MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

ACCIDENT REPORT

SERIOUS MARINE CASUALTY | REPORT NO 10/2011 | JUNE 2011

MV *ANTONIS*

Contact with Langton-Alexandra swing bridge In the Port of Liverpool 11 December 2010

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SUMMARY

Antonis, a Greek registered bulk carrier, was being manoeuvred stern-first from the port of Liverpool's Langton Dock to Alexandra Dock with a pilot on board. As she entered the passageway between the docks, her stern started to drift towards the eastern wall under the influence of a north-westerly wind. The pilot was unable to counter the drift, and the vessel's hull, in way of a topside fuel oil tank, made contact with the sharp edge of a counterweight fitted on the open swing bridge. This caused a 1.5 metre gash in the vessel's side that resulted in about 330 tonnes of fuel oil spilling into the dock system.

The counterweight had been fitted when the swing bridge had been lengthened.

The investigation found that, prior to the accident, the port authority, Mersey Docks and Harbour Company Ltd, had not identified that the counterweight on the refurbished bridge was a potential hazard to marine operations, and that no formal risk assessment had been conducted since the bridge had been refurbished.

The port authority intends to implement a number of actions designed to enhance the safety of vessels using the Langton-Alexandra passageway. Mersey Docks and Harbour Company Ltd has been recommended to expedite this work.

Antonis

FACTUAL INFORMATION

Narrative

Antonis embarked a pilot at the Liverpool Bar at 0120 (UTC) on 11 December 2010. She was in ballast and bound for Alexandra Dock **(Figure 1)**, where she was to load a cargo of iron scrap destined for Thailand. The bridge was manned by the master, second officer, helmsman and a pilot, who had conduct of the vessel.

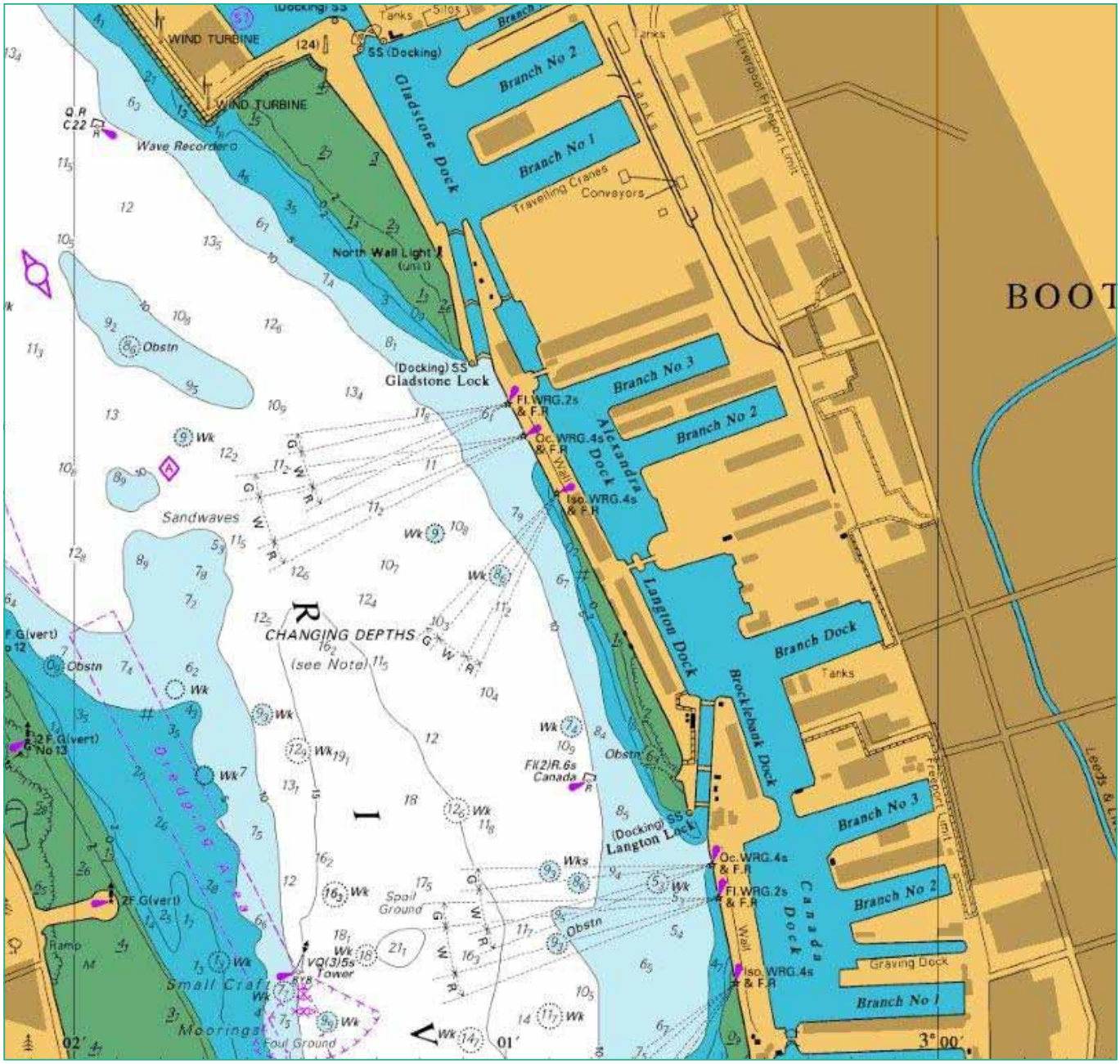
At about 0230, the deck crew were tasked to go to their mooring stations. By 0256, two tugs, one forward and one aft, were made fast just before the vessel arrived off Langton Lock **(Figure 1)**. A third tug was also available.

