Analysis of The Effectiveness Of The Implementation of Bridge Resource Management On Shipping Safety

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Abstract
As a busy shipping route, Indonesia experiences a high number of maritime accidents caused by human factors such as miscommunication and fatigue; therefore, the implementation of Bridge Resource Management (BRM) needs to be evaluated to ensure maritime safety. This study aims to analyze the effectiveness of BRM through responsibility, crew skills, and performance improvement efforts on the bridge of the MV ABM Nubiri. Using a descriptive qualitative approach, the population consisted of the entire bridge crew (17 people), with a purposive sample of three key informants (Captain, Chief Officer, and Helmsman). Research instruments included semi-structured interviews, participant observation, and documentation; analysis was conducted using the Miles-Huberman interactive method with triangulation. Results indicated clear task division, effective communication through repeated commands, and good situational awareness; however, these were hindered by fatigue and low participation from junior crew members. Conclusion: BRM is effective but requires routine training and fatigue management to optimize safety.

Keywords: *Bridge Resource Management, Fatigue Management, Maritime Safety, Situational Awareness and Teamwork.*

I. INTRODUCTION

As the world's largest archipelagic nation, Indonesia enjoys a strategic position as a major international shipping lane, with tankers, container ships, and bulk carriers frequently passing through its waters. Indonesia's busy waters make it one of the busiest shipping areas globally, with high ship traffic volumes supporting inter-island trade and transportation. This phenomenon brings economic benefits through low shipping costs and high capacity, but also increases vulnerability to maritime incidents.

Maritime transportation dominates national logistics due to its efficiency and scale, with companies choosing it for inter-island freight. However, this high level of shipping activity often carries a high risk, with human factors being a major contributor to accidents such as collisions and groundings. This situation emphasizes the need for optimal management of ship platform resources to maintain operational safety.

Despite the implementation of international regulations such as STCW and IMO, maritime accidents in Indonesia remain high, with human factors contributing to more than 70% of cases, including captain's negligence, such as the collision of the Trisila Bhakti II and Gerbang Samudra 2 vessels in the Bali Strait in 2022. The quality of human resources (HR) of the ship's crew is often the main cause, characterized by fatigue, miscommunication, and lack of situational awareness on the bridge. This phenomenon contradicts the government's target for safe, efficient, and effective maritime transportation.

The implementation of Bridge Resource Management (BRM), as an adaptation of aviation CRM, has not been optimal on Indonesian vessels, leading to deviations such as poor team coordination and poor utilization of navigational tools. Studies show that the lack of comprehensive training and supervision leads to poor decision-making, particularly in busy waters. As a result, incidents such as collisions and failed maneuvers continue to occur, resulting in loss of life, property, and the environment.

Gaps in BRM effectiveness are evident in the low engagement of junior crew, fatigue from long working hours, and a lack of real-world simulations, which exacerbate risks in vulnerable areas like the Sunda Strait. Root cause analysis confirms that inefficient platform resource management contributes to the loss of situational awareness and poor communication. This necessitates an in-depth study to identify contextual barriers and solutions.

This study aims to analyze the effectiveness of BRM implementation on maritime safety through an evaluation of crew responsibilities, skills, and performance improvement strategies on the bridge. The urgency lies in the high number of human-caused accidents in Indonesian waters, which require BRM intervention to support national safety targets and reduce economic and environmental losses. Its novelty is a contextual qualitative study on Indonesian tankers with a focus on field evaluations during sea practice, complementing previous, more general studies with practical recommendations based on primary data..

II. METHODS

This study uses a descriptive qualitative approach to deeply understand the perceptions, experiences, and challenges of ship crews in implementing Bridge Resource Management (BRM) for maritime safety. This approach allows for the exploration of factors that influence the effectiveness of BRM through narrative data from interviews, observations, and documentation, as Sugiyono explains that qualitative research is inductive and focuses on meaning rather than generalization. In addition, Sudaryono emphasizes that qualitative research procedures involve intensive participation of researchers in the field to build contextual understanding, while Emzir defines qualitative methodology as the exploration of natural phenomena through in-depth data analysis.

