



**NATIONAL TRANSPORTATION SAFETY COMMITTEE
REPUBLIC OF INDONESIA**

FINAL
KNKT.15.06.02.03

Marine Safety Investigation Report
Collision between
Panama Registered
Container *LEO PERDANA*
and Indonesia Registered
Gas Tanker *NAVIGATOR ARIES*
Surabaya Western Access Channel, 28 June 2015



2019

FOREWORD

Praise to be given to the Almighty God with the completion of the preparation of the Final Report on the Investigation of the Collision between Panama Registered Container *Leo Perdana* and Indonesia Registered Gas Tanker *Navigator Aries* on 28 June 2015 in Surabaya Western Access Channel, East Java, Republic of Indonesia.

The completion of this Final Report of Marine Accident Investigation was mandated by the IMO Resolution MSC.255 (84) on the Casualty Investigation Code Indonesian, Shipping Act No. 17 Year of 2008 Articles 256 and 257 as well as Government Regulation of Transport Accident Investigations No. 62 Year of 2013 Article 39 paragraph 2 letter c which states that "*The report of transport accident as referred to the verse (1) consists of the final report*".

The report is the final output of the entire investigation process which covers fact information, analysis of causal factors that most likely contributed the accidents, recommendations for prevention and improvement, and appendix of other supporting documents. The report discussed the marine accidents issues about what, how and why the accident occurred and findings about the cause of the accident along with the recommendations of shipping safety to the parties to minimise or prevent recurrence by the same factors in the future. The final report is issued or publicly published after requesting responses and/or feedback from regulators, operators, manufacturers of transportation facilities and other related parties.

The last, but not the least, the Final Report of Marine Accident Investigation was made so that the interested parties could learn and take lessons from the accident.

Jakarta, March 2019

NATIONAL TRANSPORTATION
SAFETY COMMITTEE
CHAIRMAN



Dr. Ir. SOERJANTO TIAHJONO

FACTUAL INFORMATION

The Accident

On 28 June 2015, *Leo Perdana* (LP) was anchoring at around the outer buoy of the Western Surabaya Channel (APBS). She came from Kaohsiung Port, Taiwan and planned to bound for the International Container Terminal (ICT) Port of Tanjung Perak, East Java, but had to wait for the Pilot to get onboard.

At about 22.00 local time¹ (LT), the Pilot of LP (LP Pilot) embarked the LP. Afterwards, the LP began the shifting from the outer anchorage area towards the ICT Port through the APBS. Her heading was 198° T and her average speed was 14 knots. In average, her depth under keel clearance was around 4 metres.

The weather at the time was clear without any fog and no strong wind. The waves were normal.

At about 22.52 LT, another ship named *Navigator Aries* (NA), began the sailing from the Pertamina Gaspier Nilam Port in Gresik, East Java towards the Kalbut Port in Situbondo, East Java. Previously, she discharged all of her gas cargo (liquefied petroleum gas/LPG). Her heading was 015° T and the average speed of 16 knots. On the NA's bridge, there were the Master, helmsman, Chief Officer (CO) and Pilot of NA (NA Pilot). At that time, there were a tug boat *Pahala* which was towing a barge *Serasih 2* on the forward of NA moving on the same direction towards the outer buoy.

At about 23.12 LT, there was an initial communication between Pilot of NA and LP regarding the passing agreement. The LP Pilot asked a question to the NA Pilot about the passing while on the Buoy 11. The NA Pilot answered that the NA had just passed on Buoy 11 by her port side. The LP Pilot then suggested to pass red-to-red. To response, the NA Pilot agreed about it. Later, the LP Pilot suggested the crew on the bridge to slightly steer the course for preparation of red-to-red passing with the NA.

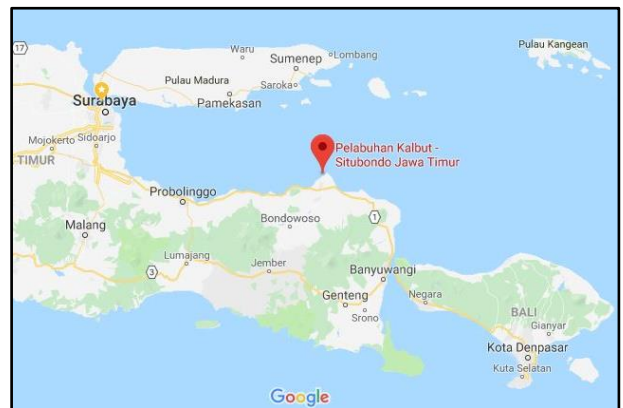


Figure 1: The Kalbut Port (sumber: Google Maps)

