

OPTIMIZATION SHIP MANEUVERS DURING BAD WEATHER WHEN CROSSING SHIPPING LANES NARROW CHANNEL OF BARITO RIVER AT SPB. LAIS

Fiagiv Ferdinand Saputra^{1*}, Wahyu Wibowo¹, Indah Nurhidayati²

^{1,2} Nautical Study Program, Polytechnic Knowledge Semarang Shipping

*Email: fiagiv.saputra@gmail.com

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ABSTRACT

This study aims to explore how to optimize ship maneuvers when traversing the Barito River's small shipping channel in bad weather. Researchers have observed that when a ship turns through a bend in the narrow Barito River channel, particularly in inclement weather, there are frequently hazards or undesirable things that occur. This is because the duty chief on board failed to pay attention to the direction and strength of the current, which caused the ship's stern to be carried away by the current, closing the channel. This study's qualitative descriptive methodology is based on facts experienced by the researchers on board and generates data directly from the research location. Direct interviews with research participants, literature and documentation studies, and observation are the methods used in this instance to get data about the object. According to the findings of this study, ship movements during inclement weather while traversing the Barito River's tight channel at SPB. LAIS. Manoeuvring errors resulting from the duty chief's carelessness are the primary reason of the ship's difficulties. In order to ensure that the voyage proceeds safely, effectively, and efficiently, the researcher recommends that the duty chief be more cautious while on duty and learn the proper technique for crossing the Barito River to prevent navigation dangers.

Keywords : Barito river, bad weather, maneuvers ,narrow.

INTRODUCTION

The maritime shipping sector is always looking to increase cost competitiveness and efficiency, especially in light of rising costs and fierce competition. Improvements in cost and performance, however, must not compromise the safety of the crew, cargo, or ship. It is believed that voyage planning is crucial for ensuring the safety of marine life, safe and effective navigation, and environmental preservation. The categories of voyage optimization and weather routing, as well as the fundamentals of voyage planning. Purwantomo (2018) claims that edited motion boats are a method of moving boats from one location to another in a way that is efficient, effective, and safe for carrying out an activity with the use of internal and external exercises. This means that the motion boat can be implemented quickly and that it uses fuel-efficient materials to prevent potential risks. According to Narto et al. (n.d.) the process of motion boat is the ability to control and dominate the movement boat in a condition of movement, and also not move to carry out the most efficient shipping possible with the use tools navigation ship, rudder, and means others. Because of the characteristics of various types of boats that are different from observing in a way persistent later prophet will be accustomed and more knowledgeable about exercising motion in accordance type of his ship (Ogilvie, 1964).

To make it easier to exercise movement in water river so be built type of boat, Self-Propelled Barge (SPB). This SPB ship is usually known as a motorized barge because its construction resembles a barge. However capacitated machine parent powerful and simpler than using a barge pulled by a ship postpone (Ast Nugraha & Hasanudin, 2018). So, this boat type this far more efficient in maneuvering.

When the weather currently not good enough boat type this can be reliable for across the channel to cruise narrow Barito River. According to Ihsan et.al (2017) said the waters of the Barito River are one of the river longest and largest for sailors local with wide not enough more than 650-800 meters and has an average depth of 8 meters. The Barito River is quite narrow for test the abilities and mentality of the sailors. So it is important optimization maneuver boat experienced by the author himself moment carry out practice sea on the SPB LAIS ship in August 2022. The SPB LAIS ship itself own long 112.50 meters and 28.00 meters wide with draft less more than 8.50 meters when across lane cruise narrow Barito River, South Kalimantan.

In the report November 2022 SPB ship. LAIS enter the Jambu Village area, where there is bend sharp. When the ship will diverted with condition weather very heavy rain so that distance very clear vision limited and completely trust ability radar plotting in observing the water boundaries around ship, but with spontaneous stern boat hit by the current the torrent that makes bow boat to rotate to right so that almost cover half channel river. Captain quick take action maneuver with machine step back full and cikir left then helped with bow thruster right full so that bow boat return to position safe because if late a number of minute just possible ship bulb will run aground moreover before, remembering channel the river is narrow and there shallow water surface. On the event said, captain give a message to guard officer for more focus on observation wide when navigate, estimate fast current from upstream, speed wind and distance safe boat from edge flow. Events the actually almost the same with incident MV Ever Given ship in 2018.

