International Refereed Journal of Engineering and Science (IRJES)
ISSN (Online) 2319-183X, (Print) 2319-1821
Volume 5, Issue 6 (June 2016), PP.05-10

Ferry Transport Demand And Weather Conditions Related To The Shipping Traffic Safety Pamatata-Bira, South Sulawesi

Abdul Rahman,[1] M. Yamin Jinca,[2] Andi Haris Muhammad [3]
[1]*postgraduate Student, Transportation Engineering Program, Hasanuddin University, Makassar-Indonesia*
[2]*professor, Transportation Engineering, Hasanuddin University, Makassar-Indonesia*
[3]*st, Mt, Ph.D, In Naval Engineering, Hasanuddin University, Makassar-Indonesia*

Abstract: The sea transportation safety and ferry transport are a priority of the government program known as Zero Accident which is to reduce the number of accidents at sea are generally caused by human error, technical error and weather. The aim of this research, uncovering the loading system and the safety of ships crossing at the Pamatata Bira cross related to the weather conditions and ship operations, analyze and describe the loading conditions and time management of ship operations from the aspect of water environment crosswalk Pamatata-Bira. The results showed that, the growth of cross currents crossing Pamatata-Bira in 2015 has increased significantly, the growth of passenger vehicle and the highest occurred in July. This case is caused by Eid season so that the flow of vehicles to ferry Pamatata surge of passengers and vehicles. The environmental conditions of water at Pamatata-Bira such as waves, winds and currents at times subjected to extreme conditions for shipping, especially in January, July and August, so that the necessary preferential policies for permission to sail.

Keywords: Safety, Environment Water, Ship Condition, Human Resource

I. INTRODUCTION

In the last decade, developed countries have managed to reduce the number of accidents of sea transport. But in the Unity State Republic of Indonesia is not optimal reduce the number of sea transportation accidents. It is characterized by still many transportation accidents in the waters of Indonesia. The number of accidents that occurred in Indonesia ship based on data from the Indonesian Shipping quite concerning, and in general the cause of the accident the ship is humman error factor 78.45%, 9.67% technical error, weather 1:07%, the weather and technical errors 10.75%, (Jinca, 2011: 150). Efforts to reduce sea transportation accidents that can result in the risk of death, serious injury to passengers and damage to, loss of goods and material losses to the public needs serious attention.

Sea accidents at this time, to the attention of all parties, not only the shipowner but also the government, relevant agencies and the public to be more active in providing information. The NTSC argues that the main causes of sea accidents in general is due to overloading of haulage defined, either in the form of vehicles and passengers. Even less so the shipping service users impose themselves on a ship, even though the ship was filled with a determination to be the place of origin on ship.

Ro-Ro ship accident *KM Dharma Mangala* which operates at crossings Pamatata-Bira in 2003 with 107 passenger load conditions, four buses, one car and five motorcycles canvas departed from the dock Bira towards Selayar at 19:00 pm. But 45 minutes after leaving the dock, suddenly hit by a big wave with strong winds, so that the ship ran aground about 100 meters from the pier, (Jendela Selayar, 2009). Referring to the phenomenon of the number of accidents at sea so that the need to review aspects of the request, loading and weather conditions associated with the safety of shipping in an effort to increase the safety of ferry transport.

Weather conditions at the crosswalk Pamatata-Bira in January and July to September and the current state of extreme waves. The conditions passenger flow in July to December is also experiencing a surge in passenger and freight vehicles so that the risk of an accident at sea. Based on the description above formulation and study questions as a starting point is the safety of the ship posits ferry transport is highly dependent on the loading aspect, the weather and the condition of the ship.

II. METHODS OF STUDY

The improvement the safety of ferry transport carried out on ferry ships which operates at the port of Pamatata-Bira using non-experimental approach and descriptive. The basic concept is to analyze and describe the loading and weather conditions associated with the crossings, as well as giving an overview of time management in improving the safety of ship operations ferry transport in terms of environmental aspects in waters crossing Pamatata-Bira. This research is a case study, the research object is Ferry KMP. Bontoharu belongs the ASDP which operates at the crosswalk Pamatata-Bira.

