

MARINE OCCURRENCE REPORT

CONTACT WITH THE BOTTOM

BULK CARRIER "VULCAN"
AMHERSTBURG CHANNEL,
DETROIT RIVER, ONTARIO
06 NOVEMBER 1996

REPORT NUMBER M96C0093

The Transportation 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 to determine civil or criminal liability.

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Summary

While upbound in the Amherstburg Channel the bottom plating and turn of the bilge on the port side of the "VULCAN" contacted an underwater obstruction after the vessel left the channel. Damage was caused to the vessel's ballast tanks Nos. 1 and 2. No one was injured nor was pollution caused.

Ce rapport est également disponible en français.

Other Factual Information

Particulars of the Vessel

Name	"VULCAN"	
Port of Registry	Valetta	
Flag	Malta	
Official Number	5222	
Type	Bulk Carrier	
Gross Tonnage	17,187	
Length	189.45 m	
Draught	F 7.1m	A 7.2m
Built	1975, Spain	
Propulsion	Sulzer Diesel 11500 bhp	
Owners	Marine Trust Limited Athens, Greece.	

Early morning on 06 November 1996 the "VULCAN" was under the conduct of a U.S. pilot, proceeding upbound in the Amherstburg Channel. The pilot made use of both radars which were in operation. Also on the bridge were the master, officer of the watch(OOW), helmsman and occasionally the watchman. The vessel was on the western, deeper side of the channel which is designated by VTS Traffic for upbound vessels with deeper draughts. At approximately 0230 the vessel was near the upper end of Bois Blanc Island. The weather was clear with good visibility and the water level was 0.77 metres above chart datum. The current in the area was estimated to be between 1.5 to 2 knots. According to the U.S. Coast Pilot No.6 and Canadian Sailing Directions, the strength of the current is between 0.8 and 1.2 knots.

At about 0230, without prior notification of the intention to do so, a change-over from heavy fuel to diesel fuel was begun by the engine-room crew. The engine revolutions per minute (RPM) decreased from 110 to an unknown value (with a corresponding decrease in the vessel's speed) for an undetermined period of time.

While passing light 'D69' and steering a course of approximately 003(T) degrees, the Global Positioning System (GPS) indicated a speed of 5.5 - 5.6 knots over the ground. The pilot decided to bring the vessel further towards the western side of the channel. He communicated his reason for doing so to the master and the OOW; he believed there was a stronger than normal current beyond light 'D71'. The master left the determination of 'how far' to bring the vessel to port, up to the pilot and did not challenge the pilot's decision. At the request of the pilot, the master called the engine room for more RPM. At light 'D71', the vessel had to make an alteration of course to port of 12.5 degrees; here the alignment of the channel changes from 350 to 342.5 degrees (T).

In this area the Limekiln Crossing range lights are an aid to navigation which indicate, at light 'D69', the centre of the western half of the upbound channel. Neither the master nor OOW noted the significance of the Limekiln range lights at the time.

At approximately 0240, the master went to the washroom at the back of the wheelhouse, while the port course alteration was taking place. While passing light 'D69' to port, the vessel was described as being several metres off the light and it was noted that the vessel appeared to be getting closer to the shore. The pilot asked for more

¹ All times are EST (Coordinated Universal Time (UTC) minus 5 hours)

engine RPM but cancelled this request immediately after the vessel was felt to strike on her port side. The striking was described as a 'slam'. At the time of the occurrence there was no other traffic in the area. The pilot did not appear to be concerned and indicated to the master that there wasn't any problem. Neither the master nor the OOW reported the occurrence to Vessel Traffic Services, Sarnia.

At 0330 the pilot notified Vessel Traffic Services Sarnia that the "VULCAN" had developed a list to port and would have to go to anchor at Ojibway anchorage near Windsor, Ontario. The pilot also indicated that the vessel may have struck bottom. At 0635 VTC Sarnia was advised that the vessel was holed in ballast tanks Nos. 1 and 2 and had taken on about 700 tons of water. On arrival in Detroit, Michigan, the U.S. Coast Guard detained the vessel until an underwater survey for damage and seaworthiness had been completed and a repair proposal submitted.

A change of fuel type when under way normally incurs a reduction in RPM. Except for this normal phenomenon, there was no mechanical difficulty or machinery problem noted at the time of the occurrence.

Vessel Traffic Services had not issued a 'Notice to Shipping' concerning higher than normal currents in the area of the occurrence. The current was reported as being normal. Other vessels, more deeply laden than the "VULCAN", navigated through this area without incident both before and after the occurrence. None of these vessels reported unusually strong currents or other difficulty.

Previous to this assignment the pilot had taken two days off. After eight hours of restful sleep, he boarded the vessel at 0850 on 05 November at the Port Colborne anchorage.

The master had made several trips into the Great Lakes in previous years, but in a lesser capacity than master.

