



SAFETY INVESTIGATION REPORT

2012904/039

REPORT NO.: 09/2020

April 2020

MV KLARA

Collision with Singapore registered general cargo / container ship POSIDANA and the Belgian tug BRAAKMAN in position 51° 16.875' N 003° 15.342' E

on 30 April 2019

The Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 prescribe that the sole objective of marine safety investigations carried out in accordance with the regulations, including analysis, conclusions, and recommendations, which either result from them or are part of the process thereof, shall be the prevention of future marine accidents and incidents through the ascertainment of causes, contributing factors and circumstances.

Moreover, it is not the purpose of marine safety investigations carried out in accordance with these regulations to apportion blame or determine civil and criminal liabilities.

NOTE

This report is not written with litigation in mind and pursuant to Regulation 13(7) of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011, shall be inadmissible in any judicial proceedings whose purpose or one of whose purposes is to attribute or apportion liability or blame, unless, under prescribed conditions, a Court determines otherwise.

The report may therefore be misleading if used for purposes other than the promulgation of safety lessons.

© Copyright TM, 2020.

This document/publication (excluding the logos) may be re-used free of charge in any format or medium for education purposes. It may be only re-used accurately and not in a misleading context. The material must be acknowledged as TM copyright.

The document/publication shall be cited and properly referenced. Where the MSIU would have identified any third party copyright, permission must be obtained from the copyright holders concerned.

SUMMARY

Klara was enroute to Ghent, Belgium, laden with linseed. A Dutch pilot was on board. *Posidana* was an outbound ship, assisted by two tugs *Braakman* and *Union 5*, navigating slightly on the starboard side of the Canal. *Klara* adjusted her course to pass *Posidana* on the port side. When *Klara* was close to the bank on her starboard, the pilot steadied the vessel parallel to the shoreline.

As the two ships approached each other, *Klara* took a sudden and an uncontrollable sheer to port side.

An immediate reaction on the helm, bow thruster and main engine speed had no effect. *Klara* continued swinging to port and collided into *Braakman* and pushed her against the opposite bank. *Klara*, now almost perpendicular to the Canal, was hit by *Posidana* on her starboard side. The collision occurred at night and in moderate to good visibility.

Considering the safety actions taken by the Company, no safety recommendations were made.



FACTUAL INFORMATION

MV Klara

Klara (Figure 1) was a 4,125 gt Maltese registered general cargo vessel, owned by HS Klara OU and managed by Hansa Shipmanagement OU, Estonia. The vessel was built by Bodewes Shipyard B.V., Netherlands, in 2010. *Klara*, which was classed with RINA, had a length overall of 103.13 m and a moulded breadth of 15.2 m.

Propulsive power was provided by one MAK, 6M25, four stroke, internal combustion diesel engine, producing 2,010 kW at 750 rpm. The estimated speed of the vessel was 12 knots.



Figure 1: Cargo vessel *Klara*

General cargo / container ship Posidana

Posidana (Figure 2) was a 39,258 gt, Singapore flagged general cargo / container ship, owned by Masterbulk Private Limited. She was managed by Westfal-Larsen Management AS, Norway. The vessel was built by Oshima Shipbuilding Company, Japan, in 2008. She was classed with DNV-GL. *Posidana* had a length overall of 212.5 m and a moulded breadth of 32.26 m.

Propulsive power was provided by one Kawasaki MAN B&W, 6S60 MC (MK6), two stroke, internal combustion diesel engine, producing 12,268 kW at 101 rpm. The ship's design draft was 11.5 m and speed 15.5 knots. She was fitted with a bow and stern thruster.



Figure 2: General cargo / container ship *Posidana*

Tug boat Braakman

The 39-ton bollard pull, 249 gt tug *Braakman* (Figure 3) was registered in Belgium. The tug was built by Scheepswerf van Rupelmonde NV, Belgium, in 1991. *Braakman* had a length overall of 31.99 m and breadth 8.70 m. She was operated by Smit Harbour Towage, Belgium NV. The registered owners of the tug were Unie Van Redding-En Sleepdienst, Belgie NV.

