



**NATIONAL TRANSPORTATION SAFETY COMMITTEE  
REPUBLIC OF INDONESIA**

**FINAL**  
**KNKT.19.01.06.03**

**Marine Accident Investigation Report**  
**Barelang 2 Bridge contacted by *Eastern Glory***  
**(IMO 8508228)**  
**Barelang Waters, Riau Islands**  
**Republic of Indonesia**  
**23 January 2019**



**2019**

*The report is based upon the investigation carried out by the National Transportation Safety Committee (KNKT) in accordance with IMO Resolution MSC. 255 (84) and Indonesian Shipping Act (UU No.17/2008).*

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1. Indonesian Shipping Act No. 17 Year of 2008, articles 256 and 257 as well as the explanatory memorandum;
2. Government Regulation No. 62 Year of 2013 on Transport Accident Investigations;
3. Presidential Regulation of the Republic of Indonesia No. 2 Year of 2012 on the National Transportation Safety Committee;
4. IMO Resolution MSC.255 (84) on the Casualty Investigation Code.

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## FOREWORD

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Praise to be given to the Almighty God with the completion of the preparation of the Final Report on the Investigation into the collision between Bareleng 2 Bridge and *Eastern Glory* on 23 January 2019 in Riau Strait, Province of Riau Islands.

The completion of this Final Report of Marine Accident Investigation was mandated by 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, May 2019

NATIONAL TRANSPORTATION  
SAFETY COMMITTEE

CHAIRMAN



Dr. Ir. SOERJANTO TJAHJONO

## FACTUAL INFORMATION

### The Accident

On 23 January 2019 at about 13.00 local time<sup>1</sup> (LT), some of the crew members of *Eastern Glory* were in a pre-departure briefing onboard the *Eastern Glory*. She was berthing alongside on the Jagad Energy Port, southern of Batam Island, Province of Riau Islands, Republic of Indonesia. Since there will be another vessel to berth on the port (the port capacity is for one big vessel only), the *Eastern Glory* had to leave the port and bounded for Pasir Gudang Port, Malaysia. There was no cargo on her 14 tanks (7 on each side). All cargo of 3,400 kL high-speed diesel fuel was completely unloaded at the Jagad Energy Terminal. To assist the manoeuvre of *Eastern Glory*, the ship agent had provided two tug boats, namely *Multi Sahabat 7* (planned at the fore) and *Multi Sahabat 6* (planned at her starboard side).



Figure 1: The location of Barelang 2 Bridge and the Jagad Energy port (source: Google Earth)

At about 14.00 LT, the port clearance and other documents of *Eastern Glory* were issued. Shortly after, she was unmoored from the port of Jagad Energy Port. She engaged her engine for a short time to move forward. Afterwards, the Master ordered to stop the engine. At initially, the only tug assisted her was *Multi Sahabat 7* on her starboard side, while *Multi Sahabat 6* was waiting next to the Barelang 2 Bridge. As her heading was facing towards north, she was planned to move straight southernly by her own engine and then to be rotated (anticlockwise) by the two tugs. All crew members were in their positions. The voyage plan and waypoints were set.

At the time, the speed of north wind was around 10-15 knots. The lookout was clear and weather was relatively sunny. Refer to radar information, the current was low tide with the strength of current was about 5 knots (northernly).

However, when the *Eastern Glory* was in an attempt to rotate towards south (anticlockwise), *Multi Sahabat 7* could not complete their task. The *Eastern Glory* was drifted uncontrolled to approach the bridge. Realising the situation, the Master ordered to drop the port side anchor and to operate the main engine. The Master instructed the crew to rotate the ship by her own engine to make her heading parallel to the Barelang 2 Bridge. At the same time, *Multi Sahabat 6* came towards the *Eastern Glory* to push her. Two tug boats, then, were pushing *Eastern Glory* to away from the bridge.

The engine of *Eastern Glory* took longer time to start. The engine finally operated few minutes before her upper structure of *Eastern Glory* contacted the structure of middle pillar of the Barelang 2 Bridge. Parallel with the time of main engine start, the Master ordered dead slow ahead. A couple of seconds later, before the engine was ready to give a response, the Master ordered slow ahead. After the contact, the main engine turned off by itself.

After the contact, several attempts to push the *Eastern Glory* was unfruitful due to the strong current and the tug boat which has bigger power was still underway to the accident site.

After the dark, the *Eastern Glory* was towed and berthed back to the Jagad Energy port.

<sup>1</sup> Western Indonesia Time (Waktu Indonesia Barat/WIB) is UTC +07:00.

