General Description of Kanmon Kaikyo (Strait)

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- General Description of Kanmon Kaikyo
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- Collisions and Groundings in the Western Section of Kanmon Kaikyo
- Marine Accident Cases (Collisions in the Western Section)

Kanmon Kaikyo is a narrow strait—with a navigable width of only about 500 meters at the narrowest part, off Moji Saki—extending about 15 miles from He Saki in Moji-ku of Kita-Kyushu City to Mutsure Shima of Shimonoseki City. It features sharp bend, which prevent mariners from getting a view into the distance, and strong tidal current which sometimes exceed 9 knots. Despite such difficulties to navigation, Kanmon Kaikyo sees the passage of more than 600 vessels a day, including foreign-flag vessels which use the channel as a gateway to economically developing East Asia, such as China and Korea, making the strait a vital artery for maritime traffic.

Almost all of Kanmon Kaikyo lies within an area that is subject to the Port Regulations Law and, in recent years, the navigation environment of the area has been improved by such efforts as the extension of the Kanmon Passage both in length and width, and the reduction of the acuteness of bend of the same passage, installation of the Hiko Shima Leading light and synchronization of the flashing of the relevant light buoys. The introduction of compulsory sailing on the starboard side of the passage has helped bring about more orderly vessel flows, thus realizing increased safety for vessel transits through the channel.

The Kanmon Kaikyo Traffic Advisory Service Center (the Kanmon Martis) started operating a navigation support system for vessels equipped with AIS (automatic identification system) in July 2005.

Situation of marine accidents in the eastern section of Kanmon Kaikyo

Among the marine accidents (collisions and groundings) for which judgments were delivered by the relevant marine accident inquiry agencies over a period of five years from 2002 to 2006, 10 collisions involving 20 vessels, and 4 groundings involving 4, occurred in the Kanmon Passage and its adjacent waters, lying to the east of the longitude of Ganryu Shima. Of the 20 vessels involved in the above collisions, 12, accounting for such a large proportion of 60%, were those registered in foreign countries.

By the location of the accident within the area, 4 collisions and 2 groundings occurred in Hayatomo Seto; and 2 collisions and 2 groundings in the vicinity of the bend of the passage located to the northeast of Ganryu Shima. At the eastern entrance to Kanmon Kaikyo, in waters off He Saki, 4 collisions occurred. However, ever since the Kanmon Passage was extended to include waters off He Saki in September 2001, no collision has taken place in the extended portion of the passage.
Collisions and Groundings in the Eastern Section of Kanmon Kaikyo

Collisions and groundings for which judgments were delivered over a period from 2002 to 2006 (those involving passenger ships, freighters and oil tankers)

Since the extension of the passage in September 2001, no collision has taken place inside its extended part.

In Hayatomo Seto, pay attention to sheering during strong tidal current! Keep a sufficient distance from another vessel sailing ahead so as to avoid an overtaking situation in the vicinity of Moji Saki!

Prompted by the November 1997 marine accident in which two foreign-flag vessels collided, with one of them sinking inside the passage, the passage was dredged to widen its breadth. This was completed in July 2002.

Of the 20 vessels involved in collisions, 12 were foreign-flag vessels!

Cases of marine accidents in Hayatomo Seto — Reckless overtaking is strictly prohibited!

[During easterly tidal current]
- An eastbound vessel sailing close to the center of the passage took a sheer toward the side of Shimonoseki, after passing under the Kanmon Bridge, resulting in a collision with a westbound vessel.
- A westbound vessel which was about to overtake another vessel in Hayatomo Seto—from a location in the center or slightly to the port side of the passage—noticed an eastbound vessel and attempted to return to the starboard side of the passage. In the process, the vessel took a sheer toward the side of Shimonoseki and collided with the vessel being overtaken. (cf. Page 4)

[During westerly tidal current]
- An eastbound vessel located in the vicinity of the boundary line of the passage, where the tidal current was weak, was unintentionally brought in a situation to overtake another eastbound vessel which was sailing close to the center of the passage, where the tidal current was relatively strong, and caught up with the latter vessel in the vicinity of Moji Saki, resulting in a collision. (cf. Page 4)
- A vessel which had sailed in the vicinity of Moji Saki at a large angle against the direction of the tidal current, failed to make a turn because of a difference in pressure between the forward and aft parts of the vessel, resulting in a grounding.