Braakman was propelled by one ABC 8 MDZC-800-173K, internal combustion medium speed diesel engine, developing 2130 kW at 800 rpm. The tug was fitted with a telescopic bow thruster.



Figure 3: Tug boat *Braakman*

Manning

The crew compliment on board *Klara* was in accordance with the Minimum Safe Manning Document issued by the flag State Administration. Except for one deckhand, all crew members were Russian nationals. *Klara's* bridge team was made up of the master and second mate. The master was 53 years old and had 9 years experience as master on cargo ships trading worldwide, including the Norwegian waters, Baltic and the Mediterranean Sea. He held a valid Master's Certificate of Competency.

The second mate was a navigation officer of the watch (OOW). He was 30 years old. He was licensed to keep navigational watch at sea and had 10 years' experience in that capacity. He had been on board *Klara* for about a month.

At the time of the collision, a Dutch pilot was on board on the wheel.

Tug boat *Braakman* was certified to trade in the North Sea and English Channel, not exceeding 20 nm or six hours from port of refuge or sheltered anchorage. She was manned by a master, a chief mate and a chief engineer. The manning was in accordance with the Minimum Safe Manning Document issued by the Belgium Administration. The master held a valid STCW II/3 and IV/2 Certificate.

The crew compliment on board *Posidana* was also in accordance with the Minimum Safe Manning Document. All crew members were from the Philippines. At the time of the collision, a locally engaged helmsman was steering the vessel, whilst the bridge team was made up of the master, the third mate and an AB, who was on lookout duty. The master was in command with the pilot advising the master and giving helm orders to the helmsman.

Environment

The master of *Klara* reported calm waters in the Canal, wind speed of five knots and a moderate to good visibility. The air temperature was 10 °C.

Narrative¹

Klara was on passage from Ust-Luga, Russia to Ghent, Belgium. She had 4,600 tonnes of linseed inside her cargo spaces. At 2130, on 29 April 2019, she arrived at Flushing roads on an even keel draft of 5.2 m. A Dutch pilot boarded the vessel. Following pilot / master exchange of information, *Klara* headed for Terneuzen locks, enroute to her arrival berth.

The master and second mate were on the bridge and the pilot was steering and controlling the ship's speed. *Klara* cleared the lock and proceeded up the Terneuzen-Ghent Canal. Shortly after midnight, at 0008, the vessel passed Sluiskil Bridge. The vessel was in the middle of the channel, on a course of 167° and making 8.0 knots.

At this time, there were four barges ahead of *Klara*, all going in the same direction. A fifth barge, *Imperial Gas*, was sailing in the opposite direction and was about to pass *Klara* on the port side. Behind *Imperial Gas*, at a distance of about 1500 m, was *Posidana*, which was outbound. She was also being piloted by a Dutch pilot and steered by a locally engaged helmsman.

Posidana was under propulsion, with tug *Braakman* made fast, assisting on the bow. Tug *Union 5* was fast aft. *Posidana* was slightly to the starboard side in the straight section of the Canal, steering 349° and making 6.1 knots (Figure 4). She was exhibiting three all-round red lights, indicating that her draft of 7.40 m in relation to the available depth of water in the Canal. She was constrained by her draft and severely restricted in her ability to deviate from her

¹ Unless otherwise stated all times in this report are local times (UTC + 2).