Following the pilot's report of the possibility of an underwater obstruction in the channel, two sounding surveys and bottom profile tests of the occurrence area were conducted by the Canadian Coast Guard, Amherstburg. No anomalous depth or obstruction was found in the channel nor, outside of the channel to within 12 to 24m of the shore. The distance from the western edge of the channel to the shore varies from 24 to 30 m. The "VULCAN" had 30 m of manoeuvring room on each side when in the centre of the deep portion of the channel.

The GPS unit was examined and tested and showed the correct co-ordinates for latitude and longitude and its other functions were working correctly.

Analysis

While proceeding up the deeper portion of the Amherstburg Channel, the forward speed of the "VULCAN" was observed to have decreased. The reduction in speed was due to a fall in the number of RPM of the main engine. Because the engine-room staff had not informed the bridge that a change-over from heavy to diesel fuel was taking place, which change-over normally requires a reduction in RPM, those on the bridge were not immediately aware of the cause of the loss of speed. The GPS speed reading of 5.5 to 5.6 knots was briefly taken as an indication by the pilot that the current in the area was abnormally strong.

Because he suspected that the current was abnormally strong, the pilot intended to direct the vessel towards the western side of the channel to make allowance for the set he anticipated would set the vessel bodily to starboard after passing light 'D71'.

Although the pilot discussed his belief that the current was stronger than usual with the master, neither the master nor the OOW independently monitored (except for the vessel's heading) the vessel's movement bodily across the channel. Neither the master nor the OOW challenged either the pilot's belief that the current was unusually strong or his course of action.

While the port course alteration was being executed, the amount of the vessel's lateral motion (sideways crabbing) across the channel was not detected until it was too late and it was at this time that the pilot again asked for more RPM. At the time the vessel's lower side shell plating (in way of the turn of the bilge on the port side) 'slammed' the edge of the channel, it would appear that the RPM had returned to approximately 110 - because the pilot cancelled his request for an increase in RPM.

The pattern of the damage sustained by the "VULCAN" is consistent with that which would be caused by the vessel striking an obstruction at the edge of the channel while the vessel was moving ahead and bodily sideways (crabbing). Because the two sounding surveys and bottom profile tests of the area between lights 'D69' and 'D71' revealed no anomalous depth or obstruction in the channel, the damage sustained by the "VULCAN" is also consistent with the vessel having struck an underwater obstruction outside the navigable portion of the channel.

Although there was some exchange of information, the principles of Bridge Resource Management (BRM) which emphasize the importance of communication and of establishing an environment where all persons on the bridge feel free to question assumptions and intended actions were not in force. This situation allowed for a brief period when the cause of the vessel's loss of speed was not readily apparent to the pilot and the OOW. The result of this was that the allowance made for the set anticipated above light D 71 was greater than necessary. When the set experienced was less than anticipated, the vessel 'crabbed' rapidly across the channel, striking the obstruction outside the western limit of the channel.

Findings

1. The bridge team was unaware that the engine-room staff were carrying out a change-over from heavy to diesel fuel. The change-over requires a reduction in engine RPM.
2. The fuel change-over was not made in open water with room to manoeuvre but in a narrow constricted channel subject to cross-currents.
3. The pilot briefly attributed the reduction in the vessel's speed to a stronger than normal current and made an allowance for set to stop the vessel being set bodily to starboard above light D 71.
4. Neither the master nor the OOW challenged either the pilot's belief that the current was unusually strong or his course of action.
5. The pattern of the damage sustained by the "VULCAN" is consistent with that which would be caused by the vessel striking an obstruction at the edge of the channel while the vessel was moving ahead and bodily sideways (crabbing).
6. The damage sustained by the "VULCAN" is also consistent with the vessel having struck an underwater obstruction outside the navigable portion of the channel.
7. Two post-occurrence sounding surveys and bottom profile tests of the area between lights 'D69' and 'D71' revealed no anomalous depth or obstruction in the channel nor, outside of the channel to within 12 to 24m of the shore.
8. A post-occurrence verification of the main propulsion machinery confirmed that the machinery functioned as designed.
9. There was no report of an abnormally strong current in the area of the occurrence.

10. Both before and after the occurrence, vessels at a deeper draught than the "VULCAN", navigated the area without incident. None of these vessels reported unusually strong currents.
11. The vessel was not being navigated in a Bridge Resource Management environment; there was a lack of communication especially between the bridge and engine-room staff.

Causes and Contributing Factors

The "VULCAN" struck an underwater obstruction outside the western limit of the Amherstburg Channel because officers on the bridge team were unaware that engine-room staff were making a fuel change-over which necessitated a reduction in main-engine RPM. The corresponding reduction in the vessel's speed was briefly attributed to a stronger than normal current and an over-correction was made to stop the vessel setting towards the east. The vessel was not effectively monitored for set and she was set bodily outside the western limit of the navigable channel. Full use was not made of the vessel's navigation equipment or of shore-based aids to navigation. A Bridge Resource Management environment was not in place to optimize the use of the bridge personnel.

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 30 July 1998.