The steps in the research include the analysis of variation and wave characteristics is conducted qualitatively by the following stages:

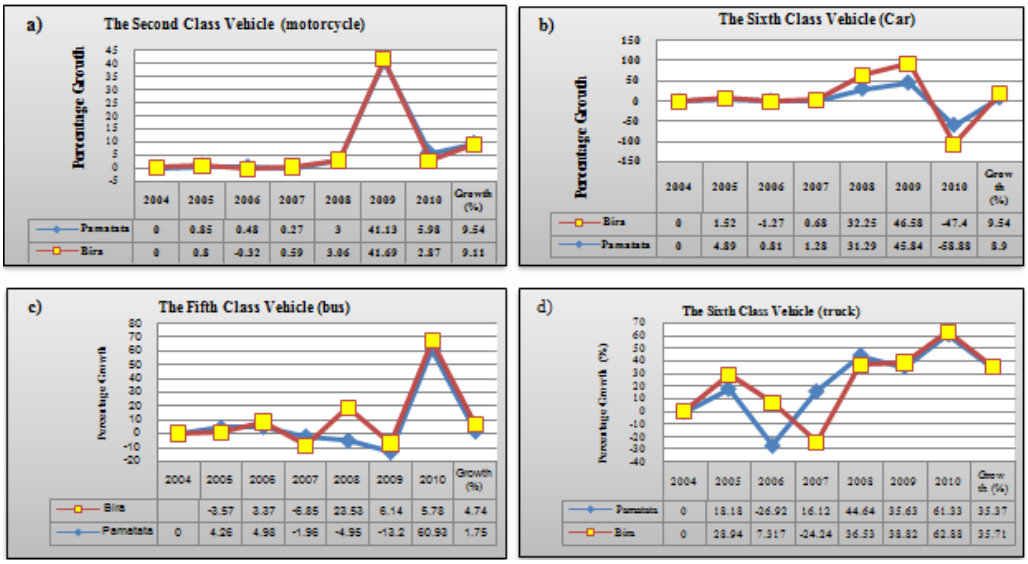
a. Analyzing the data state of the wave in the past year related to vessel operation time.
b. Analyzing the data speed of the wind in the past year related to vessel operation time.
c. Analyzing the data flow speed in the past year related to vessel operation time.
d. Associating with the environmental aspects of transport crossing safety improvement and determine the times of operation of the vessel safe for shipping.

After conducting an analysis related to environmental conditions (weather: waves, winds, currents) formulated diskriktif efforts to increase the safety of ferry transport.

III. RESULTS AND DISCUSSION

Ferry Transport Demand

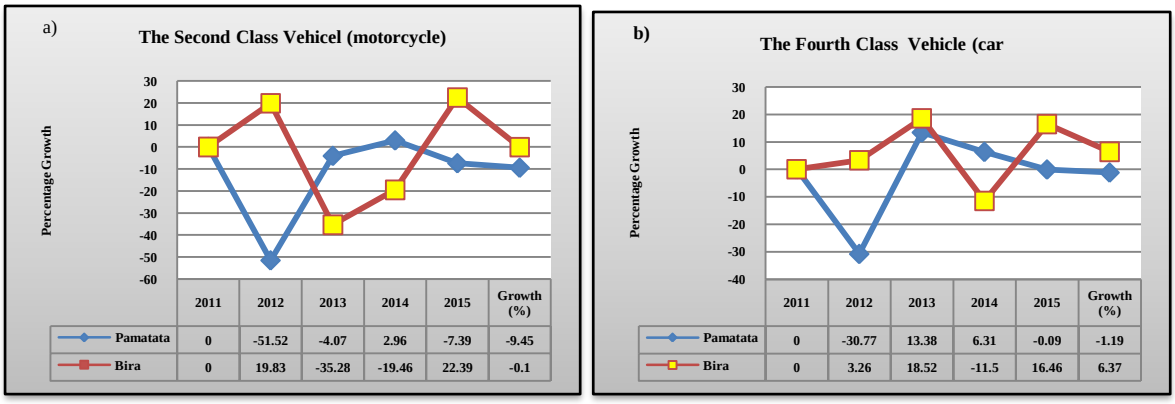
Based on the results if the growth data for the average vehicle in the period 2004 to 2010 according to (Nurwahida, 2013) which is the highest in the Port of Pamatata is the second class of vehicles (motorcycle) that is equal to 9.54% and the second highest is the sixth class of vehicles (trucks) that is equal to 35.37%. This shows that the current crossing for motor vehicles and trucks has increased due to economic growth in the flow of goods and services increased both areas. The rate of growth as in Figure 1.