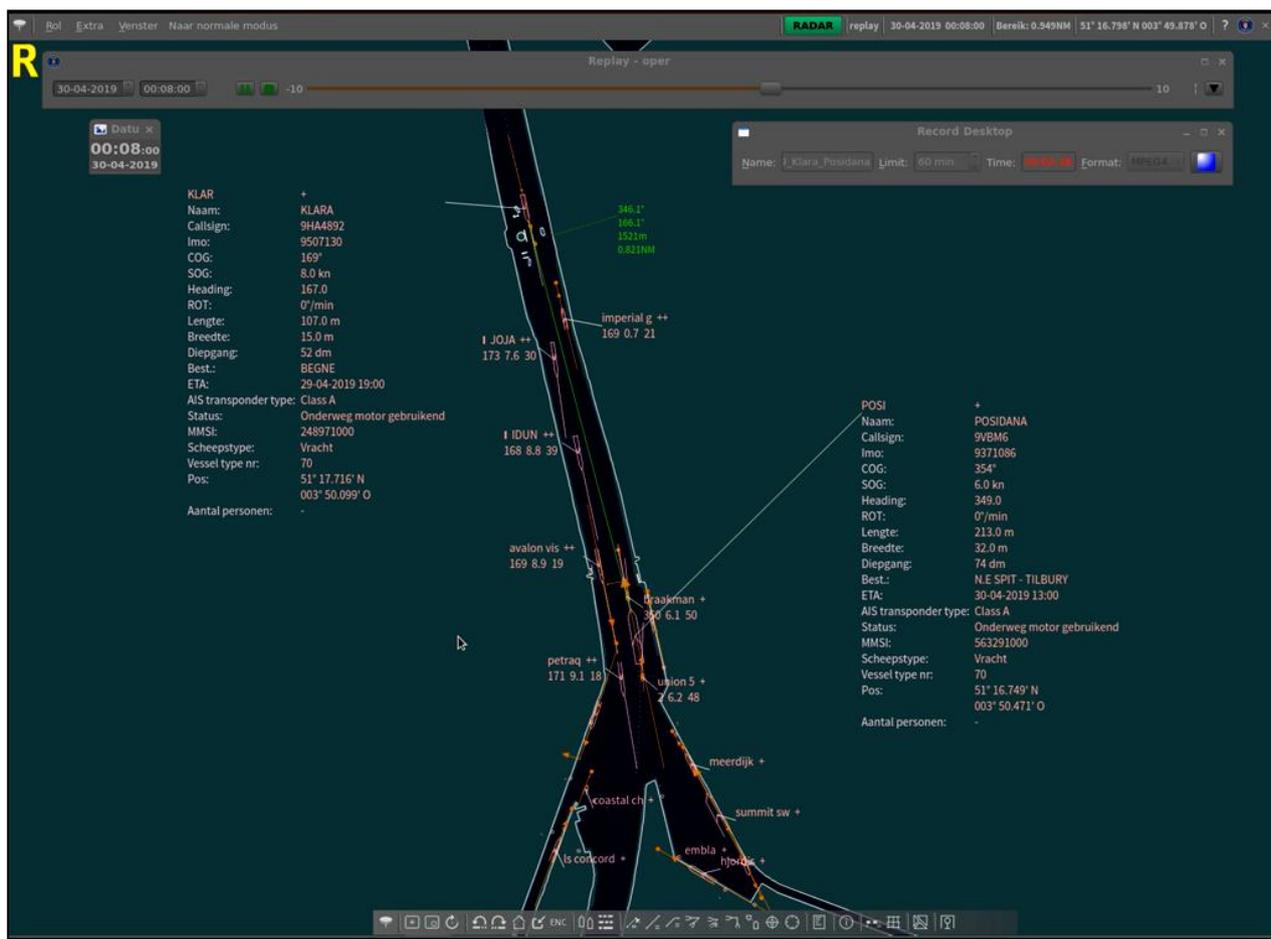


Figure 4: VTS image showing traffic situation at 0008

course.

Klara's pilot adjusted her course to starboard towards the bank for *Posidana* to pass on the former's vessel port side. Shortly after passing *Imperial Gas* at 0010, *Klara's* course over the ground was 174° and speed 8.1 knots.

The pilot reported that on reaching Height Marker 9.6 kilometre, he started to turn the vessel slowly to port to get to the Canal course of 168° (parallel to the shoreline). Until about 0010/30s, the manoeuvre was uneventful.

On reaching Height Marker 9.4 Kilometre, and with *Posidana's* bow around 450 m away, *Klara* started to turn quickly to port. The helm was put hard over to starboard and the engine telegraph briefly set back to

reduce speed (Figure 5).

Notwithstanding these actions, the vessel continued swinging rapidly to port; the main engine was then put to full ahead and the bow thruster to starboard to restraint the rate of turn of the vessel.