Tidal current in the vicinity of Hayatomo Seto — Sensible navigation with a knowledge of tidal current!

In Hayatomo Seto, the westerly tidal current is strongest at about the time of high tide in Moji Saki and Dannoura, and the easterly tidal current is strongest at about the time of low in both places.

The area with the strongest tidal current (strongest-current area) in the vicinity of Moji Saki stretches from the north to the west (close to the center of the passage) of a current rip which extends from off Moji Saki.

- During easterly tidal current: Area 200 to 300 meters wide and about 1,200 meters long; it extends northeastward, from the vicinity of Moji Saki, along the Kanmon Passage, but slightly closer to Shimonoseki.
- During westerly tidal current: Area 150 to 300 meters wide and about 2,000 meters long; it extends southwestward, from the vicinity of Moji Saki, along the Kanmon Passage, but slightly closer to Shimonoseki.

(Source: the Hydrographic and Oceanographic Department, 7th Regional Coast Guard Headquarters; see the next page)
Eastbound vessels are required to exercise caution as they may be driven toward the side of Shimonoseki both during easterly and westerly tidal current!

The strongest-current area extends from Moji Saki to Dannoura. Eastbound vessels are cautioned against being brought to the side of Shimonoseki.

Eastbound vessels are subject to strong tidal current forces on the starboard bow, in the vicinity of Moji Saki, and caution is required when turning to starboard!

Source: the Hydrographic and Oceanographic Department, 7th Regional Coast Guard Headquarters
Summary

The Japanese tanker ‘K’ was sailing northeastward under the conn of the master, in the manual steering mode, on the starboard side of the passage, in strong tidal current. The master noticed the Malaysian-flag freighter ‘B’ approaching from his starboard quarter. However, presuming that the freighter would not overtake his own tanker, he did not monitor the movement of the freighter. Meanwhile, the freighter ‘B’ was sailing northeastward, under the conn of the master, in manual steering mode, close to the outer limit on the starboard side of the passage, where the tidal current was relatively weak. The master of the freighter ‘B’ judged that, even had his vessel drawn nearer to the tanker—which was sailing ahead of him—in the vicinity of Moji Saki, he would be able to overtake her safely, because the tanker would make a gradual starboard turn along the bend of the passage. Therefore, he continued to overtake the tanker without sounding overtaking signals. The freighter ‘B’ steered to port, 2 minutes before the collision, so as to keep away from Moji Saki and, then, steered to starboard after passing under the Kanmon Bridge. However, the freighter was not able to swing to starboard—because she was overcome by the strong westerly tidal current coming from his starboard bow—resulting in a collision.

(2) -2 min.
Although the freighter had closed to 540 meters, he did not sound warning signals.

(1) 5 min.
The master of the tanker sighted the freighter ‘B’ closing to 1,050 meters on her starboard quarter. He presumed that the freighter would not overtake his tanker in the vicinity of Moji Saki.

(1) -5 min.
The master of the tanker presumed that he would be able to overtake the tanker ‘K’ on ‘K’’s starboard side, because ‘K’ would make a gradual starboard turn along the bend of the passage in the vicinity of Moji Saki.

Never attempt to overtake another vessel in the vicinity of Moji Saki, where the navigable width is restricted and there are strong tidal current flow! When you intend to overtake another vessel in the Kanmon Passage, do so in a long, straight stretch in a sensible manner. Sound an overtaking signal so as to attract attention.

A vessel is allowed to overtake another one in the Kanmon Passage, only ‘if she needs no cooperative action, for her safe passage, from the vessel being overtaken’ and, in addition, ‘if she can safely keep out of the way of the other.’