At 0300, the pilot manoeuvred the vessel stern-first into Langton Lock.

At 0325, the vessel was all fast and, at 0329, locked-in with the three tugs in attendance.

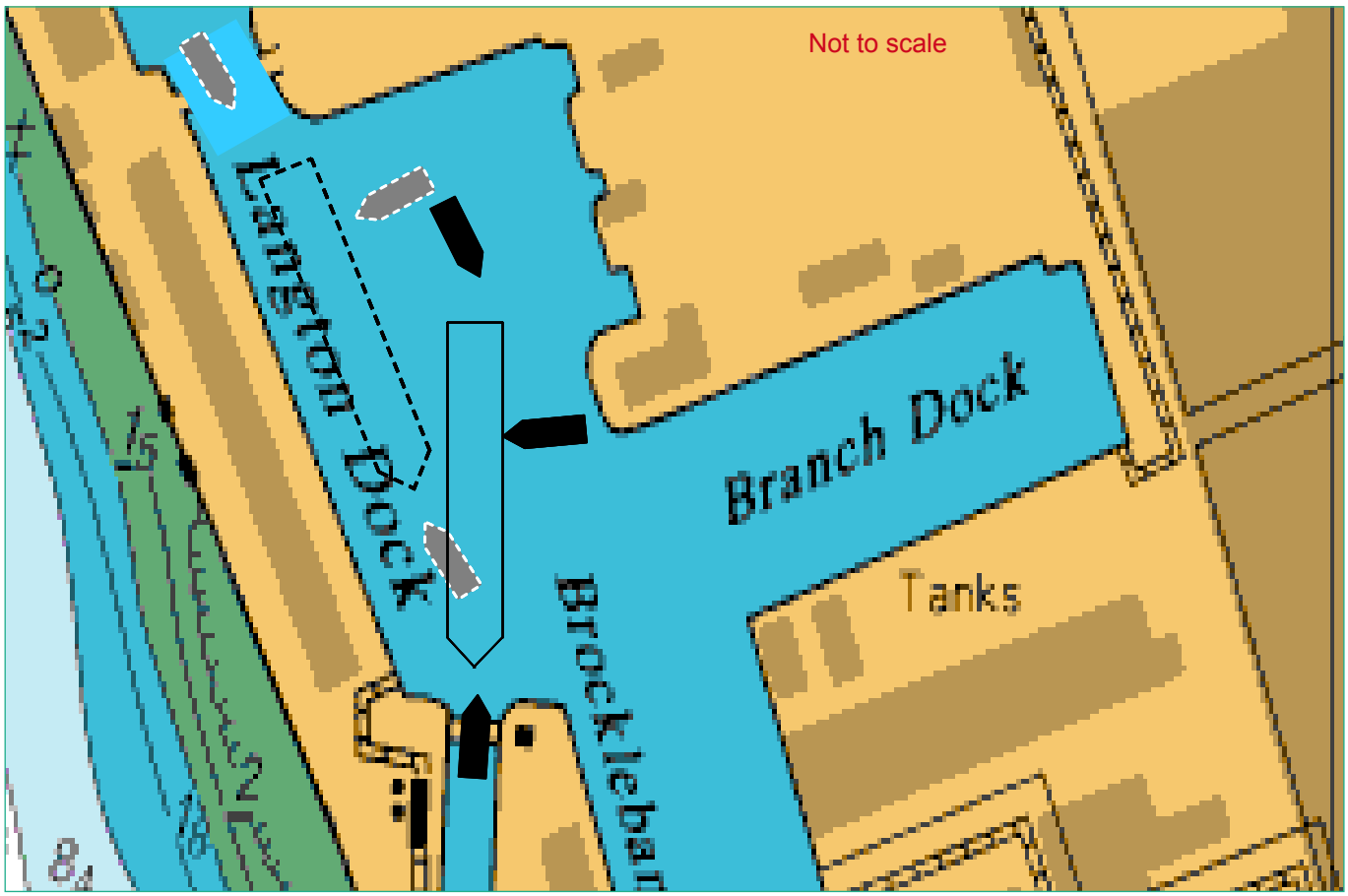
At 0408, *Antonis* left Langton Lock stern-first under tow by the aft tug. Once *Antonis*'s bow was clear of the lock **(Figure 2)**, the pilot ordered the forward and aft tugs to adjust the alignment of the vessel in preparation for the transit of the Langton-Alexandra passageway. The third tug was tasked to push on the vessel's port side as and when required by the pilot. The pilot and master positioned themselves on the port bridge wing to monitor the progress of the transit.

Figure 1



Layout of docks

Figure 2



Entry into passageway

At 0424, the pilot ordered dead slow ahead to reduce the vessel's speed astern and allow use of the rudder to control her stern's lateral movement. The pilot intended to keep the vessel to the eastern side of the passageway. As the vessel entered the passageway, the pilot noticed her stern drift towards the eastern wall. He ordered the third tug to 'push with full weight', which was acknowledged and implemented by the tug's master. The pilot also ordered the helm 'hard-a-port'. However, these actions did not prevent the vessel's hull from making contact with the sharp edge of a counterweight ballast tank fitted on the open and recessed swing bridge **(Figure 3)**.

Figure 3

Swing bridge showing counterweight

The contact occurred at 0428 in way of No 5 (P) topside fuel oil tank and caused a 1.5 metre gash in the vessel's side **(Figure 4)**. This resulted in heavy fuel oil spilling into the dock.

Figure 4

1.5 meter gash

The master immediately called the engine room and ordered the chief engineer to start transferring the oil from No 5 (P) to other tanks. He also told him to pump out ballast from the port side to create a starboard list in an attempt to stop the oil flow into the dock.

The pilot, in consultation with the master, continued to bring the vessel into Alexandra Dock Branch No 2 and held the vessel off the berth until the outflow had stopped. At 0437, he reported the incident to the duty dockmaster. By 0440, this information had been cascaded to all relevant parties, including the harbourmaster, coastguard and police, in accordance with the port's oil spill response plan.

Despite efforts by the vessel's crew to stem the flow of oil, about 330 tonnes entered the dock system.