### **The Aftermath**

As the result of the contact between the *Eastern Glory* and the Barelang 2 Bridge, her upper structure had a major damage. Some parts of the upper structure were underneath of the bridge.

Nonetheless, the damage on the bridge was still unknown as the damage assessment on the bridge is still ongoing by the BP Batam (local government of Batam). From the visual inspection on the road of the bridge which was taken by the investigator team, there was no visible crack or any damage on the road side. It was unknown whether invisible parts were impacted by the accident, particularly on the base of the pillar. Until this investigation report is published, the KNKT did not received any damage report from the BP Batam, although the KNKT has asked for the document.

At the initial of the occurrence, the *Multi Sahabat 7* was in between the *Eastern Glory* and the bridge pillar. Luckily, the *Multi Sahabat 7* did not have any serious damage because the upper structure of the *Eastern Glory* held her in position, so that the *Multi Sahabat 7* was not pressed by the *Eastern Glory* towards the pillar.



**Figure 2: Eastern Glory hit middle pillar of Barelang 2 Bridge**

### **Ship Information**

#### **Eastern Glory**

The *Eastern Glory* (IMO 8508228) was the Ulaanbatar (Mongolia) registered oil tanker. The steel vessel was built by Hudong Shipyard in Shanghai, China in 1986. Her length overall, breadth extreme and maximum draft were 107.42, 15 and 6.4 m, respectively. Her summer freeboard was 1.41 m.

The ship which formerly name was *Jian She 5* until 2007 was owned by Grand Ocean Shipping Line Inc. In 2007, she had a modification. Since 2018, she was operated by Jin Hao Ship Management Co. Ltd. She was classed with Singclass International.

The *Eastern Glory* had the anchor bar system on her main engine. The engine system without gear box needs about 30-60 seconds to start. Her engine was 1 unit of 2 Stroke engine 5L35MCE with the output power of 2,501 kW (3,400 HP) at 200 rpm which generates service speed of 12 knots.



**Figure 3: Eastern Glory**

In 2014 and backwards, the *Eastern Glory* had many defects found by the Port State Control (PSC) officers. All of the inspections were carried out in Indonesia and China in the different ports.

#### **Crew Members**

There were 19 crew onboard the *Eastern Glory* which comprised of 11 Indonesians, 4 Burmese and 4 Srilankans.

The Master joined in the company of owner of *Eastern Glory* since 2012 as the Master. He began his career as the seafarer since 1979. He was onboard the *Eastern Glory* one day before the departure day as the previous Master asked

to off from the ship. Both Masters were the first time in Barelang Waters. The previous Master felt uncomfortable to be onboard after the ship had been detained for more than three months without proven allegation.

The Chief Officer joined on the *Eastern Glory* in September 2018, right before the journey of *Eastern Glory* towards Batam. He began his career as the seafarer since 2001. He had an experience in working on another tanker before worked at the *Eastern Glory*.

## Tug Boats

Based on the interview, the Master of *Eastern Glory* did not know the power of both tugs until the accident occurred. The Master trusted the agent in providing those tugs. *Multi Sahabat 6* had power output of 350 kW, while *Multi Sahabat 7* had 340 x 2 or 680 kW in total. Both tugs were owned by the Jagad Energy.

However, referring to the agent, the Master had been told about the power of both tugs in the briefing session.

Compared to the tug boats which assisted the *Eastern Glory* while she was coming to Jagad Energy Port in September 2018, there was a significant difference. The tugs which were owned by another company on that time had much bigger power.

## Barelang Bridges Information

There are 6 Barelang Bridges built for six years (1993-1998). The total length of all bridges is around 54 km. Barelang stands for (BATam, REmpang, dan gaLANG) which are some name of islands connected by Barelang Bridges. They connect Batam, Tonton, Nipah, Rempang, Galang and Galang Baru Island. Initially, those bridges were aimed as business facilities for those islands, so that the industries will grow up easier in the Riau Islands area. Since they were built, Barelang Bridges have been the icons of Batam. All Barelang Bridges, which the total length is 53.65 m, are now under ownership and maintenance of BP Batam, even though they were built by the Central Government.



**Figure 4: Barelang 2 Bridge (Image: HERE)**

The Barelang 2 Bridge, which the formal name is Nara Singa Bridge, is stretched 420-m and made in cantilever box type. Compared to the Barelang 1 Bridge, Barelang 2 Bridge is smaller with the width only 18 m. Barelang 2 Bridge connects Nipah Island and Tonton Island. The existence of the Barelang 2 Bridge was far before the development of ports in the surrounding of Barelang Bridges.