In less than a minute, however, *Klara* veered to around 30° from her original heading. The pilot on *Klara* advised *Posidana* and set *Klara's* telegraph to full astern to break the ahead movement, whilst *Posidana's* pilot immediately directed the aft tug to go full astern and the ship's engine dead slow, stop, and slow astern. Meanwhile, tug *Braakman's* master, observing *Klara* still swinging to port, immediately released the towing gear and put the engines full astern to avert the collision.

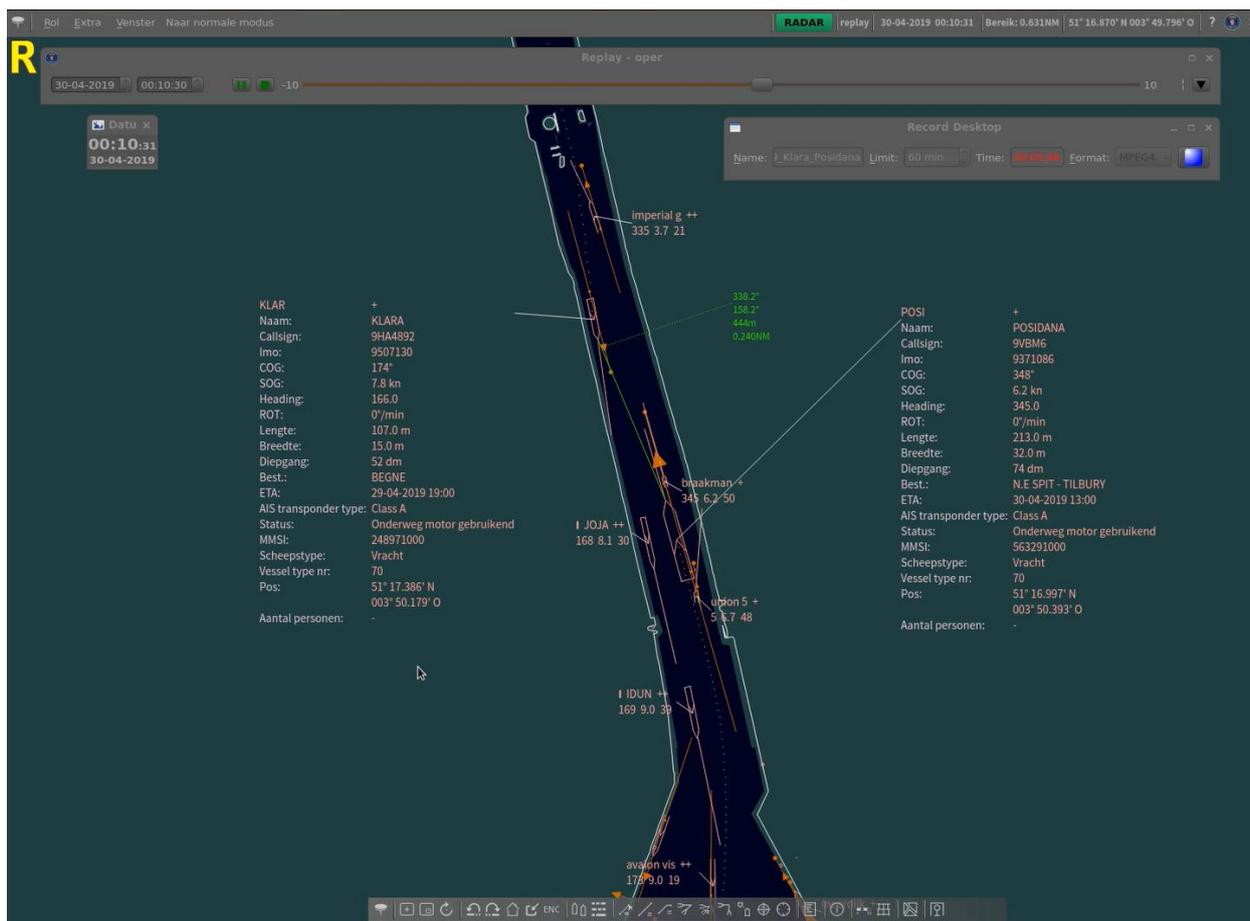


Figure 5: VTS image showing traffic situation at 0010/30s

At 0011/30s on 30 April 2019, *Klara* collided into tug *Braakman* and pushed her against the opposite bank, sustaining serious damages. Thereafter, *Klara* ended up almost across the bow of the container ship. About 30 seconds later, *Posidana's* stem struck *Klara* on her starboard midsection between frames 56 and 74 (Figure 6). The collision occurred in the Dutch sector of the Ghent-Terneuzen Canal in position 51° 16.875' N 003° 15.342' E (Height Marker 9.1 Kilometre).