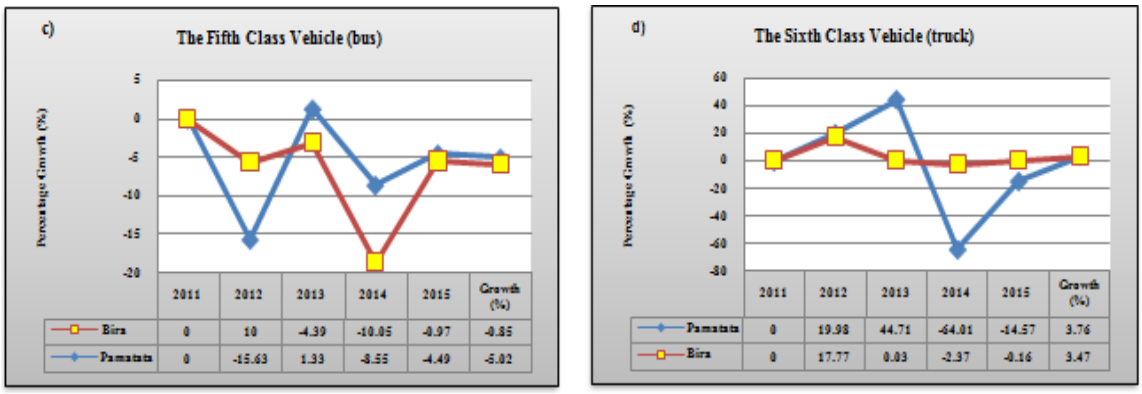


Source: The results of the research data processed in 2016

Figure 1. Growth Period 2004-2010 Vehicles; a). Second Class, b). Fourth Class, c). Fifth Class, d). Sixth Class.

Ferry transport from the port of Bira experiencing high growth in most vehicles in 2004 to 2010 is the sixth class vehicles (trucks) amounted to 35.71% and the fourth class vehicles (cars) amounted to 9.54% can be seen in chart 7 and 3. In 2011 to 2015 the average growth of the highest vehicle is the fourth class (car) amounting to 6.37% and the sixth class (truck) at 3.76%, as in Figure 1.



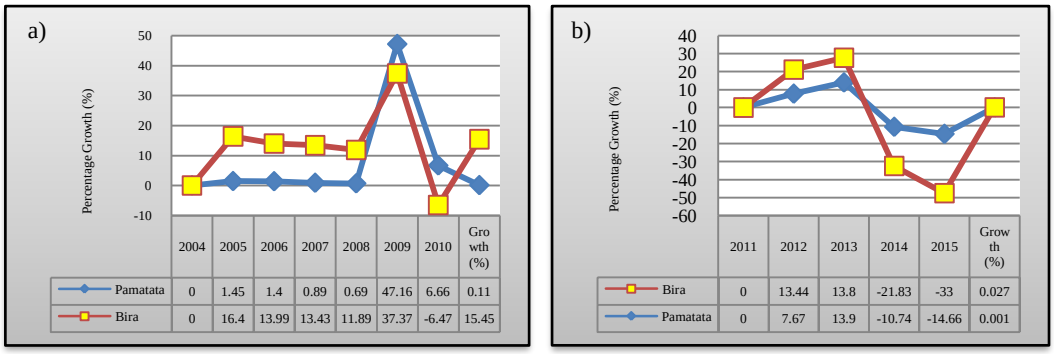


Source: The results of the research data processed in 2016

Figure 2. Growth Period 2011-2015 Vehicles; a). Second class, **b). Fourth class, c). Fifth class, d). Sixth class**

The data growth of vehicles in 2011 to 2015 as in Figure 2, the average growth in the crossing of Pamatata to Bira, second class vehiclfes (motorcycles), fourth class (cars), fifth class (buses) decreased significantly. It seems that the traffic flow is not so significant crossings according to the data from 2004 to 2010.