As the initial design, all bridges have no protection from the risk of ship collision, such as bridge fenders. Compared to the Musi Bridges in Palembang, the marine traffic in Palembang is higher than in the surrounding of Barelang Bridges.

The analysis will focus on the the decision taken in departing the *Eastern Glory*. This will also discuss about the location of the port towards the bridge as well as the need of pilotage service in the area.

### Decision of Departure

Referring to the Minister of Transport regulation No. 57 Year of 2015 on Piloting and Towing, the minimum power to tow a ship which the length between 70 and 150 m is 2,000 horse power<sup>2</sup> (HP) on at least one unit of tug boat.

At the time of accident, the *Eastern Glory* was assisted by two tug boats. However, both tugs only produced the total power of 1,400 HP. None of them had the power more than 2,000 HP in towing works as required by the Minister of Transport regulation No. 57 Year of 2015. This insufficient power then led to the failure of towing whilst the the *Eastern Glory* was pushed by the current.

The current at the accident was categorised as normal, not as very strong as described as some mass media, even though it was low tide current. This was confirmed by the shifting movement of tug boats had been done without any issue while they were attempting to deter collision between the *Eastern Glory* and the bridge.

The pre-departure briefing did not discuss details about the tugs. The Master did not ask the details of tugs; power and the ship agent did not tell about it. This circumstance then created over trust between agent and Master in selecting the appropriate tug boats without any cross check. As there was no Pilot involved in the manoeuvre, the Master should ask to the agent, despite the agent did not tell the Master to ensure the shifting from port to the channel would be done safely. Should the Master knew about the power of both tugs in advance, the Master had a right to refuse those tug boats and ask for better tugs. The decision to depart the Jagad Energy reflected the over confidence in the Master. He took for granted all preparation which had been done by the agent without any further checking.

To manoeuvre the ship safely, the Master of the *Eastern Glory* should consider a couple of things. First, the Master should ensure that the current was not flowing towards the bridge. Second, all of the tugs were attached on the *Eastern Glory* to ensure they could push in time. Based on an amateur video as seen in Figure 5, there was only one tug assisted the *Eastern Glory* at the beginning of the shifting. Another tug appeared late when the situation became worse.



Figure 5: Multi Sahabat 6 (red circle) Multi Sahabat 7 (yellow circle)

<sup>2</sup> 1 Kilo Watt equals 1.35962 Horse Power.

Likewise, the Jagad Energy Port should have a detail procedure of berthing/unberthing a ship. It should explain detail items should be done by the crew members and ship agent, including some considerations to make a decision of unberth. By doing this, the insufficient power of tugs is expected to be prevented.

As per Minister of Transport regulation No. 20 Year of 2017 on Special Terminal and Terminal for Own Business, the Jagad Energy Terminal was not ruled about the departure and arrival of a ship to its port. As the consequence, all risks of the ship operation is on the burden of the shipowner and the owner of the terminal. Therefore, the decision to select the tugs was unclear. This situation needs further a tailor-made-procedure on how the Special Terminals equipped by it's own procedure in ensuring departure and arrival processes would be safe.

### ***Terminal and Bridge locations***

In regards the Barelang bridges, currently there are 6 bridges built in 1997, including the Barelang 2 Bridge which had been contacted by the *Eastern Glory*. Those bridges have the main function to connect all small islands to Batam island. Without those bridges, the economy and other sector would be slower than with the bridge.

The distance between the port and bridge was insufficient for a big ship such the *Eastern Glory* to manoeuvre. From the measurement, the distance between them is about 200 m. With the length of *Eastern Glory*, she only needs only 1.3 minutes to drift pushed by the current without using her engine at all. Considering at the accident time she was initially moving towards the bridge to make a U-turn, this gave her a dangerous initial speed. Further, the failure of tugs' power and the short distance combined in resulting the accident.

Looking at the site locations of Jagad Energy port and other special ports in surrounding the Barelang Bridges, there is a substantial need to review all licenses related to their locations. The location of those ports for big ships are the real hazard for the existence of the bridges.

Looking back to the historical of bridge erection, those bridges have been existing longer than those port industries in surrounding the bridges. Therefore, as the role is extremely important, the local government should rethink about all hazards and risks in surrounding of all bridges.

### ***Pilotage Service***

Currently, the waters around the Barelang 2 Bridge is not categorized as mandatory of pilotage service. Therefore, there is no compulsory to use the pilot and tug assistance in inbound or outbound ships. It is common for those private companies to engage any tugs by their own decision, although the power is not considered as a main point.

