
COAL LOADING STRATEGY IN NON-CRANE BULK CARRIER AS AN EFFORT TO REDUCE BROKEN SPACE IN THE HOLD OF MV AMANAH MOROWALI AMC

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Abstract

Broken space is another name for lost space caused by cargo that is not compacted into the hold. Damaged loading and unloading equipment that cannot level the cargo in the hold is one of the factors of broken space, limited spare parts and the unavailability of spare dozers are obstacles in loading. The purpose of this study is to determine the condition of the hold when there is broken space, the factors that cause broken space, and the loading strategy carried out in order to prevent broken space. The type of research method used by researchers in compiling this thesis uses qualitative research methods with fishbone techniques to facilitate researchers in analyzing data. The method of data collection that researchers do is by means of observation, interviews, and documentation to strengthen in analyzing data. The result of this research discussion is that the final result does not match the loading plan that has been set before, it can be concluded that what affects the broken space of coal cargo so that it causes space or space that cannot be loaded. The factor that causes the broken space of coal cargo on MV Amanah Morowali AMC is that the dozer used as a tool for trimming cargo is damaged, so that no load leveling is carried out. Efforts made to prevent broken space in the hold are by familiarizing the cargo holds, following the loading procedures in the pre-stowage plan and loading squence, and trimming the cargo from the start of loading.

Keywords: Broken space, Cargo hold, Coal, Dozer, Loading.

INTRODUCTION

Broken Space is another name for lost space caused by cargo not being compacted into the hold (Rusmadika Sidqi, 2022). An unusable loading space will greatly affect the amount of cargo that can be carried by the ship. Making the load hold usable and able to be loaded in accordance with the pre-stowage plan is one of the duties of the watch officer when carrying out loading. On ships carrying coal, such as researchers when doing sea practice that broken space in the hold needs to be taken seriously, because it has a significant effect on the cargo that can be loaded, even up to thousands of tons of difference that occurs when there is a broken space on the ship. This is certainly detrimental to the buyer because the coal loaded does not match the amount of planning that has been determined.

MV Amanah Morowali AMC is a ship owned by PT Samudera Indonesia, which is a bulk coal carrier sailing in Indonesian waters. This ship has 50,478 GT and has a DWT of 93,795 MT. This ship can load up to 92,000 MT of coal with 5 (five) jumbo holds, which is equivalent to a ship with 9 (nine) holds. During the researchers' sea practice, it often happened that the cargo could not be maximally loaded which required unloading the cargo to overcome the broken space on the ship, so that the cargo could be loaded according to the pre-stowage plan that had been set. This resulted in the loading process being hampered and taking a long time.

Loading is preparing and transporting goods on tackle on the dock then transporting them to the top of the hatch then releasing and compacting the cargo in the hold (Susantoro, 2019). Through

this understanding, if implemented on a coal carrier, loading is the activity of transferring cargo (coal) from a barge through a floating crane ship using a grab and then releasing it into the hold and compacting it in order to maximize loading space. Loading activities will be able to run optimally if all people who participate in cargo handling activities can work well together so that loading can run according to the estimated time. Evenly distributing the cargo in every corner of the loading space is one indicator of the success of loading. Each ship has different loading space characteristics that must be considered by everyone who is carrying out load handling.

The MV Amanah Morowali AMC ship does not have a deck crane so that coal loading is assisted by a floating crane ship by ship to ship or commonly called transshipment. Coal is one of the most important energy sources to fuel power generation and serves as a staple fuel for steel and cement production (Muhammad Fahrul Razi, 2021). As one of the sources of raw materials from power plants, coal is in demand by domestic and foreign commodities because not every country has the availability of this natural product. According to Hapzi Ali *et al.*, (2022), Indonesia is one of the largest coal producing countries in the world. To drive industrial machinery, every country still uses coal as fuel. Due to the existence of coal which is quite important, countries that still use coal try to fulfill their domestic energy supply, so that industrial and economic activities run well (Mahaputra & Saputra, 2022).

LITERATURE REVIEW

1. Strategy

According to Tries Edy Wahyono (2022), strategy is a way to solve and improve a problem. Strategy is used as a road map for an organization to achieve its main objectives, these objectives include increasing company value, developing managerial capabilities, implementing corporate social responsibility, and improving administrative systems.

2. Loading

According to Suparman *et al.*, (2022), loading is goods in the form of break bulk (goods that are not put into containers) that will be shipped or goods that are put into containers that will be shipped.

3. Coal

Coal is one of the materials used to power power plants, although currently some developed countries have reduced the use of coal, because it is considered a dirty energy fuel. The life cycle of coal from its origin underground to its utilization process creates toxic waste.

4. Bulk Carrier

Bulk cargo carriers are ships built specifically to carry bulk cargo that is shipped in large quantities though (Readi Adana Matanari *et al.*, (2023).

5. Loading and Unloading Equipment

According to Nanda Aira Nur Anisa *et al.*, (2024), the definition of loading and unloading equipment is the tools used in the process of moving containers or cargo at the port as a means of supporting loading and unloading activities.

6. Broken Space

Broken space, also known as lost space due to cargo not being compacted into the hold, dozer loading support equipment that cannot maximize its function as a compactor is the main factor causing loading space to become unusable (Rusmadika Sidqi Almasyifa, 2022).

7. Transshipment

According to Mika Patayang *et al.*, (2016), transshipment is an activity of transferring goods or cargo carried out in the middle of the sea from ship to ship, because the conditions of the area are safe from natural disturbances such as storms or strong winds (special areas in the middle of the sea for transshipment activities).