Specified sailing rules

But

Even if you have no intention to overtake another vessel! There is a need to exercise caution. During westerly tidal current, an eastbound vessel sailing in the vicinity of the boundary line of the passage, where the tidal current is weak, can be unintentionally brought in a situation in which she overtakes another eastbound vessel sailing close to the center of the passage, where the tidal current is relatively strong.
Summary

The Panamanian-flag freighter 'S' was sailing southwestward in the center of the Kanmon Passage, at the entrance to Hayatomo Seto, with the intention to overtake the Japanese tanker 'K', when Kanmon Kaikyo Traffic Advisory Service Center (the Kanmon Martis) gave a warning to the freighter by VHF, saying, “Never overtake the tanker ‘K’.” The freighter, however, did not respond to this call and continued overtaking the tanker, by proceeding to the port side of the passage. At about the same time, the freighter noticed the lights of two eastbound vessels and attempted to return slightly to her starboard side, but she took a rapid sheer toward the side of Shimonoseki, resulting in a collision with the tanker ‘K’.

1. (-)7 min.
Sailing at a speed over the ground of 4.8 knots against an easterly tidal current
The master of the tanker overheard the Kanmon Martis tells the freighter ‘S’, sailing behind him, not to overtake his tanker. On the radar screen, set on the 1.5 miles range scale, he saw the echo of the freighter 2º on his port quarter, 850 meters off. Shortly after, he was advised by the Kanmon Martis over the VHF telephone to pay attention to the freighter ‘S’.

2. (-)4 min.
A small vessel, sailing in the same direction on his starboard side, quickly lost speed over the ground, forcing ‘K’ to sail in parallel with her. Therefore, he increased his speed. At the same time, he recognized the freighter ‘S’ was nearing rapidly in an overtaking situation, while sounding one long blast on the whistle. Because the Kanmon Martis had given a warning against him to exercise caution on freighter ‘S’, he did not sound a warning signal believing that the freighter would reduce her speed so as to sail behind him.

3. (-)2 min.
Although he recognized that the freighter ‘S’ had begun to take a sharp sheer to the starboard side, he was unable to take any action and collided with the freighter.

In the Kanmon Passage, keep to the starboard side of the passage!
In the vicinity of Moji Saki, never make a risky overtaking attempt!
- When sailing along the Kanmon Passage and Kanmon Passage 2, vessels are required to sail on the starboard side of the passage as far as is safe and practicable.
- In the Kanmon Passage, vessels are prohibited from making risky overtaking maneuvers or sailing parallel to another vessel. As demonstrated by this case, it is important to refrain from overtaking another vessel in narrow Hayatomo Seto with its tidal current.
- When sailing in Hayatomo Seto, mariners are required not to feel pressed, hurry, or fight the current, but keep a sufficient distance to another vessel ahead.
Among the marine accidents (collisions and groundings) involving passenger ships, freighters and oil tankers, for which judgments were delivered by the relevant marine accident inquiry agencies over a period of five years from 2002 to 2006, 16 collisions (32 vessels) and 14 groundings occurred in the Kanmon Passage and its adjacent waters, lying to the west of the longitude of Ganryu Shima.

By the location of the accident within the area, 2 collisions occurred in O Seto; 4 groundings in waters adjacent to the Sunatsu Passage; 7 collisions and 2 groundings in the vicinity of the junction of the Kanmon Passage and Kanmon Passage 2; 6 groundings around Ai-no-Shima and Shirasu; and 7 collisions and 2 groundings in other waters.

By the time bracket of the occurrence, 68% of the collisions and 64% of the groundings occurred between 2000 hours and 0600 hours.

Of the 16 collisions, foreign-flag vessels were involved in 11 cases! Accidents frequently occur in junctions of passages at night.

In the western section of Kanmon Kaikyo, there are junctions of the Kanmon Passage—in the stretch from O seto (which makes a turn around the south end of Hiko Shima) to waters to the east of Mutsure Shima—with such passages as Sunatsu, Tobata, Wakamatsu Passage and Kanmon Passage 2, which fact requires navigation with considerable caution.