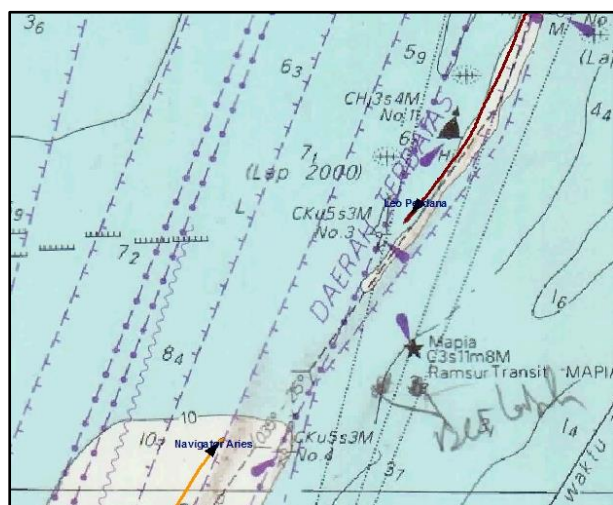


Figure 2: Ships' position at 23.15 LT

At about 23.14 ¼ LT, the *Pahala* asked the confirmation to the LP whether passing still on green-to-green. The LP Pilot answered that passing between LP and *Pahala* stay on the plan (green-to-green).

At about 23.15 LT, the LP approached the oncoming *Pahala* and *Serasih 2* with green-to-green passing agreement. The head-on passing was successfully done without any issue. Right after passing with the barge, the LP Pilot asked the confirmation to the NA Pilot about the red-to-red passing. The NA Pilot confirmed to stay on the red-to-red passing. Accordingly, both ships gradually steered their headings. The heading and speed of NA and LP were at about 045° T/15 knots and 220° T/14 knots, respectively.

At about 23.17 LT, the LP Pilot shouted to the NA Pilot that the rudder of the LP did not work and asked the NA to steer to hard starboard immediately. The LP Pilot asked the AB of LP to

¹ Indonesian Western Time (*Waktu Indonesia Barat/WIB*) is UTC + 07.00.

maintain the midship-steady rudder. Shortly after, the master of LP ordered to adjust the rudder to midship and then to hard starboard.

Some of the crew members of the LP felt that the bow of the ship hit something beneath the water. At that time, the clearance under LP's and NA's keels was around 2.7 and 4.1 m, respectively. Despite the LP's rudder was on hard starboard position, the LP was drifted towards the port side.

At the same time, the NA made an attempt to stop engine to prevent the collision, yet the time was running out. The heading of NA was steered a little bit to starboard side, but the distance between both ships was too close.

At 23.17.52 LT, the LP's bow hit the NA's port side hull. The accident occurred nearby the Buoy 6 and Karang Jamuang Island. A couple of seconds after the collision, the fire spread on the damaged part of NA. At the time, the LP's stem attached to the NA's hull.

At about 23.18 LT, the Master of LP ordered half stern to keep a safe distance from the NA. After the accident, the NA was anchored at 6° 58.947' S and 112° 41.753' E (about 10 nm of Gresik Port).



Figure 3: The initial fire on NA (left); and fire extinguishing on NA (middle and right)

Shortly after, the Pilots on both vessels reported to the Pilot Station and Harbour Master of Tanjung Perak. A crew of NA activated the distress signal through Inmarsat on channel 2187.5 kHz. Following the accident report, there were tugs named *Joyoboyo*, *Bima 306* and *Bima 333* (sent by the Pilot Service, PT. Pelindo) as well as the tug 371 (sent by Coast Guard of Harbour Master of Gresik) were deployed to the accident site. The Local Search and Rescue Agency was also involved to render assistance to crew who jumped to water after the fire on NA emerged.

On the next day, at about 02.20 LT, when the tugs arrived on the NA, the fire completely diminished already. However, the tugs were jetting as much as sea water to cool down the hull to prevent the gas explosion or any unexpected circumstances.

At about 08.00 LT, the jetting halted. All crew of NA then taken by using the Rigid Inflatable Boat (RIB) boat 315 to the shore as the condition of NA was still unsafe. The LP continued the journey by her own power to unload the 2,553 TEU containers at the ICT port.

The Aftermath

The collision made both ships damaged. The NA had a severe torn and burnt approximately 30 metre square width on her tank no. 4 port side. Whereas, the LP got a serious damage on the bow and stem construction.

There was no injuries, fatalities nor environmental impact resulted by the accident. Also, the marine traffic in the APBS had no significant issue due to the accident.