Immediately after the collision, *Klara* sounded the general alarm. It became evident that cargo hold no. 2 had been breached and the vessel took a 5° list, although she remained afloat. A berth was immediately made available and *Klara*, manoeuvred by her master, moored at Heros Terminal, Sluiskil. Meanwhile, *Posidana* cleared Sluiskil Bridge and at 0106, dropped her anchor at Massagoed Haven. Tug *Braakman* was eventually released from the tow.

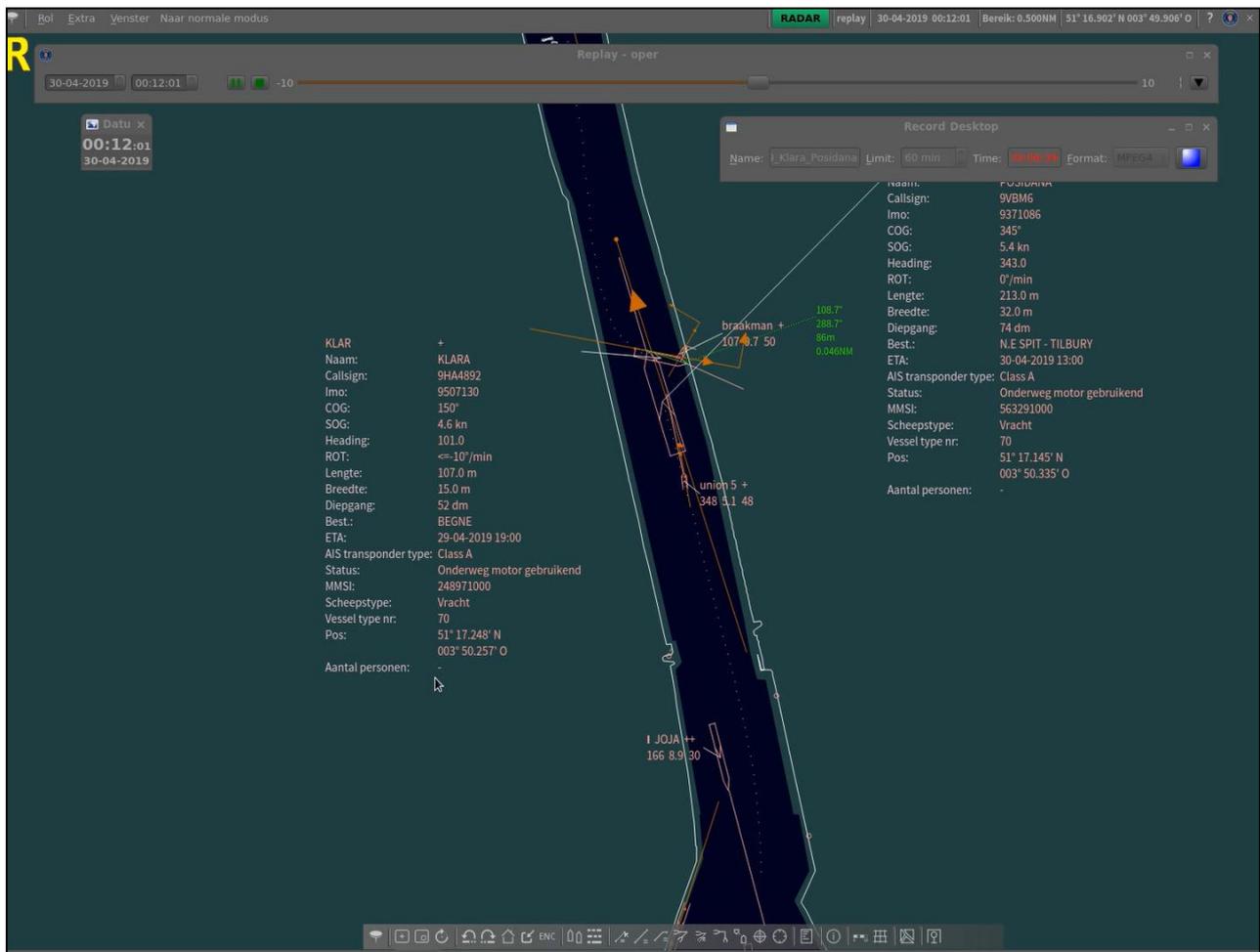


Figure 6: VTS image showing collision between *Klara* and *Posidana*

Structural damages

As a result of the collision, *Klara* sustained severe damages to the main deck structure and fittings, and her hull between frames 56 and 74 (Figure 7). Cargo hold no. 2 was breached with reported water ingress. Part cargo of linseed spilled into the sea (Figure 8).

After carrying out temporary repairs and discharge of cargo, *Klara* proceeded to a shipyard for a detailed structural damage survey. On 14 May 2019, RINA recorded damages to the starboard side shell plating, starboard longitudinal bulkhead and transverse bulkheads, inner bottom, main deck stringer plate, hatch covers and hatch coamings starboard side and partly port side.



Figure 7: Structural damages in way of the cargo hold



Figure 8: Linseed cargo spilled from the cargo hold

Posidana had contact damage above the waterline. The Class surveyor reported damages in the forepeak tank (stem area), deformed shell plating and damages to the centre girder at the stem. Other shell plating damage was observed at the stem, towards the port side (Figure 9). There was also perforation of the shell plating in two locations on the stem.

Tug *Braakman* reportedly sustained damages to her bow thruster, a dent on the side, and some minor damages at the bow. The lower section of the bow thruster was broken and lost. The towing wire had parted and the 15 m towing pendant was elongated and narrowed at some spots, rendering it not in conformity with the relevant certification.

In the engine-room port side, on and above the platform, there were soft indentations in the shell plating from frames 28 to 26. Frame 24 and web frame 25 were slightly bent and buckled, while frames 26 and 27,

including the platform bracket, were slightly bent. The welding seam cracked and failed above the platform.

