

Investigated accident case 3

Collision in Hayatomo Seto, in Kanmon Passage, between a westbound cargo ship and an eastbound pusher/barge unit in strong tidal streams

Outline: Manned by a master and 17 crew members, Cargo ship A, which left Tsukumi Port, Oita Prefecture, was proceeding westward in the Kanmon Passage, and, on the other hand, manned by a master and three crew members, Pusher B, after leaving a dredging area west of Mutsure Shima Island, was engaged in pushing a barge (Vessel C) eastward through the Kanmon Passage to a mud-and-sand dumping ground off Kanda Port, Fukuoka Prefecture. Vessels A and C collided about 37 seconds past 1446 hours on October 13, 2008, in Hayatomo Seto. Vessel A sustained cracks to the bottom shell plating in the bow section. On the other hand, Vessel B suffered damage and Vessel C sank. There were no fatalities, or even injuries, on board either vessel.

Events leading to the accident

Vessel A (cargo ship)

Gross tonnage : 9,872 tons
 L × B × D : 134.93m × 23.00m × 11.50m
 Flag state : The Republic of Panama
 Crew members, etc. : Master A (of the Republic of the Philippines) and 17 crew members
 Load condition : No cargo

About 1401.13 hrs

He received information from Kanmon MARTIS to the effect that the tidal stream under the Kanmon Bridge had reached a speed of 7 knots and was increasing its speed.

Posting, on the bridge, two deck officers as his assistants and a sailor as a helmsman for manual steering, and, stationing, on the bow, the boatswain and a sailor as an anchor team, Master A (*1) sailed westward at full speed through the Kanmon Passage.

About 1442.03 hrs

She overtook Vessel D—which was sailing in the same direction—at a speed over the ground of 9.9 knots, on the port side of the other.

As a result of the overtaking of Vessel D, she ended up sailing in the middle part of the Kanmon Passage.

About 1442.10 hrs

After overtaking Vessel D, he first sighted the pusher/barge unit of Vessel B, in the vicinity of the Kanmon Bridge.

Vessel A



Principal factors

[Weather and sea conditions]

The weather was fine at the material time. In Hayatomo Seto the tidal stream was flowing eastward at its peak speed of about 7 knots. Vessels might encounter tidal streams ranging from 3 to 7 knots, depending on the location of the area. Circulating currents (see *2 on Page 10) appeared in waters in the vicinity of Moji Saki.

Although Master B was under the instruction to sail at a speed no more than 6 knots with a following tide, the tidal stream at the time was in excess of 6 knots.

With experience of passage under the Kanmon Bridge in tidal streams flowing at a speed of 6 to 7 knots, Master B did not expect any problem.

*1 Master A's knowledge of Kanmon Kaikyo

- ◆ As to precautions about passage through Kanmon Kaikyo, he had not consulted the relevant Sailing Directions other than reading the explanations entered in the relevant charts.
- ◆ He did not have any knowledge that, during a period of eastgoing tidal streams, eastbound vessels might be driven toward the side of Shimonoseki (Dannoura) when sailing in waters off Moji Saki.
- ◆ Although he had experienced passage in head currents, the encounter with a tidal stream reaching 7 knots was his first experience.

Only because he did not see, by sight, any other vessel ahead, Master A believed that there was no on-coming vessel.

He did not obtain information on vessels in transit from the automatic identification system (AIS) or Kanmon MARTIS.

Events leading to the accident

Vessel B (pusher)

Gross tonnage : 93 tons
 L × B × D : 28.4m × 7.0m × 3.2m
 Flag state : Japan
 Crew members, etc : Master B and 3 crew members

Vessel C (barge)

L × B × D : 60.0m × 14.0m × 4.1m
 Loaded cargo: Dredged mud

The electrical display board at the Daibahana Tidal Current Signal Station showed that, at Hayatomo Seto, a tidal stream was flowing eastward at a speed of about 7 knots, indicating that the vessel was to sail with a strong, following current.

Master B posted a sailor to the helm for manual steering and proceeded eastward through the Kanmon Passage.

When sailing waters about 400 m short of reaching the Kanmon Bridge, he sighted, for the first time, Vessels A and D coming from ahead in the vicinity of Kanmon Passage No. 31 lightbuoy.

About 1443.01 hrs

He passed under the Kanmon Bridge at a speed over the ground of 8.9 knots (the maximum speed before collision was 10.3 knots).

Vessel B



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About 1445.55 hrs

Thinking that there was a danger of collision with the pusher/barge unit of Vessel B, Master A put the rudder hard over to starboard.

About 1446.02 hrs

She stopped the engine.

About 1446.03 hrs - 1446.11 hrs

With the pusher/barge unit of Vessel B closing to a distance of about 400 m, he stopped starboarding and reversed the helm hard over to port.