When the MV Ever Given ship crossed Suez Canal departs from Tanjung Panjang Port, Malaysia to Rotterdam, Netherlands then hit by wind tight so that bow boat turn to right and caught on the edge mainland because of ability the squeak from steering already no capable withhold bow the ship that has been sunk drifting to right. Then another event is accident ships in the West Surabaya Shipping Lane in prone to time in 2013 to 2017 which is none other than because factor error communication between ships and negligence man that is delay when maneuver so that direction bow boat no succeed changed towards safety for avoid collision. The number of case accident consequence not enough optimal maneuver boat need attention in a way seriously, especially on SPB ships. LAIS is a place writer carry out practice sea. So that study this aiming for know factor causes, impacts and efforts optimize maneuver SPB ship. LAIS when weather bad moment across channel cruise narrow (narrow channel) Barito River.

Shipping route refers to waters that have adequate depth, width and smoothness for passed by ship when at sea, river, or lake with safe without obstacles. According to Ginting (2022) cruise channel narrow refers to the path limited waters, where ships sailing in the area the required For follow the path that has been set on the flow voyage, or is at on the edge waters on the side right ship, with ensure safety and eligibility shipping.

Before review about condition weather bad, important for understand what understanding weather. Weather referring to the situation or condition air formed during the period certain in a area (Koetse & Rietveld, 2009). Weather characteristics can be changed with prone to time short with started by change between day and night (Seneviratne et al., 2012). In general, condition weather bad tend related with pattern distribution climate, where the event occurs extreme usually happen in not enough from 5% distribution overall. Weather type bad is greatly influenced by location latitude geographical, topographic, elevation and conditions atmosphere (Barry & Chorley, 2009).

According to PP Number 31 of 2021 concerning sailing, explanation boat that is as water transportation which has various types and forms, can moved by force wind, power mechanics, or energy others, withdrawn and also postponed, involving vehicle with power support dynamic, transportation below water surface, means float and structure floating that does not own ability move. According to with provision Article 309 paragraph (1) of the commercial code, the concept of ship includes all means for sail without look at nature and name, including therein sunken ship, engine dredge mud, machine for suck up sand, and tools floating carrier other.

Barge is water transportation that can bring various load and usually pulled by ship delay (Salazar-Domínguez et al., 2021). Barge has sufficient Block Coefficient (BC) high, almost approaching 1, then from that produce significant detention (Hekkenberg, 2013). Although own draft or relative load small

for waters river or canal, barge has wide shape for increase its stability (Paleo et al., 2000). However, the weakness barge lies in its ability for maneuver because its large size. Barge model design dedicated for bring load certain like sand, coal, wood, and so on (Brodie, 2015).

According to the definition contained in the Big Indonesian Dictionary, the term maneuver refers to the series action purposeful active and passive control movement ships at sea and in port. The maneuvering process boat involving a series step for arrange position, speed, attitude, and directing it going to objective certain with safe, efficient and effective. This is involving understanding about system steering wheel ship, engine parent, characteristics maneuver a ships (House, 2007), and factor natural like condition current and capacity boat for recover return after happen slope because encouragement wave or reason external other (Byrnes & Dunn, 2020). Weather routing is one of the best operational strategies to maximize ship travels (Rehmatulla, 2014). Ship weather routing systems usually strive for optimum safety or least fuel costs or trip time by optimizing route and speed throughout a voyage.

According to Poerdwadarmenta (2014), concept optimization refers to achievement results that meet hope in a way effective and efficient. In other words, optimization can interpreted as business for increase superiority from a things that have happened there is and also make something with the most effective and optimal way.