8. Stowage Plan

According to Alfi Choirul and Vega F (2020), a stowage plan is a planning chart for loading goods on board a ship that is made before the ship carries out the loading and unloading process. This planning chart contains the name of the loading or unloading port, the amount of cargo to be loaded and the position of the cargo to be loaded.

9. Cargo Hold

According to Endang Lestari *et al.*, (2021), the loading space or hatch is the room under the deck where the ship's cargo is stored. Each ship has a loading bay that is used to store or carry cargo from one place to another.

RESEARCH METHOD

This research uses qualitative methods to understand the condition of the loading space and the factors that cause broken space in loading coal on ships without cranes. Creswel in Murdiyanto (2020) defines qualitative research as a process of investigating social phenomena. According to Sugiyono (2019: 104) Data sources consist of primary and secondary data. Primary data, collected through interviews with various roles on the ship such as Chief Officer, Second Officer, Third Officer, and Foreman, as well as direct observation during coal loading. Secondary data includes documents such as ship particular, bill of lading, cargo manifest, and others. Data collection techniques, such as observation, interviews, documentation studies, and literature studies, help in obtaining accurate data. According to A. Pratama *et al.* (2023) Observation involves direct observation at the research site, while interviews are conducted to gain in-depth understanding from the interviewees. According to S. Idawati *et al.* (2024) the documentation method includes analyzing documents and images related to the loading. According to Andi Cahyo Purnomo (2022) literature study is used to compare the practice in the field and theoretical data related to coal loading on bulk carriers that do not have cranes.

According to Ovan & Andika Saputra (2020), qualitative research instruments consist of observation, interviews, and documentation, where researchers play an active role in collecting and analyzing data. The use of appropriate instruments, such as grids for observation and interview guidelines, is important to obtain relevant data.

Qualitative data analysis includes data reduction, data presentation, and drawing conclusions. Data reduction (Ahlan Syaeful Millah *et al.*, 2023) involves simplifying the raw data, while data presentation allows for better understanding through narratives and descriptions. Conclusions were drawn using fishbone diagrams to identify the causes of problems (Monoarfa *et al.*, 2021:16), which helped in understanding the impact and causes of broken spaces.

RESULTS AND DISCUSSION

It was found that coal loading on the MV Amanah Morowali AMC at Taboneo Anchorage experienced a number of problems during the 23rd voyage from January 20 to 31, 2023, through

observation, interviews, and documentation methods. Researchers identified several key issues affecting the loading process, as follows:

1. Delay in Loading Process: The loading process was delayed by 6 days, which should have taken 4 days. This was caused by the foreman's decision not to perform trimming in order to meet the loading target, which resulted in the actual loading reaching 88,000 MT of the planned 91,200 MT. As a result, there was broken space in the hold which resulted in uneven coal distribution.
2. Dozer Damage: The floating crane vessel only provided 1 dozer, which caused damage to the dozer machine due to continuous use. While trimming, the dozer suffered an explosion, resulting in a temporary stoppage of loading and extending the planned loading duration.
3. Hatch Space Characteristics: The hatch space of MV Amanah Morowali AMC has a unique design that makes it difficult to distribute cargo evenly. Although it can accommodate up to 93,795 MT, the characteristic narrow hatch space at the top causes constraints during the loading process.
4. Disregarded Loading Procedures: Foreman did not familiarize the hatch space before loading, and ignored instructions and warnings from the duty officer. This resulted in a violation of loading procedures and increased the risk of broken spaces.



Figure 1. Profile of Hatch No. 2 from the Main Deck
Source: Researcher Document (2023)



Figure 2. Broken Space in Hatch No 2
Source: Researcher Document (2023)

Stages of data collection through observation, interview, and documentation methods, the data that has been collected is divided into groups based on the problems formulated previously. This grouping aims to analyze the condition of the hold that is not in accordance with the pre-stowage plan, the factors that cause broken space, and how to prevent it when loading MV Amanah Morowali AMC. Based on the data collected, the condition of the hatches was not optimal after loading; from the main deck side, the cargo was dense throughout the hatch, resulting in the hatchcover not being able to be closed. Meanwhile, from the manhole side, there were unfilled areas, making the compaction process difficult. In conclusion, if loading is not in accordance with the pre-stowage plan, broken spaces will appear in the hold. In the root cause analysis, several factors were found to cause broken space, including humans who did not familiarize themselves with the loading space and ignored the duty officer's instructions, damage to the dozer that was not repaired immediately, and the absence of a backup dozer which hampered the loading process. In addition, not following the loading sequence and not maximizing load trimming also caused broken spaces. To prevent the occurrence of broken spaces, researchers suggest several strategies, such as conducting a toolbox meeting before loading so that all parties understand their respective duties, ensuring loading equipment is in good condition and has a spare, implementing the pre-stowage plan and loading sequence that has been set to maintain ship stability, and trimming cargo to the maximum.

CONCLUSION

Based on the discussion of coal loading strategies on non-crane bulk carriers, this research yields several conclusions regarding efforts to prevent broken space in the hold of MV Amanah Morowali AMC in Taboneo, South Kalimantan. First, the condition of the hold that is not in accordance with the pre-stowage plan shows that the cargo fills the entire space of the main deck, but the center and corner areas of the hold remain empty, which is known as broken space. Secondly, some of the factors causing broken space include the Foreman's failure to familiarize the loading space, ignoring the duty officer's instructions, damage to the dozer, the absence of a backup dozer, the non-use of the loading sequence, and the non-optimal trimming of the cargo. Third, to prevent the occurrence of broken space, the recommended loading strategy is to conduct a toolbox meeting before loading, ensure the readiness of loading equipment, implement a pre-stowage plan and loading sequence, and perform maximum load trimming.

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