In waters to the east of Mutsure Shima, the Kanmon Passage was extended in length in 1996 and in width in 2002. However, the passage bends sharply in this area, making it difficult for larger vessels over 3,000 gross tons to maneuver. For this reason, the sailing route in the vicinity of the north entrance of the Kanmon Passage 2 has been dredged as a 10 year project since 2005.

Situation of marine accidents in the western section of Kanmon Kaikyo

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(Case Study 3) A small Japanese oil tanker, which was a give-way vessel, collided with a foreign-flag freighter sailing southward along the Kanmon Passage

Summary

While sailing northward along the Kanmon Passage, the Japanese oil tanker ‘D’ detected the Panamanian freighter ‘N’ by radar. However, the tanker did not monitor the movement of the freighter nor did she heed the information about the freighter ‘N’ that the Kanmon Martis gave several times to the tanker by VHF.

On the other hand, when the freighter ‘N’ made a position report to the Kanmon Martis by VHF, upon entering the Kanmon Passage, she received information to the effect that she might approach a small westbound vessel. However, assuming that the westbound tanker would keep out of the way of the own vessel, the freighter continued sailing, without sounding warning signals, and they collided with each other.

The master was conni under the guidance of a pilot.

2,650 meters to the tanker ‘D’
① (-)5 min.
The pilot of the freighter sighted the tanker ‘D’ which was sailing northward. He continued sailing, assuming that the tanker, a small vessel (i.e., 300 gross tons or less) as defined in the Port Regulations Law, would keep out of his way.

1,560 meters to the tanker ‘D’
② (-)3 min.
Although he recognized that the tanker had not responded to calls by VHF from the Kanmon Martis, he did not give any warning signal, assuming that the tanker would eventually take appropriate action to keep out of his way.

1,000 meters to the tanker ‘D’
③ (-)2 min.
Having reached a point of course-alteration to 180º along the bend of the passage, he altered his vessel course to 200º, still assuming the tanker would keep out of his way by steering to starboard.

④ (-)30 sec.
With the tanker closing to a distance of 270 meters, 27º on his port bow, he put the helm hard over to starboard, but to no avail. The freighter collided with the tanker.

3) Immediately before the collision
After observing the freighter closing to the center of the radar screen, he visually sighted her in close proximity. He put the rudder hard over to starboard in a hurry—but in vain. A collision followed.

1,560 meters to the tanker ‘D’
① (-)3 min.
Although he recognized that the tanker had not responded to calls by VHF from the Kanmon Martis, he did not give any warning signal, assuming that the tanker would eventually take appropriate action to keep out of his way.

2,650 meters to the freighter ‘N’
① (-)5 min.
Although the Kanmon Martis had been calling the tanker by VHF, without knowing her identity, the boatswain continued sailing, unaware that the message was addressed to his vessel.

The master of the tanker was resting.

The boatswain was engaged in a single-handed navigation watch.

In Kanmon Kaikyo, the master should take the conn!!

Keep a listening watch on VHF Channel 16

In the highly dangerous environs of Kanmon Kaikyo, a vessel that does not keep a listening watch on VHF may adversely affect many of the other vessels around her.
If you have not turned up the VHF telephone to an audible level, it is as if the telephone is inoperative. You are required to ensure that you keep a listening watch, by checking the installed location and sound volume of the VHF.

In Kanmon Kaikyo, the master should take the conn!!

② Do the other vessel have the intention to keep out of my way or does she not?
Then, I will sound a warning signal!
Summary
The tanker 'H', engaged in domestic trade for the carriage of fuel oil, which was not required to be furnished with international code flags, had the possibility, in the process of sailing out of the Sunatsu Passage, to encounter the Panamanian freighter 'S', which was sailing along the Kannon Passage, but decided to cross the latter passage. On the other hand, the freighter, which was sailing southeastward along the Kannon Passage, recognized the tanker entering the Kannon Passage from the Sunatsu Passage. She continued sailing, while monitoring the movement of the tanker. Although the tanker did not show any signs of keeping out of her way, the freighter continued sailing, without sounding warning signals, and collided with the tanker.