METHOD

Research methods used is qualitative descriptive. Research this carried out at SPB LAIS on August 18, 2022 to August 18, 2023. This ship owned by PT. Maritim Barito Perkasa. Source of research data this are primary data and secondary data collected from technique data collection which includes observation, interview, study library and documentation. Informant study this is Captain, first mate, and second mate. Research this analyzed with fishbone diagram as showed in figure 1. and validated through triangulation. This study employed triangulation in an effort to confirm the accuracy of the data. Researchers want to get a more complete and accurate picture of the phenomenon they are studying by contrasting information from the literature and documentation with the findings of firsthand observation. Triangulation is a way of testing the veracity of data by gathering information from multiple sources (such as observations, interviews, and documents) and applying multiple techniques (such as content analysis and comparison). Scientists might boost their trust in their research findings by comparing these data.

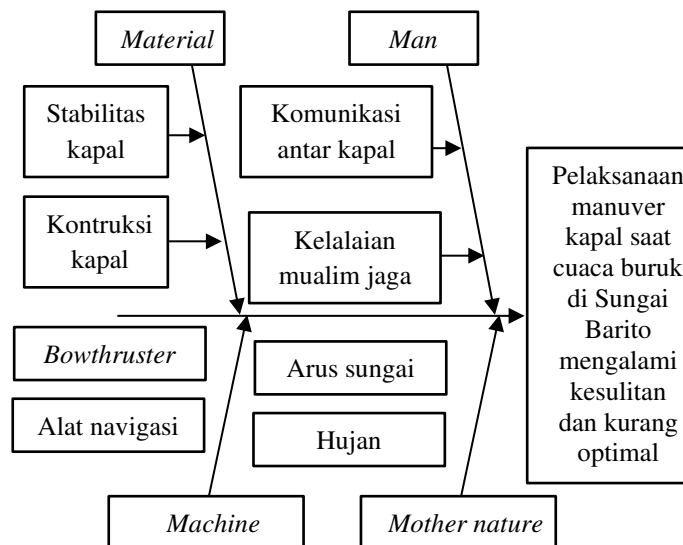


Figure 1. Fishbone Diagram

RESULTS AND DISCUSSION

The difficulty Ship Maneuvers During Bad Weather Crossing the Narrow Channel of the Barito River at SPB. LAIS

From the fishbone diagram (figure 1) known factors that cause the difficulty maneuver boat when weather bad moment across channel narrow (narrow channel) Barito River includes:

a. Man

Human factors is the most important factor or most influential between other factors, things this due to because human being on duty and at the same time responsible answer in activity maneuver boat in a way directly. There is factor human being that influences maneuver boat when weather bad moment across channel narrow Barito River is knowledge maneuver ships and communications with another ship. Implementation process maneuver boat when weather bad moment across channel cruise narrow (narrow channel) Barito River in SPB LAIS is not yet optimal also because negligence the guard officer in to do observation around can result in loss. Negligence this in maneuver this due to because a long time ago a mualim joined on boat no focus in observe (look out) and take into account the river current coming from stern, so that happen failure when boat want to turned on the bend. To to overcome problem this required accuracy the cleric keeps gadgets away and keeps them away when across bend.

When crossing channel cruise narrow (narrow channel), communication with incoming and outgoing ships very much important for do exercise motion moment will pass and overtake other ships. Communication with another ship is done for know in which area the ship is will meet and prepare exercise the movement that will done moment boat will follow or cross paths. Communication with this other ship is also for get and give information about condition waters that will passed by ship. Usual information obtained is incoming and outgoing ships, conditions waters.

b. Material

Material factors that influence maneuver boat moment crossing the Barito River includes construction ships and stability ship. SPB ship. LAIS was made special for pass waters narrow and shallow interior. Built with a barge-like model that is usually pushed or pulled by ship delay, SPB ship has load below loaded ships in general so that allow for pass shallow waters, with wide boat reaching 28 meters of ship can load 12,000 MT of coal with average load at the moment pass Barito River 5.80 meters. Usually SPB ship built with form bow resemble spoon and tend blunt so that boat this tend experience difficulty in maneuvering and the current in the Barito River is very strong and hinders rate boat so that cause difficulty for do maneuver.