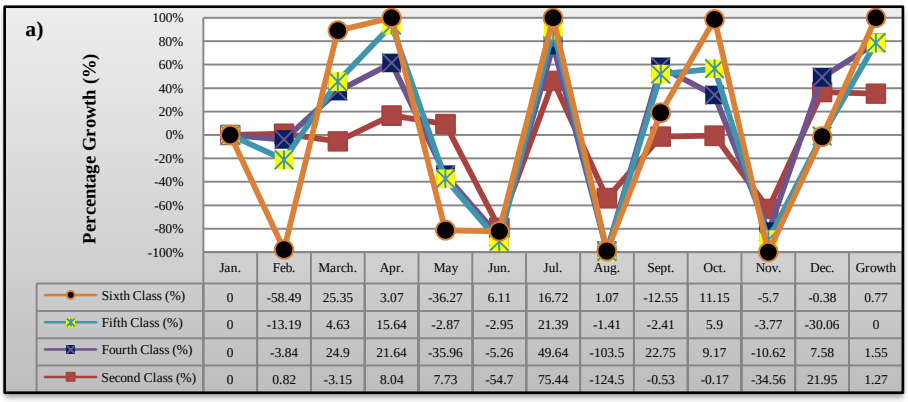
The growth of passenger increases on the crosswalk Pamatata-Bira from 2004 to 2010 according to (Nurwaida, 2013) the growth of passengers increasing on the port of Pamatata 0.11% and passenger from the port of Bira amounted to 15.45%. Passenger growth rose in 2011 to 2015 which rose from Pamatata by -0.001% and a rise at the Port of Bira -0.026% decrease compared to the previous year, can be seen in figure 3.

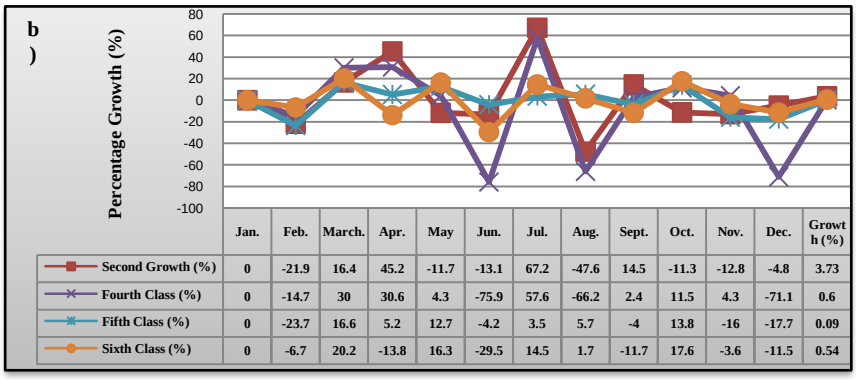


Source: The results of the research data processed in 2016

Figure 3. Passenger Growth; a). Period 2004 to 2010, b). Period 2011 to 2015

The flow of passengers and vehicles crossing freight traffic Pamatata-Bira in 2015, the highest growth in the vehicle at the crossing Pamatata is the fourth class vehicles (cars) that is equal to 1.55%, the second class (motorcycle) of 1.27%. For the fifth class vehicles (bus) and the sixth class vehicle (truck) is not so significant growth can be seen in. By contrast, the growth of vehicles from crossing Bira highest are the second class vehicles (motor) of 3.73% and for the sixth class vehicles (cars), the fifth class (bus) and the sixth class (truck) growth is not so significant, it can be seen in Figure 4.