No oil pollution was reported and none of the crew members on board suffered any injuries.



Figure 9: Shell plate damage on *Posidana*'s stem

The Ghent-Terneuzen Canal

The Ghent-Terneuzen Canal connects Ghent directly to the Scheldt River and the North Sea, via a maritime lock at Terneuzen. The Canal stretches for 18 nautical miles and is mostly straight and non-tidal. It was enlarged in 1968 and the dredging of the Canal entrance was undertaken in the early 1990s. The Canal is about 150 m wide in The Netherlands and broadens to 200 m inside Belgium. The depth is 13.5 m and is accessible to vessels with 12.5 m draft.

ANALYSIS

Aim

The purpose of a marine safety investigation is to determine the circumstances and contributory causes of the accident as a basis for making recommendations, to prevent further marine casualties or incidents from occurring in the future.

Bathymetric data

The MSIU was provided with a copy of the bathymetric chart for the area of the Ghent-Terneuzen Canal, where *Klara* encountered uncontrollable sheer. Bathymetric charts, covering Height Marker 9.6 to 9.1 Kilometre, presented measurable descriptions of the submerged terrain, water-depths and contour lines.

On the West side of the Canal, the charts documented a sharp fall of water depths, suggesting heavy sedimentary deposits. Another sharp elevation of the Canalbed was noted from the six-metre contour, up to the shores of the bank. The six-metre contour set-off near Height Marker 9.6 Kilometre and spreads out to about 25m (Figure 10) into the Canal and stretches along the Canal beyond Height Marker 9.1 Kilometre.

The contours and sediment deposits had an effect on the hydrodynamic interactions of the vessel, which will be explained in more detail in the following sub-section.

The collision

After transiting Sluiskil Bridge, *Klara* was in the straight reaches of the Canal and navigating in the middle of the channel. As *Posidana* reached the straight section of the Canal, the pilot manoeuvred *Klara* towards the West bank to allow *Posidana* pass on her port side. When she was relatively close to the bank, *Klara*'s pilot adjusted her helm to port, to line up the vessel parallel with the shoreline. At Height Marker 9.5 Kilometre, *Klara* was drawing up to an unseen sharply shelving Canalbed.