Vessels sailing along the Kannon Passage have right of way over other vessels
(Specified sailing rules)
(Regulations for the Enforcement of the Port Regulations Law, Article 39, Paragraph 1, Subparagraph 7)

In Kannon Port, in the event of a risk of encounter between a vessel sailing along the Kannon Passage and another one sailing along another passage, such other vessel sailing along the other passage shall keep out of the vessel sailing along the Kannon Passage.

The vessel intending to enter the Kannon Passage from another passage should do so after ensuring that she has kept out of the way of other vessels sailing along the Kannon Passage, by, e.g., slackening her speed in ample time.

Never proceed with your plan to cross the passage!

① (-)6 min.
Sailing on a course of 141º, at a speed of 14 knots.

② (-)5 min.
He first sighted a unit of towing boat and a tow 5º on his port bow, 200 meters off, and the freighter 'S' 7º on his port bow, 1,680 meters off.

③ (-)3.5 min.
Assuming the tanker, which was not displaying a destination signal, to be a vessel sailing in the same direction as his own, he put the rudder to port, slightly earlier than otherwise, to steer 112º along the orientation of O Seto No. 2 Leading light.

④ (-)2 min.
He slackened her speed to 'half ahead', sailing along the Kanmon Passage, by, e.g., slackening her speed in ample time.

⑤ Immediately before the collision
Upon receipt of a report from the chief engineer (who happened to be having a meal in the wheelhouse) regarding the closing of the freighter, the master put the helm to starboard, but it was too late to avoid a collision.

⑥ (-)1 min.
He did not want to approach the tugboat towing a large barge on the starboard side.

Never proceed with your plan to cross the passage!

① (-)6 min.
The master initially sighted the tanker 'H' 18º on his starboard bow, 1,310 meters off, sailing out of the Sunatsu Passage. He continued sailing, while monitoring the movement of the tanker.

② (-)4 min.
Course of 053º at a speed over the ground of 11.0 knots, with an easterly tidal current. He continued sailing, while watching two oncoming vessels from ahead, but did not realize there was a risk of collision with the freighter.

③ (-)3 min.
Although he had observed the freighter 78º on his port bow, 770 meters off, upon entering the Kannon Passage, he decided to reach the north side of the passage by crossing ahead of the freighter, in order to avoid interfering with the unit of the towing boat on his starboard bow. For this reason, he did not keep out of the way of the freighter.

④ (-)2 min.
Course of 053º at a speed over the ground of 11.0 knots, with an easterly tidal current. He continued sailing, while watching two oncoming vessels from ahead, but did not realize there was a risk of collision with the freighter.

Why did the master of the tanker, who was familiar with transit through Kannon Port, cause the accident?

① (-)5.5 min.
The tanker 'H' steamed on a course of 051º with 8.5 knots, heading to No. 23 Buoy, with the intention to cross the Kannon Passage to her destination in Shimonoseki-ku.

The master was coming.
The second mate was engaged in lookout and the operation of the telegraph.

② (-)5 min.
He first sighted a unit of towing boat and a tow 5º on his starboard bow, 700 meters off, and the freighter 'S' 7º on his port bow, 1,680 meters off.

③ (-)2 min.
The tanker had continued closing, showing no sign of changing her course, he continued sailing, without sounding warning signals, on the assumption that the tanker would eventually alter to sailing, without sounding warning signals, and collided with the tanker.

④ (-)1 min.
The master was standing a single-handed navigation watch while being engaged in manual steering himself.

⑤ (-)1 min.
He was therefore able to make only small change in course.

The master put the helm to starboard, sooner or later, along the course of the Kannon Passage.

He ordinarily sailed outside the passage except when crossing it. He did not like being overtaken when sailing inside the passage.

He assumed that the freighter would make a course alteration much later along the leading lines.

'S' is approaching, but I will make a crossing first!