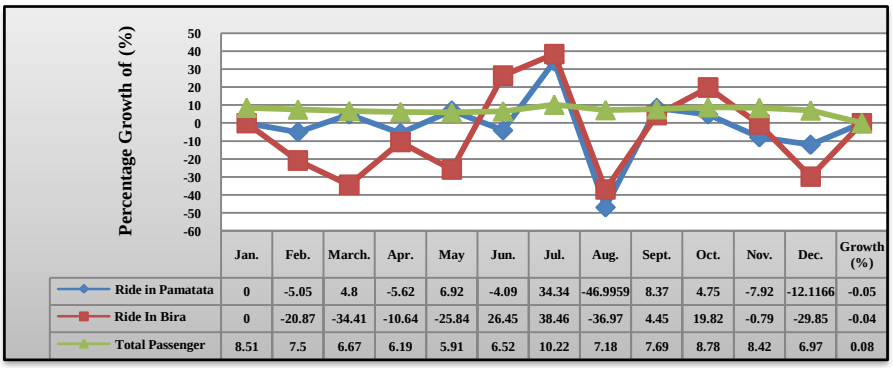


	Jan.	Feb.	March.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Growth (%)
Second Growth (%)	0	-21.9	16.4	45.2	-11.7	-13.1	67.2	-47.6	14.5	-11.3	-12.8	-4.8	3.73
Fourth Class (%)	0	-14.7	30	30.6	4.3	-75.9	57.6	-66.2	2.4	11.5	4.3	-71.1	0.6
Fifth Class (%)	0	-23.7	16.6	5.2	12.7	-4.2	3.5	5.7	-4	13.8	-16	-17.7	0.09
Sixth Class (%)	0	-6.7	20.2	-13.8	16.3	-29.5	14.5	1.7	-11.7	17.6	-3.6	-11.5	0.54

Source**:** The results of the research data processed in 2016

Figure 4. Growth of Vehicle; a). At the Port of Pamatata, b). At the Port of Bira

Passenger growth at the crosswalk Pamatata-Bira in 2015 for passengers who ride on the Port of Pamatata by -0.05% and passengers from the port of Bira of -0.04%, passenger growth was not significantly increased in each year, as seen in Figure 5.



	Jan.	Feb.	March.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Growth (%)
Ride in Pamatata	0	-5.05	4.8	-5.62	6.92	-4.09	34.34	-46.9959	8.37	4.75	-7.92	-12.1166	-0.05
Ride In Bira	0	-20.87	-34.41	-10.64	-25.84	26.45	38.46	-36.97	4.45	19.82	-0.79	-29.85	-0.04
Total Passenger	8.51	7.5	6.67	6.19	5.91	6.52	10.22	7.18	7.69	8.78	8.42	6.97	0.08

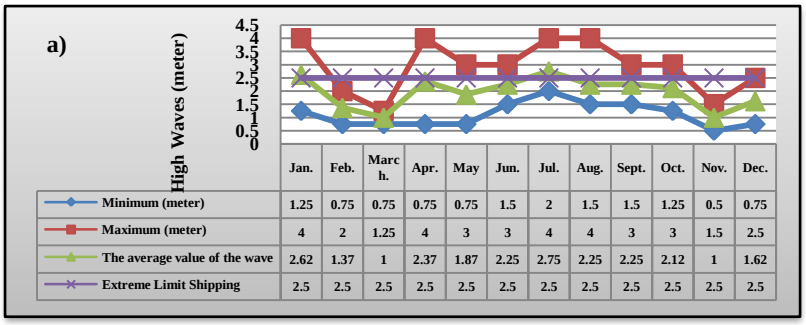
Source: The results of the research data processed in 2016