The hydrodynamic forces intensified and the bow took a violent sheer to the port and across path of the approaching vessels. Given the ship's speed, propeller action and asymmetrical water flow around the vessel, it was very likely that the stern pulled towards the bank and amplified the rotational speed of the sheer to port.

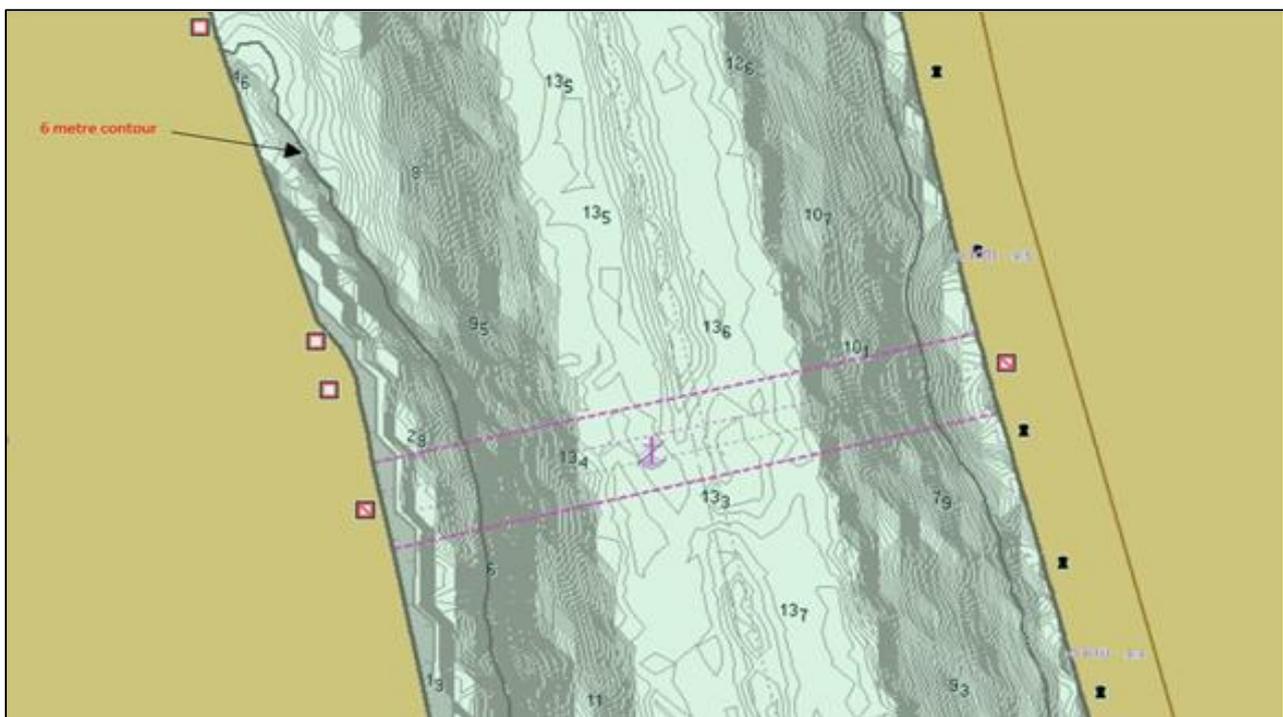


Figure 10: Bathymetric chart showing six metre contour and sharp elevation of the Canalbed

The use of the bow thruster, counter rudder and engine speed simultaneously by the pilot, at this point, were not enough to counter the hydrodynamic forces acting on the vessel's hull.

In this unexpected situation, control of *Klara* was completely lost and a collision with the approaching *Posidana* and the tug *Braakman* was unavoidable. At this point, there was little that *Posidana*'s bridge team could have done to avoid the collision other than minimise the effects of the impact.