About 12 seconds past 1446 hours, Kanmon MARTIS requested vessels in transit to change the VHF channel in order to announce, in English, information on the strong tidal stream in Hayatomo Seto. (*3)

About 1446.37 hrs

On a heading in a range from 232° to 236° at a speed of 8 to 9 knots, the bow of Vessel A collided with the port side of Vessel C.

Her starboard turn off Moji Saki was too late.

He paid attention not to enter an area of circulating currents (*2) which would make course-keeping difficult.

She was driven by the strong, following tidal stream.

Vessel B was sailing near the center line of the Kanmon Passage.

Sensing a danger of collision with Vessel A, Master B put the rudder hard over to starboard.

*2 The Sailing Directions for Seto Naikai (issued in March 2009 by Japan Coast Guard) says: A circular flowing current is formed south of a line connecting Moji Saki and Kanmon Passage No. 32 lightbuoy and, during the period of an eastgoing tidal stream, east-bound vessels with the intention to approach Tanoura Wharf may find it difficult to maintain their course since they may take a sheer to starboard when the bow section is exposed to this circular flowing current.

With Vessel D close to his starboard quarter, he did not have the freedom to put the rudder to starboard.

With a strong, head current, he did not keep a sufficient distance away from Vessel D.

Master A intended to pass Vessel B (integrated pusher/barge unit) starboard to starboard.

Despite his effort to put the rudder hard over to starboard, his vessel did not respond to it and the pusher/barge unit of Vessel B was drawing closer and closer from dead ahead.

About 1446.15 hrs

When Vessel A closed to a distance of about 300 m, she worked the engine full astern while giving sound signals on the whistle.

About 1446.37 hrs

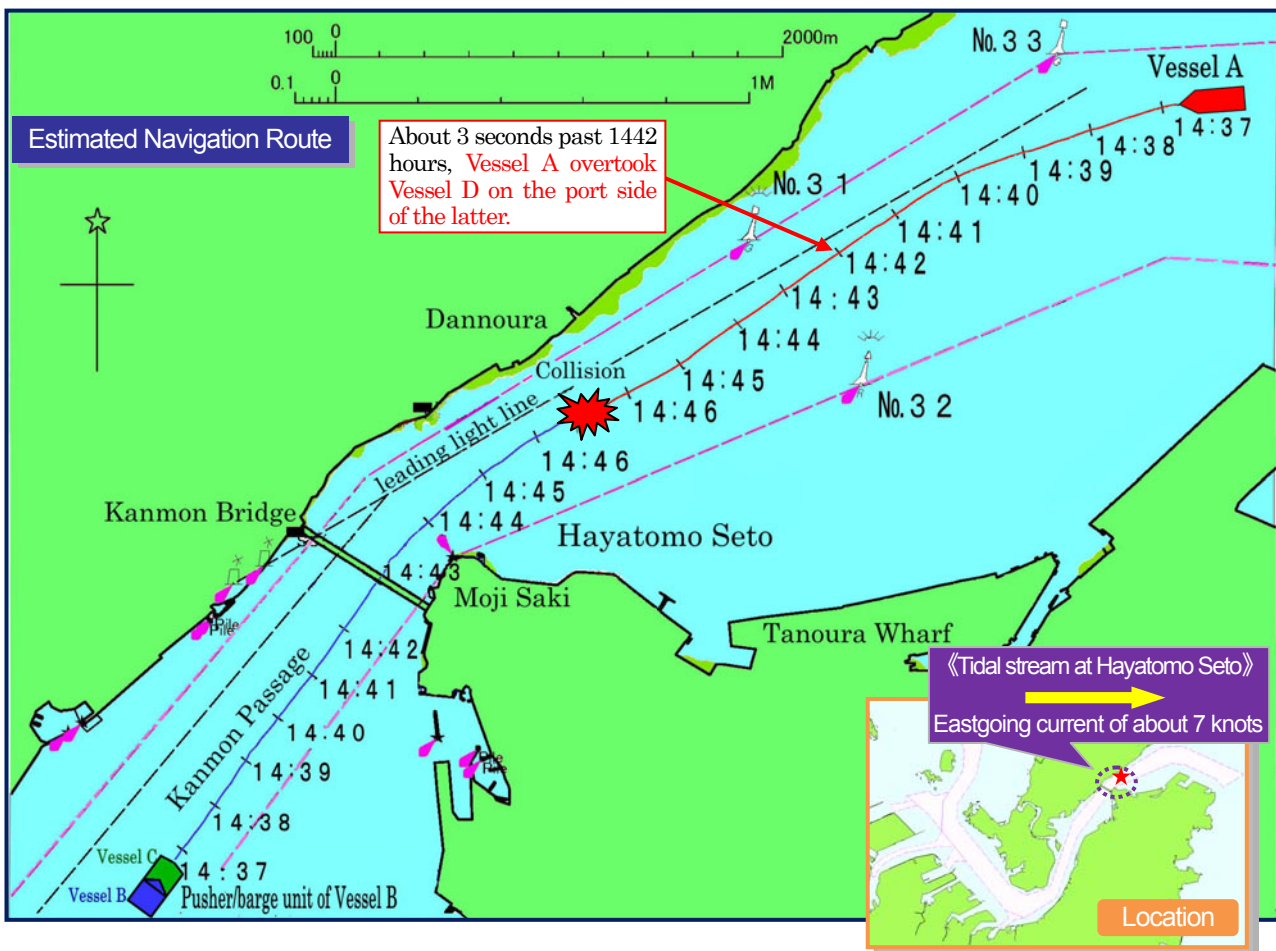
On a heading of 106° and a course over the ground of 53.4°, at a speed of 7.5 knots, Vessel C collided with Vessel A.