Figure 5. Fluctuations Passenger Growth in 2015

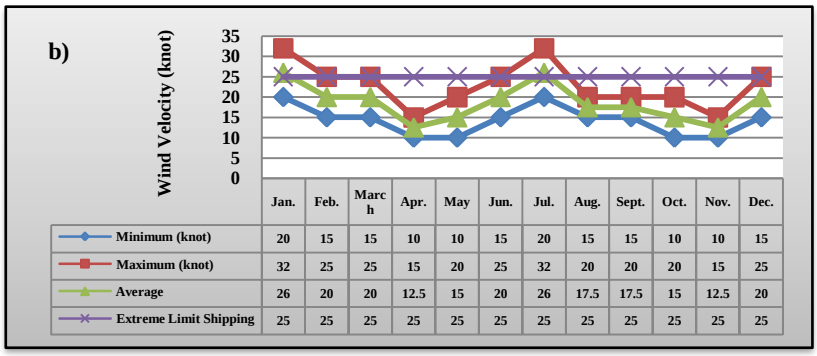
Seeing the growing demand for traffic crossing Pamatata-Bira in 2015 passenger vehicle growth and the highest occurred in July. The second class vehicles (motor) of 75.44% the second highest fourth class vehicles (cars) amounted to 49.64% the fifth class vehicle (bus) and the sixth class (truck) did not experience growth so significant. This is due in July is the season of Eid so that the flow of vehicles to ferry Pamatata surge of passengers and private vehicles.

Water Environment Condition

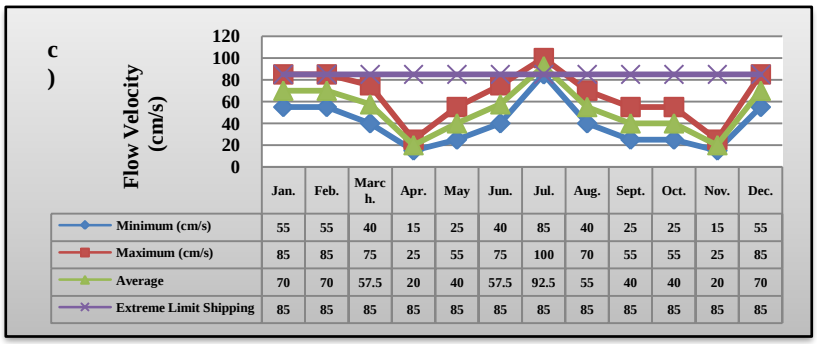
The characteristics of sea waves at Selayar-Bulukumba waters based on the data showed that the average wave height in January and July are relatively high compared to other months. The wave height is between 1.25 to 4 meters. Wind speed and direction over the surface of the waters Selayar-Bulukumba in January and July, more wind blowing from the east at a speed of between 20-32 knots. Wind speed like this affect the wave height and speed of currents in waters Selayar-Bulukumba especially in July reached an average of 85-100 cm/s as a result of east wind that blows from the Straits of Australia and there are no obstructions or flanking island near waters Selayar-Bulukumba so that the flow of sea water so fast. Water conditions at crossings Pamatata cross-Bira as in Figure 6.



	Jan.	Feb.	Marc h.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum (meter)	1.25	0.75	0.75	0.75	0.75	1.5	2	1.5	1.5	1.25	0.5	0.75
Maximum (meter)	4	2	1.25	4	3	3	4	4	3	3	1.5	2.5
The average value of the wave	2.62	1.37	1	2.37	1.87	2.25	2.75	2.25	2.25	2.12	1	1.62
Extreme Limit Shipping	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5



	Jan.	Feb.	Marc h	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum (knot)	20	15	15	10	10	15	20	15	15	10	10	15
Maximum (knot)	32	25	25	15	20	25	32	20	20	20	15	25
Average	26	20	20	12.5	15	20	26	17.5	17.5	15	12.5	20
Extreme Limit Shipping	25	25	25	25	25	25	25	25	25	25	25	25



	Jan.	Feb.	Marc h.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Minimum (cm/s)	55	55	40	15	25	40	85	40	25	25	15	55
Maximum (cm/s)	85	85	75	25	55	75	100	70	55	55	25	85
Average	70	70	57.5	20	40	57.5	92.5	55	40	40	20	70
Extreme Limit Shipping	85	85	85	85	85	85	85	85	85	85	85	85

Source: The results of the research data processed in 2016

Figure 6. Water Condition Cross Pamatata-Bira

Management oversight here is more focused on the supervision of the environmental aspects related to the weather conditions where frequent crossing delays due to bad weather. In this case, management supervision and always pay more attention to coordination of weather information from Meteorology Climatology and Geophysics Council (MCGC) that ships operating schedule to avoid times of operation in which the current extreme weather conditions. It is necessary adjustments to the schedule departure of the ship in order to avoid accumulation of vehicles.