Based on the Minister of Transport regulation No. 57 Year of 2015 on Piloting and Towing, the waters situation in surrounding of the Barelang 1 and 2 bridges should be categorised as must use pilotage and towing assistance. At this stage, the Minister of Transport should decide those services as a compulsory for the safety of marine traffic.

The Pilot service and the VTS service cannot be separated. As the consequence, if in the near future this area defined as the pilotage service area, the coverage of the Batam VTS station should be extended to cover Barelang bridges waters. Therefore, more VTS towers and navigational equipment should be erected in nearby of bridges.

### ***Other Safety Factors***

#### **Voyage Data Recorder**

The voyage data recorder (VDR) is a compulsory equipment for ocean-going vessels based on IMO Resolution A.861(20) on Performance Standards for Shipborne Voyage Data Recorders (VDRs) adopted on 27 November 1997<sup>3</sup>. Accordingly, international voyage ships, such as the *Eastern Glory*, should be equipped by the VDR.

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<sup>3</sup> Revised by IMO Resolution MSC.214(81) adopted on 12 May 2006 and IMO Resolution MSC.333(90) adopted on 22 May 2012.



However, the investigator team has found the *Eastern Glory's* VDR in unsatisfactory condition. The button panel was concealed by whiten plastic cover. Some parts of main circuit were rusted. The battery of underwater acoustic beacon was expired since 2016. The storage media (compact flash) did not work.

From the investigation taken by the team, there was no exemption released by either flag state, coastal state of occurrence or coastal state of the departure port. From this point the ship breached the Regulation 18.8 of SOLAS Chapter V which requires that:

*The voyage data recorder system, including all sensors, shall be subjected to an annual performance test. The test shall be conducted by an approved testing or servicing facility to verify the accuracy, duration and recoverability of the recorded data. In addition, tests and inspections shall be conducted to determine the serviceability of all protective enclosures and devices fitted to aid location. A copy of the certificate of compliance issued by the testing facility, stating the date of compliance and the applicable performance standards, shall be retained on board the ship.*

From those description, the Master should report this condition and then Local Harbour Master should ensure that the VDR of international voyage ship is equipped by a VDR in good condition. The Local Harbour Master could delay the issuance of the Port Clearance until the VDR is in satisfactory condition. In fact, the *Eastern Glory* could obtain the port clearance, regardless of the condition of the shipborne voyage data recorder.

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## SUMMARY

The contact between Barelang 2 Bridge and the *Eastern Glory* was due to the incorrect decision in selecting tug boats to assist the *Eastern Glory* whilst manoeuvring as well as the current situation. In this accident, the investigation team found several findings related to the accident as follows.

### **Contributing Factors<sup>4</sup>**

- The waters in the vicinity of Barelang bridges had no compulsory to be assisted by Pilot and tug boat.
- The distance between the Jagad Energy terminal and Barelang 2 bridge was too close for the *Eastern Glory*.

### **Findings**

- The Jagad Energy terminal did not have the procedure of berthing/unberthing.
- The other port industries are growing in the vicinity of Barelang bridges.
- None of the Barelang Briges are equipped by bridge fenders.
- Insufficient pre-departure briefing.
- The condition of VDR which did not work for years was not reported to the Local Harbour Master.

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<sup>4</sup> 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.

## RECOMMENDATION

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Based on causal and contributing factors of the contact between Barelang 2 Bridge and the *Eastern Glory* in Riau Strait, the National Transportation Safety Committee (KNKT) recommends following matters to interested parties to be applied to prevent the recurrence of an accident by the same factors in the future. According 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 KNKT.

### **MINISTRY OF TRANSPORT**

#### **DIRECTORATE GENERAL OF SEA TRANSPORT**

1. To review the need of Pilot and tug assistance in Barelang waters.

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

**Status: Open**

### **BADAN PENGUSAHAAN BATAM**

1. To review all industries in the vicinity of Barelang bridges which emerge hazards for the bridges.

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

**Status: Open**

### **JAGAD ENERGY**

1. To establish the procedure of berthing and unberthing vessel.

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

**Status: Open**

### **JIN HAO SHIP MANAGEMENT Co. Ltd.**

1. To ensure the crew members conduct the pre-departure briefing correctly with sufficient information.
2. To ensure that the Master always checks the adequate power and readiness of tug boats in shifting assisted by using tug boats.
3. To ensure the voyage data recorder (VDR) on the international voyage vessel is fitted and works properly.

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

**Status: Open**

## SOURCES OF INFORMATION

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Crew members of *Eastern Glory*;

Management of Jaticatur/Jagad Energy.

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