable to manoeuvre the vessel with the required precision. After the grounding, the pilot's indication to the "EMERALD STAR" that the "JEANNIE" was on the south side of the channel confirms that the pilot was disoriented following the loss of reference points. Planning for course manoeuvres in the middle of the channel and overtaking in the less confined waters of the Port of Sorel would have reduced the risks of an accident.

FINDINGS

1. The worn brushes as well as the replacement brushes used on the generator power unit were not original manufacturer's parts.
2. The failure of the generator power unit disrupted the gyrocompass.
3. The pilot was unsure as to the gyroscopic error that the gyrocompass might be exhibiting on the Île du Moine course.
4. The location of buoy S146 to starboard of the heading marker and the vessel's distance from the south shore were indications that the vessel was running along the north side of the channel.
5. The Île du Moine range marks were not visible because visibility was restricted by sea smoke.
6. The condition of the navigation equipment and the weather conditions did not lend themselves to a precision manoeuvre in a turn on the edge of the channel.

7. The overtaking was not planned outside the confined waters of the channel.

CAUSES AND CONTRIBUTING FACTORS

The failure of the generator power unit which destabilized the gyrocompass produced a variable gyroscopic error that sowed doubt in the pilot's mind. The reduced visibility, the missing buoys and the relative-motion radar display made it impossible to manoeuvre the "JEANNIE" with the required precision.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, Benoît Bouchard, and members Maurice Harquail and W.A. Tadros, authorized the release of this report on 09 October 1996.