Figure 4: The damaged parts on the LP (left) and NA (right)

SHIP INFORMATION

Navigator Aries

The 159.97-meter (length overall) Indonesian-flagged *Navigator Aries* (IMO 9403762) was built in 2008 by Hyundai Mipo Dockyard in South Korea. She was owned and managed by the Navigator Gas. The 23,333 DWT tanker was classed by the Lloyd's Register. Her maximum draught was 10.9 m.

She was equipped by 2-stroke diesel MAN-B&W 6S46MC-C main engine which produced an output power of 10,540 kW at 129 rpm² to turn one fixed-pitch propeller. Her maximum speed was 15 knots.

Leo Perdana

The 199.93-meter (length overall) Panama-flagged *Leo Perdana* (IMO 9363390) was built in 2007 by Naikai Zosen Corporation in Japan. The ship in which her former name was *Kota Perdana* was owned by Leo Ocean, S.A. and operated by Tokei Kaiun, Ltd. The 33,423 DWT container ship (fully cellular) was classed by the Nippon Kaiji Kyokai. Her maximum draught and depth were 11.276 and 16.600 m, respectively.

She was equipped by 2-stroke diesel MAN-B&W 7S70MCC main engine which produced an output power of 21,735 kW at 91 rpm to turn one fixed-pitch propeller. Her maximum speed was 24.75 knots, while her service speed was 22 knots.

Based on the investigation into the LP's rudder engine, there was no problem either on the rudder or steering systems. The systems worked well and had been proven on her voyage from the accident site to the Tanjung Perak Port without any issue.

Weather Information

Based on the weather information from the Indonesian Meteorological, Climatological, and Geophysical Agency (*Badan Meteorologi, Klimatologi, dan Geofisika/BMKG*), the wave and wind in the vicinity of the accident spot was normal. The wind speed reported various between 2-24 knots, while the waves were between 0.3-1.3 m.

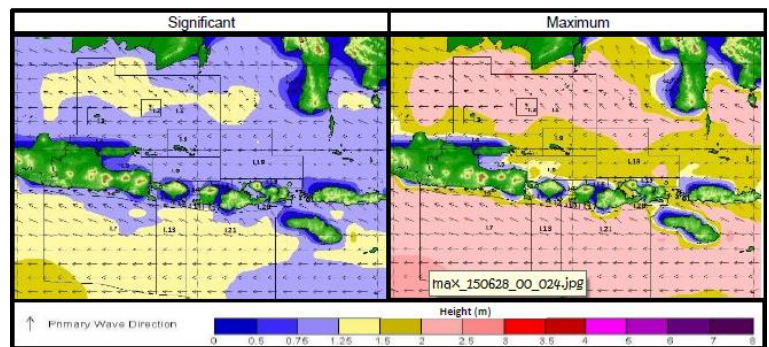


Figure 5: The marine weather report on 28 June 2015

Pilotage Service and APBS

Referring to the Minister of Transportation No. 22/1990, the APBS is categorised as the piloted waters. The dense traffic as well as limited width and depth of the channel make the situation becomes harder. Therefore, the APBS is classed as Class 1 of the piloted waters. Any vessels which GT is 500 or above must be assisted by a Pilot. The pilotage service in the APBS is run by the PT Pelabuhan Indonesia III Branch of Tanjung Perak.

² Revolutions per minute.

The investigator team copied the VDR data from both ships after the accident. Afterwards, the ships' motion, voice record, marine chart and interview record were played into a ship collision simulation to provide the real situation of the accident. In this accident, the causal factors of the collision targeted to the factors made the LP failed to steer the course towards her starboard side to attain the red-to-red passing with the NA, such as the system deficiency or channel issue, as well as the cooperation amongst the crews and Pilots on both ships.

The Failure of Manoeuvring of LP

From the inspection into the rudder and steering systems and the witness acknowledgment, there was no indication of any issues on the systems. In addition, the LP could accomplish the journey to the Tanjung Perak Port on her own engine and rudder. Therefore, the issue on the rudder and steering systems could be eliminated from the possibility factor list.

The external factor was the only factor underlay the failure in controlling the LP. To be specific, the failure on the LP's rudder function was due to the possibility of contact between the LP's bow and shallow object in the water, underneath her. Consequently, the LP was moving to port, despite the rudder had been positioned for starboard turning.

The echosounder record supported this as the cause of the LP's rudder did not work properly. The depth of the APBS was unequal. At some location, the clearance could reach until 32 m Low Water Spring (LWS), then suddenly drop to 6 m, and then 2 m. In the other words, the likelihood that the stern of LP hit shallow water in which made the rudder ineffective to control the ship's course was fairly high.