CONCLUSIONS

1. The collision was caused by *Klara* taking an uncontrollable sheer and moving across the path of the approaching vessels;
2. *Klara* smelled² the ground while sailing close to the bank;
3. *Klara*'s speed and the close proximity of the bank probably increased the rotational speed of the turn;
4. Action taken by *Klara*'s pilot to check the sheer were insufficient to counteract the hydrodynamic forces acting on the vessel and prevent colliding with *Braakman*;
5. *Posidana* under tow, was constrained by her draft and was unable to manoeuvre out of the way.

² Smelling the ground refers to a vessel sailing extremely close to the shallower waters resulting in uncontrollable sheer.

SAFETY ACTIONS TAKEN DURING THE COURSE OF THE SAFETY INVESTIGATION³

The following safety actions were taken by *Klara*'s managers during the course of the safety investigation:

- Vessels under Hansa Ship Management were informed of the collision and the Company's internal investigation report was forwarded to all the crew members;
- The following changes were made in the Company's Safety Management System:
 - i. master, or, in his absence, the duty officer, has the ultimate command of the vessel and the presence of a pilot on board in no way absolves the master or the duty officer from this responsibility;
 - ii. navigation by pilot shall be monitored continuously and the duty officer shall ensure that the pilot's advice is acknowledged;
 - iii. if the master, or, in his absence, the duty officer, finds the pilot's navigation faulty and that it may create hazardous situation(s) for the vessel, crew or cargo, he shall take appropriate action;
 - iv. appropriate action may include relieving the pilot of direct command, and shall be affected by a statement: 'Pilot, I take over'. When the hazardous situation is clear, the master, at his discretion, may handover navigation to the pilot, subject to the pilot's clear acknowledgement.
- Special attention was drawn to precautions during sailing in shallow and congested waters;
- Training of masters and navigational officers to be carried out regularly for the operation of vessels in inland

³ Safety actions and recommendations should not create a presumption of blame and/or liability.

waterways, its bottom and bank suction / cushion effect, and checked by SQ Manager during regular visits on board; and

- assessment of risks before entering shallow waters shall be carried out and risks re-assessed while sailing through these waters.

RECOMMENDATIONS

In view of the safety actions taken by the Company, no safety recommendations were made.

SHIP PARTICULARS

Vessel Name:	<i>Klara</i>	<i>Posidana</i>	<i>Braakman</i>
Flag:	Malta	Singapore	Belgium
Classification Society:	RINA	DNV-GL	LR
IMO Number:	9507130	9371086	8915457
Type:	General Cargo	General Cargo / Container	Tug
Registered Owner:	HS Klara OU	Masterbulk Private Ltd.	Unie Van Redding-En Sleepdienst, Belgie NV
Managers:	Hansa Shipmanagement OU	Westfal-Larsen Management AS	Smit Harbour Towage, Belgium NV
Construction:	Steel	Steel	Steel
Length Overall:	103.13 m	212.50 m	31.99 m
Registered Length	101.43 m	207.5 m	28.37 m
Gross Tonnage:	4102	39258	249
Minimum Safe Manning:	10	14	3
Authorised Cargo:	General cargo	General cargo & lo-lo	NA

VOYAGE PARTICULARS

Port of Departure:	Ust Luga, Russia	Ghent, Belgium	Ghent
Port of Arrival:	Ghent, Belgium	Tilbury, UK	Terneuzen
Type of Voyage:	International	International	Inland
Cargo Information:	Linseed	Pet coke & plywood	NA
Manning:	10	20	3

MARINE OCCURRENCE INFORMATION

Date and Time:	30 April 2019 at 0011/30s LT		
Classification of Occurrence:	Serious Marine Casualty		
Location of occurrence:	51° 16.875' N 003° 15.342' E (Ghent Terneuzen Canal)		
Place on board	Overside, main deck & cargo hold	Stem	Over side
Injuries / fatalities:	None	None	None
Damage/environmental impact:	Damages to the main deck, hull & cargo	Shell plating & girder on stem	Hull
Ship Operation:	Under pilotage	Under pilotage	Towing
Voyage Segment:	Arrival	Departure	Transit
External & Internal Environment:	Overcast. Visibility was moderate to good. Sea was calm and the air temperature was 10 °C		
Persons on board:	11	22	3