Langton-Alexandra swing bridge

As part of its expansion plans, The Mersey Docks and Harbour Company (now part of Peel Ports Limited) decided in 2005 to relocate its scrap berth from Gladstone Dock to Alexandra Dock. This required the passageway between Langton and Alexandra Docks to be widened to accommodate larger vessels.

Work to widen the passageway from 27 to 39.46 metres **(Figure 5)** was completed in September 2006 when the passageway was re-opened to traffic. In April 2007, the swing bridge was lifted out to be refurbished and lengthened. This work was completed in April 2008. To compensate for the increased length of the swing bridge, a rectangular counterweight was fitted **(Figure 3)**. The extension to the bridge resulted in its end overhanging the northern end of the eastern wall inside Alexandra Dock when in a stowed position. This made it vulnerable to contact from passing traffic **(Figure 6)**.

Figure 5

Langton-Alexandra passageway

Figure 6

Langton-Alexandra passageway swing bridge

Figure 7

Western wall of passageway

Since the passageway was re-opened in 2006, 130 vessels of more than 100 metres in length have used it. There has been only one reported incident, in February 2008, when a south-bound vessel made contact with the north-west corner **(Figure 7)** of the passageway, resulting in an indentation to the vessel's hull above the waterline. Since April 2008, 75 vessels of more than 100 metres in length have used the passageway.

ANALYSIS

Contact with the bridge

The contact with the bridge occurred as the pilot was attempting to arrest the vessel's stern drift towards the eastern wall. *Antonis* was in ballast with a high freeboard and was easily influenced by the wind acting on her starboard side. The pilot recognised this, and tried to counter the effect by using the vessel's rudder and ordering the third tug to push. However, these actions did not prevent the vessel making contact with the eastern wall. The pilot was assisted by the three tugs but the leading tug was limited in her ability to provide lateral movement once she had entered the passageway. Although the third tug had applied full power, it was not sufficient to regain control of the vessel and to arrest the stern's drift towards the eastern wall.

Even though the swing bridge was open and recessed, *Antonis* was able to make contact with the sharp corner of its counterweight **(Figure 3)** due to the hull overhang in the area of No 5 (P) fuel oil tank.

Prior to the accident, the port authority had not identified the counterweight as being a potential hazard to vessels using the passageway.

Operational parameters

Antonis's passage plan into Langton Lock and through the passageway was agreed by the pilot and master as required by Port of Liverpool's pilotage directions, and towage and navigational guidelines.

The entry into the dock system with the three tugs in attendance exceeded the port's requirement which stipulated that two tugs were to escort a vessel of *Antonis*'s size. Although the effects of drizzle on visibility, and of the wind on a high-sided vessel in ballast, made the pilot's task more demanding, the prevailing conditions were within his normal operational parameters.

The pilotage

As was standard practice, the orientation of vessels entering Langton Lock was dictated by the tide. Vessels routinely entered the lock bow-first on a flood tide and stern-first on an ebb tide as this allowed the pilot to keep maximum control of the vessel in the river by stemming the tide. However, manoeuvring a vessel stern-first in the confines of the dock could be very demanding even with three tugs available to assist. Once inside the dock, there was not enough room to turn vessels of the size of *Antonis*, to preclude the need to manoeuvre stern-first.

When moving vessels through the Langton-Alexandra passageway, the pilots preferred to position them closer to the eastern wall because

it was believed that, if vessels landed against this wall, no damage to the ship or wall would be caused. The passageway's western wall **(Figure 7)** was poorly fendered, built of concrete and more likely to cause damage if landed upon. The risk of a vessel's overhang making contact with the swing bridge counterweight had not been recognised.

Entering the Langton-Alexandra passageway bow-first would have given the pilot greater control of the vessel and improved his situational awareness. However, agreeing to enter the lock while the tide in the river was ebbing meant that *Antonis* had to enter the lock stern-first, and therefore the Langton-Alexandra passageway stern-first.

Risk Management

The Port Marine Safety Code[1] requires all risks covering marine operations to be formally assessed so that they are both tolerable and as low as reasonably practicable. To this end, the port authority had undertaken a programme of risk assessment and had created a formal marine safety assessment risk register. However, the risk assessment for dock operations, conducted in February 2006, identified hazards only when swing bridges were in the closed position to allow road traffic to pass.