The Pilot Awareness

Whilst both ships approaching (NA and LP) each other, none of both pilots maintained their awareness in terms of safe speed and the under-keel clearance. Based on the UKC data on the LP's VDR, the UKC was around 4-5 m prior to the collision. Within one minute towards the collision, the lowest UKC recorded was 1.0 m. This situation supposed to be the main concern of both Pilots to inform the both Masters in reducing the speed, instead of kept going with the speed of around 16 knots. Both Pilots should take into account the uneven seabed related to the safe speed to ensure the safety for both ships, even though the Indonesian nautical chart did not show any message regarding shallow seabed in the vicinity of the collision location.

In 2015, the APBS channel was shallower than the new APBS channel nowadays. Years after the accident, the APBS had been well developed. The new APBS channel has now safer depth for big ships. The channel depth is also maintained by PT APBS which would maintain the depth by dredging operation periodically.

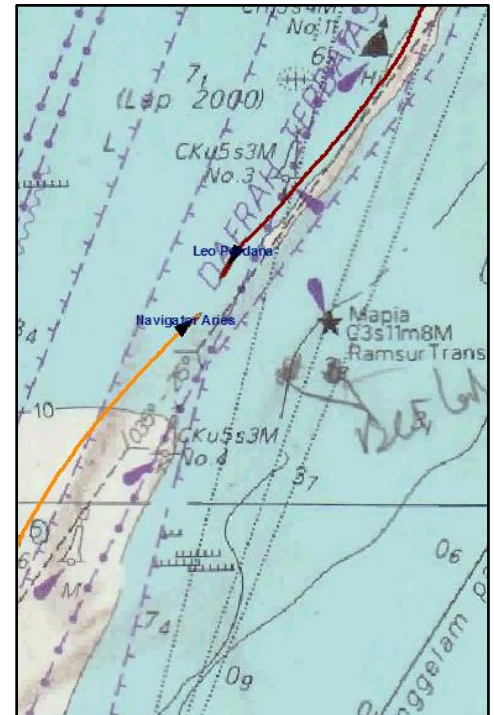


Figure 6: Both NA and LP were approaching each other

The collision between *Leo Perdana* and *Navigator Aries* in Surabaya Western Access Channel, was due to the lack of situational awareness on both ships. This circumstance, further, allowed the *Leo Perdana's* to elapse the shallow water. In this accident, the investigation team found several findings related to the accident as follows.

CONTRIBUTING FACTORS³

- Both ships' speed was more than 10 knots.
- The distance between both ships was less than 2 nm.
- There were some obstacles hindered each ship to alter the course.

FINDINGS

- There was no speed limit on the Surabaya Western Access Channel (APBS).
- The seabed was uneven and some parts were dangerous for big ships.

RECOMMENDATIONS

Based on causal and contributing factors of the collision between *Leo Perdana* and *Navigator Aries* in Surabaya Western Access Channel, the National Transportation Safety Committee (NTSC Indonesia) recommends following matters to interested parties to be applied to prevent the recurrence of an accident by the same factors in the future.

Refer to the Government Regulation of Transport Accident Investigations No. 62 Year of 2013 Article 47 stipulates that the interested parties must follow up the safety recommendations on this report and report the progress of those recommendations to the chairman of the NTSC Indonesia.

HARBOUR MASTER OF TANJUNG PERAK

1. To set the speed limit in the Surabaya Western Access Channel (APBS).

Regarding this recommendation, the Harbour Master of Tanjung Perak has initiated the safety action to set the speed limit in the APBS as well as created a new channel.

Status: Closed

PT. PELABUHAN INDONESIA (PERSERO) III BRANCH OF TANJUNG PERAK

1. To enhance the role of Pilots in providing information as described in the IMO Resolution A.960, particularly about shallow water and make an early necessary communication.
2. To report any significant uneven depth of the APBS to the Tanjung Perak Harbour Master and Navigational District of Surabaya.

Until the final report is issued, the KNKT had not received comments or safety actions yet following the recommendations.

Status: Open

NAVIGATOR GAS

1. To enhance the bridge resource management amongst the ship crews.

Until the final report is issued, the KNKT had not received comments or safety actions yet following the recommendations.

Status: Open

³ Contributing factors are anything which might be the source of an accident. In terms of any act, negligence, condition or situation in which avoided or diminished would prevent an accident or reduce the impacts.

TOKEI KAIUN LTD.

1. To enhance the bridge resource management amongst the ship crews.

Until the final report is issued, the KNKT had not received comments or safety actions yet following the recommendations.

Status: Open

SOURCES OF INFORMATION

Leo Perdana's crew;

Navigator Aries's crew;

Harbour Master Office of Tanjung Perak.

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