Sinking Vessel C



*3 Provision of information by Kanmon MARTIS

◆ When the velocity of the tidal stream in Kanmon Kaikyo is equal to or more than 7 knots, Kanmon MARTIS broadcasts, by VHF, at intervals of 30 minutes, general information about tidal streams which may affect vessels to sheer.



Analysis on navigation rules

In Kanmon Port, vessels are supposed to observe special sailing rules as specified in the Regulations for the Enforcement of the Act on Port Regulations. To Vessel A and the pusher/barge unit of Vessel B, the sailing rules for 'overtaking' and 'keeping to the starboard side' apply. It is considered probable that they did not comply with these rules.

Special sailing rule on the basis of the Regulations for the Enforcement of the Act on Port Regulations

Sailing rules related to 'overtaking'

- ▶ **In the Kanmon Passage**
A vessel may overtake the other vessel only if both of the following conditions are met:
Considering the surrounding situation,
 - (1) if such other vessel does not need to take any action for the safe passage of the overtaking one; and
 - (2) if such other vessel can safely keep out of the way of vessels other than the overtaking one.
- ▶ **For overtaking another vessel**
 - (1) When a vessel intends to overtake another one on the starboard side of the latter, she shall sound a prolonged blast on the whistle or siren, followed by a short one.
 - (2) When a vessel intends to overtake another one on the port side of the latter, she shall sound a prolonged blast on the whistle or siren, followed by two short ones.

Sailing rule related to the 'Keep-to-the-right rule'

- ▶ When sailing the Kanmon Passage or Kanmon Passage No. 2, motor vessels are required to sail on the starboard side of the passage as far as practicable.

It was not apparent, in the event of Vessel A overtaking Vessel D, whether Vessel A could keep safely out of the way of the oncoming vessel since, with Vessel D close to her starboard quarter, she did not have the freedom to quickly shift to the starboard side of the passage. Consequently, she should not have overtaken Vessel D.

Both Vessels A and the pusher/barge unit of Vessel B intended to sail on the starboard side of the passage.

Master A was not aware of the special sailing rule concerning 'overtaking'.

Vessel A overtook Vessel D on the port side of the latter.

The pusher/barge unit of Vessel B was driven away from her course by the strong, following tidal stream.

Both Vessels A and B (pusher/barge unit) ended up sailing in the middle part of the Kanmon Passage.

With a view to preventing recurrence

This accident occurred between westbound Vessel A and the eastbound pusher/barge unit of Vessel B in Hayatomo Seto, Kanmon Passage, when an eastgoing tidal stream was flowing at a speed of about 7 knots.

It is considered probable that Vessel A, which overtook Vessel D, and the pusher/barge unit of Vessel B, which was driven away from her course by strong tidal streams, were forced to sail in the middle part of the passage, resulting in their inability to keep out of the way of the other.

The JTSB has conducted the following analysis with a view to preventing a recurrence of a similar accident.

Analysis for the prevention of a recurrence of a similar accident

1. Without overtaking another vessel in Hayatomo Seto, Vessel A should have sailed, forming a line after another vessel ahead, (*) so far as practicable, while following the relevant leading lights and leading line.
2. The pusher/barge unit of Vessel B should have obtained information about tidal streams so as to be able to sail at an appropriate speed.
3. Both vessels should have used the AIS to obtain information about other vessels and, where possible, communicated with each other by VHF to exchange their intentions.
4. Both vessels should have actively obtained, from Kanmon MARTIS, information on vessel traffic in the vicinity of Moji Saki.

* For westbound vessels, the leading lights situated in the vicinity of the north side of the Kanmon Bridge over Hayatomo Seto and the leading line marked on the relevant chart, are available.

◆ Important points for safe navigation in Hayatomo Seto are shown on Page 15.

The investigation report of this accident is publicized on the website of the JTSB(issued on Feb. 26, 2010).

http://www.mlit.go.jp/jtsb/ship/report/MA2010-2-16_2008mj0033.pdf (Japanese version only)