When will enter waters interior stability boat must be noticed for make it easier exercise motion moment pass shallow and narrow areas. When you will crossing waters interior the first teacher must notice stability ship. When crossing the Barito River several times it was done arrangement stability because in the areas certain require guard officer for arrange loaded ship to avoid from accident . At the time loaded changed of course ship trim change and stability will also change that will influence maneuver ship. Incident this researcher experience moment boat will entering the Barito River is done ballasting for lower loaded boat because condition shallow waters and when boat researcher will past under Barito bridge is done ballasting for tank ballast number 2 left and 2 right, so boat bending over. This is done so that the lights navigation on the bow no stuck on the bridge. After boat pass bridge ± 15 minutes return done de-ballasting tank ballast number 2 left and 2 right for return ship under load moment before done ballasting. During the process before and after pass Barito Bridge trim changes will also be change stability boat so that will influence maneuver boat

c. Mother Nature

Factors that influence maneuver boat moment crossing the Barito River is factor nature that encompasses current, ebb and flow, condition waters, winds, and weather. Currents when across channel Barito River shipping greatly influences maneuvers on the ship, because due to encouragement very strong current on the bow will make maneuver boat slow down if oppose current and vice versa maneuver will the more fastly if boat one way with current so that moment will maneuver pass bend direction opposite and unidirectional currents own method different maneuvers. This is required guard officer for know read direction currents and maneuvers that must be done for avoid danger. When

researchers do practice at SPB. LAIS thing this always done if will entering the Barito River. Strong current usually happen moment season flood simultaneously when the tide is high ebb whereas current weak happen moment season drought simultaneously with high tide. In the case of moment boat researcher experience difficulty maneuver boat when weather bad moment across channel narrow (narrow channel) Barito River in SPB. LAIS, factor the main thing is strong current from upstream river so that boat carried away current result in boat difficult for maneuvered. The guard officer is less notice strength and direction current.

In carrying out maneuvers on the tidal Barito River will influence maneuver boat because of current the default make boat difficult for carry out maneuvers that require the guard must be on duty take into account the ebb and flow for anticipation maneuvers that will be done if high tide occurs or recede and take profit from tidal event said. So, from that the guard must be on duty understand book tide table and take into account the area to be passed at the time there is a high tide or ebb and flow the movement that must be done.

The ship is sailing throughout waters narrow (narrow channel) such as Canals, straits, and river, then boat will influence squat effect. Squat effect is condition hydrodynamics that arise when a boat sail with speed high in the waters shallow. In the condition this, movement boat cause water to move with fast, productive pressure low in areas where the surface the water more lows. Squat effect occurs if boat approach shallow and felt waters changes in the basis waters. The most appropriate action For reducing squat effect is with reduce round machine on the telegraph ship, then mark squat changed around a quarter speed water vessel.

Condition wind at the time crossing the Barito River will influence boat for exercise motion because size enough ship width and when boat in condition tampa ship's hull load it will be very easy get pressure from wind. In the case of this strength wind can become profit boat for exercise motion but also will harm if the guard officer is not known from where direction wind the.

Weather in case this is rain torrential so that reduce distance view and make it difficult a guard officer for exercise motion. On the weather rain torrential radar usage is also lacking maximum because influence rain will fade away image on the radar screen so will difficult very predict the path that will be passed and the ships that approached. This very much influence when will exercise movement in areas that are not known channel waters that are passed and very vulnerable happen danger collision and danger run aground.

d. Machine (Equipment)

On the bow thruster required a Controllable Pitch Propeller (CPP) unit is required for reverse rotating back on the propeller mentioned. In SPB. LAIS bow thruster is very influential for help carry out maneuver boat like when SP. LAIS will across a bends and sterns boat carried away current result in boat cover channel and ship No under control Then with help bow thruster boat with easy return to position back and can controlled. Here is another example of utility bow thruster for example moment the change condition of the ship's hull, weather bad, entering waters shallow, and helpful boat berthing.