In November 2008, the pilotage services company, in a monthly meeting with the port authority, highlighted its concern at the lack of fendering around the Langton-Alexandra passageway and, in particular, the exposed bridge end. No concerns were raised over the newly fitted counterweight to the bridge. Subsequent meetings with the port authority in 2009 and 2010 highlighted concerns over poor lighting, and poor fendering on the western wall and the south side of the eastern wall.

However, no formal risk assessment had been conducted since the bridge had been refurbished.

CONCLUSIONS

1. Although the pilot used the vessel's rudder and ordered the third tug to push, he was unable to regain control of the vessel and counter the stern's drift towards the eastern wall.

2. Prior to the accident, the port authority had not identified that the counterweight on the refurbished bridge posed a hazard to vessels using the passageway.

3. The pilots preferred to keep vessels to the eastern side of the passageway as the western wall was built of concrete and was poorly fendered, but the potential hazard posed by the bridge's counterweight had not been recognised.

4. Entering the lock system stern-first, although demanding, was standard practice for the state of tide; the prevailing conditions were within the pilot's normal operational parameters; and the manoeuvre was agreed between the pilot and master in accordance with the port's directions and guidance. However, *Antonis* would have been easier to control had she entered the passageway bow-first, though this would have required her entry into the lock to be delayed until the flood tide was running.

5. The port authority's generic risk assessment for dock operations identified hazards only when bridges were in a closed position.

6. Poor fendering and lighting, and lack of protection for the exposed bridge end had been highlighted previously in meetings between the port authority and pilotage services company.

7. No formal risk assessment had been conducted since the bridge had been refurbished.

[1] The code has been developed to improve safety in UK ports and to enable harbour authorities to manage their marine operations to nationally agreed standards.

ACTIONS TAKEN

Mersey Docks and Harbour Company Limited:

- Has increased the fendering on the western wall.
- Intends to install low level indicator lights to assist in locating the waterline within the passageway.
- Intends to discuss with the tug companies possible improvements to the fendering on the south side of the eastern wall.
- Intends to improve the fendering in the passageway and protection to the bridge end.
- Intends to discuss with the pilotage services company how the use of the third tug can be optimised to enhance pilots' control of the manoeuvre through the passageway.
- Intends to complete a formal risk assessment for vessels transiting the dock system.

RECOMMENDATIONS

Mersey Docks and Harbour Company Ltd is recommended to:

2011/118 Expedite measures planned which are designed to improve the safety of vessels using the Langton-Alexandra passageway.

Marine Accident Investigation Branch
June 2011

SHIP PARTICULARS

Vessel name	*Antonis*
Flag	Greece
Classification society	Lloyd's Register
IMO number	8126630
Type	Bulk Carrier
Registered Owner	Bolero Trading Corporation
Manager(s)	Adelfia Shipping Enterprises S.A.
Construction	Steel
Length overall	182.75 metres
Registered length	175.75 metres
Beam	31.00 metres
Gross tonnage	25935
Minimum safe manning	11
Authorised cargo	In ballast

VOYAGE PARTICULARS

Port of departure	Piraeus
Port of arrival	Liverpool
Type of voyage	International
Cargo information	In Ballast
Manning	23

MARINE CASUALTY INFORMATION

Date and time	11 December 2010 at 0428 (UTC)
Type of marine casualty or incident	Serious Marine Casualty
Location of incident	Langton-Alexandra Dock, Liverpool
Place on board	No 5 (port) topside fuel oil tank
Injuries/fatalities	None
Damage/environmental impact	1.5 metre gash in tank causing about 330 tonnes of heavy fuel oil to spill into the dock
Ship operation	Berthing
Voyage segment	Arrival
External & internal environment	Wind: Fresh Breeze, NW 15-20 Knots Visibility: Moderate, due to drizzle Ebb tide
Persons on board	23