IV. CONCLUSION

Passenger and vehicle loading conditions at the crosswalk Pamatata-Bira increased, seen in July, the number of ship operations increased by 50% from the previous, reaching 90 trip. The number of passengers reached 20.452 inhabitants and vehicles reached 6.172, this is caused by fluctuations in the percentage homecoming of Idul Fitri.

Environmental conditions (weather) in the waters Pamatata cross-Bira vary according to the months of the incident. Wave conditions, wind direction and speed and flow in January and July are very extreme for a cruise. Conditions waves reach 3-4 meters, in July, especially in the early months of around during the day at 12.00 until the evening at 23.59. To avoid accidents, shipping operations performed at the time declared safe natural conditions, namely at dawn until noon.

Suggestion

To reduce the rate of accidents at sea should consider loading the operating conditions on board. Operations manager and oversight improved, especially in a particular month to avoid high waves at the time of sailing.

REFERENCES

[1]. A Caret Lawalata, Herman. 1995. Ports and shipping. Jakarta: The First Print of Aksara Baru.
[2]. Anominous, 2008. Guidance on Application IMO, Codeficition International Safety Management (ISM Code). PIP Makassar
[3]. Research Institution and development Studies and Training Needs Jakarta Transportation Safety Auditor. 2009.
[4]. Danny, Faturachman et al, 2015. Analysis of Sea Transportation Safety Crosswalk Accidents and Anticipation Against Ships In Merak-Bakauheni. Jakarta: University of Sultan Ageng Tirtayasa
[5]. Department of Transportation 1985. Glossary of Terms Transportation. Jakarta
[6]. 2014. Review The Strategic Plan of The Directorate General of Sea Transportation in 2010 to 2014. Jakarta.
[7]. http://penyeberangantarakan.blogspot.co.id/2012/02/keselamatan-transportasi-laut.html . (2015)
[8]. https://id.wikipedia.org/w/index.php?title=Keselamatan_pelayaran&action=edit&section=2 (2015)
[9]. Mudana, I Ketut. 2014. Increased Control Transport Safety Crossing. Journal of Transportation & Logistics Management (JMTransLog) - Vol. 01 ISSN 2355-4721
[10]. Nathanael, Ivan. 2011. Analysis of Safety Crew Based Concept The Maritime Labour Convention (MLC) 2006 at The Crossing Route of Ketapang – Gilimanuk.
[11]. Jinca, M Yamin. and Lindasari 2007, Basics of Transport, Education and Training Center for Administrative Department of Transportation.
[12]. Jinca, M Yamin. 2011. The Indonesian Sea Transportation System Analysis and Case Studies, Surabaya: Brilliant International.
[13]. Malisan, Johnny. 2013. Safety Folk Shipping Sea transportation: A Case Study phinisi Fleet. Makassar: Hasanuddin University.
[14]. Nurwahidah, 2013, Freight Demand Model Crosswalk Bira-Pamatata In South Sulawesi, Makassar: Transportation Engineering University of Hasanuddin.
[15]. PM 45 Year 2012 on Ship Safety Management
[16]. Indonesian Government Regulation No. 20 of 2010 Concerning Waterway Transport
[17]. Erlina, Ria Septi. 2010. Risk Management Safety and Health at Work On Passenger Ship Crossing. Jember.
[18]. Arianto, Setio Boedi et al. 2012. Research Performance Optimization pioneer Ferryboat transport In Sulawesidalam to Support The Masterplan for Acceleration and Expansion of Indonesia's Economi Development (MP3EI). Institution of Research and Development of the Ministry of Transportation.
[19]. Parlindungan, Siahaan et al. 1999, Competencies and Skills of Seafarers, An Overview of The International of the STCW-95. Jakarta: Training expert Sailing Science Foundation High School Lecturer Sailing.
[20]. SOLAS - International Convention for the Safety of Life at Sea.
[21]. PT. Trans Asia Consultants. 2009. The Study of Sea Transport Accident Trend Analysis. Jakarta
[22]. Nikson, Willem. 2009. Safety Policy and Sea Transportation Security. Jakarta: Security Coordinating Institution.