Ship Maneuvers During Bad Weather While Crossing the Narrow Channel of the Barito River at SPB. LAIS

The ship turned around a bend in the channel cruise narrow (narrow channel) own risk big and consequential, then required effort reduce risk even to eliminate it, namely in the first two ways, on time method taking bend there is difference whether bend that sailed with oppose current or follow current as showed figure 2. When against current we as much as possible sailing on the bend adjacent side outside with thus boat will make circle more turns / turns big so that is at far diverted outside, and during water will spin flow appropriate from face. Second, when boat move follow current so as much as possible take up more area close to the side bend adjacent in, during loaded ship and water depth permit, if current this strong so when boat follow bend side outside will result in stern carried away current and can happen risk run aground. After estimate and know direction and strength current, next for carry out

maneuver when weather bad in the groove narrow (narrow channel) is with increase supervision around because vision looks limited due to rain heavy.

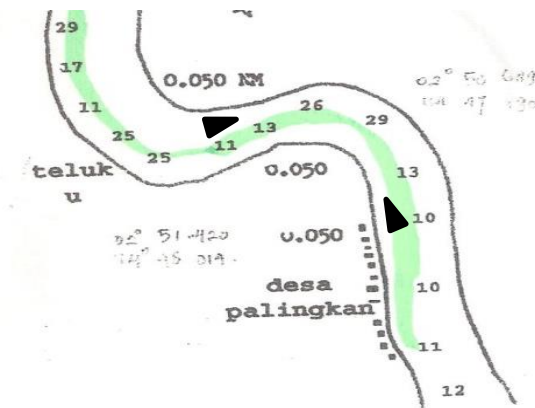


Figure 2. Illustration Ship Condition When *Passing* a Bend
Source : Documentation research (2022)

What Optimization Efforts Are Undertaken to Improve Ability SPB. LAIS Ship Maneuvers During Bad Weather While Crossing Shipping Lanes Narrow (Narrow Channel) Barito River

Based on results interviews obtained, researchers get more optimal steps efficient that required supervision in a way directly so that the maneuver process walk fluent in accordance with existing procedures, because if only through order just, big possibility crew boat not yet of course carry out rules made with should be. So, it is necessary additional from office use support optimization this can structured from aspect implementation.

Other efforts that can be made implemented is give action firm or punishment to the crew that did negligence in maneuver, because some kind of accident this it can be very fatal if control boat no can mastere full. Negligence man or human error this reflect negligence not quite enough answer the guard officer who should be no done with whatever the reason. So that existence regulation this can give effect deterrent until consequence termination connection work (PHK).

From several optimization that has been done explained, required prevention from beginning with stage reception crew in a way strict and transparent, with apply a number of tests in accordance standard competence sailors are needed. Because still heard recruitment process fraud with a family system alibi, so quality sailor accepted can influence performance they in work on boat such as the ISM Code understanding (Arrafi et al., 2023) dan safety work (Hendrawan, 2020). This process the same importance with a number of effort above, because with fairness reception can build professionalism work and only ability that can help career next, with this losses that can occur arise because lack of performance crew can resolved (Suswati & Aliudin, 2019). The master may make any professional judgment-based decisions that are advantageous for the marine environment and the safety of marine life (IMO 2009c).

To ensure safety of life at sea, safe and efficient navigation and environmental protection because voyage planning is deemed essential for safe navigation and the avoidance of hazardous situations, which are covered in Chapter V Regulation 34 of the International Convention for the Safety of Life at Sea (SOLAS), a ship weather routing system can optimize a voyage based on meteorological and oceanographic information (IMO 2009c). Every ship's journey must be planned using the relevant nautical publications and charts, as well as IMO requirements, to guarantee both safe and effective ship navigation.

CONCLUSION

Consequence negligence in maneuvers carried out by the officer on duty above SPB ship. LAIS at the moment river current is sufficient torrential when weather currently bad, so stern the ship is very easy carried away strong current if strength machine already no capable oppose his encouragement moment maneuvering in the groove cruise narrow (narrow channel) Barito River. Other factors also influence because construction bow ship shaped like spoon so that not enough effective compared to with type bow a pointed ship, if used for to split the incoming current. This is impact on the course boat turn with fast and almost close part channel voyage, so that impact on losses time travel or effectiveness in cruise moment across channel narrow (narrow channel) Barito River on the SPB ship. LAIS. So that things the no happen back, then must to uphold action firm with a little threaten for give effect deterrent and reduce a error.

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