The main research instruments included semi-structured interview guidelines, participant observation sheets, and ship documents such as logbooks and safety meeting records to collect primary and secondary data. Data collection techniques included in-depth interviews with the Captain, Officer of the Watch, and Helmsman (Rahardjo, 2011), participant observation on the bridge (Spradley, 1980; 2018), and documentation studies (Yin, 2014; Dr. Abdul Fattah Nasution, 2023). Data analysis adopted the interactive model of Miles and Huberman consisting of data reduction, data presentation, and conclusion drawing/verification, with source triangulation for validity. Creswell added that qualitative analysis requires philosophical and ethical reflection in processing narrative data, supported by Sugiyono in combining data for hypothesis generation.

The research population was the entire crew on the bridge of MV. ABM Nubiri (a total of 17 people, including the Captain, Chief Officer, Second Officer, Third Officer, and Helmsman) during the Sea Practice (PRALA) July 2024-July 2025. The sample was selected purposively with the criteria of key informants directly involved in the implementation of BRM, namely Captain Muhammad Rijal, Chief officer Ripandi Purba, and Helmsman Mulyadi, for a complete representation of the role of the bridge (Moleong, 2014). This purposive sampling technique is in accordance with Sugiyono for exploratory qualitative research targeting informative subjects, as well as Sudaryono who recommends samples based on relevance to the study phenomenon.

The procedure begins with preparation (instrument development, ethical clearance), chronological data collection during the PRALA on the MV. ABM Nubiri through interviews, operational observations (berthing, anchoring, narrow-gauge sailing), and documentation. This is followed by transcription, data reduction, thematic presentation (informant answer tables, communication patterns), and verification of conclusions on the effectiveness of BRM. Emzir emphasized that qualitative procedures must be systematic from exploration to theory construction, while Creswell suggested a logical sequence: literature review, fieldwork, iterative analysis, and ethical reporting, with adjustments to the PRALA schedule (Dr. Abdul Fattah Nasution, 2023).

III. RESULTS AND DISCUSSION

Overview of Research Results

The general description of the research location is that the researcher carried out marine practice activities on the MV. ABM Nubiri ship for 12 months starting from July 2024 to July 2025. The researcher carried out marine practice activities at a company owned by PT. Sinarmas LDA Maritime where in this study the researcher will explain several problems that occurred when the researcher carried out marine practice activities.

Pic. 1MV. ABM Nubiri

Data Presentation

1. Interview Results

In this study, the authors present the results of interviews with key informants, including Captain Muhammad Rijal, Chief Officer Ripandi Purba, and Helmsman Mulyadi. The interviews were conducted during sailing practice on the MV ABM Nubiri, focusing on the crew's responsibilities and skills in implementing Bridge Resource Management (BRM) and efforts to improve crew performance on the bridge.

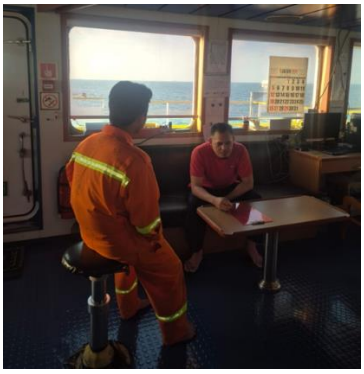


Fig. 2 Author's interview with Captain

Table**1Informant's answer to question 1.**

Question 1	Answer		
	Captain	Officer on Duty	Helmsman
How are tasks and responsibilities divided on the platform in implementing BRM?	Hmm… on the bridge, we're actually divided according to our respective duties. I tend to make the final decisions, especially during maneuvers. The officer on watch, as usual, monitors the ship's position, radar, and the surrounding area. The helmsman holds the wheel, but he doesn't just turn the wheel; he also has to look ahead and assess the situation.	Yes, as long as you're on guard, monitoring the ship, keeping radar and AIS on standby, and also monitoring the ship's position. And, for example, if there's a ship, its CPA is usually small.	Just following orders from the captain or officer. But I kept looking ahead, sometimes there were ship lights or something that was a bit strange, so I reported it to the captain. Usually like a fishing buoy.

The responses from the three informants indicate that each bridge crew member understands their role differently, depending on their position on the watch. The captain positions himself as the decision-maker, while the officer on the watch actively assists in monitoring navigation and reporting conditions around the ship. The helmsman views his role as not only steering the ship but also assisting with visual observations. This description demonstrates the division of labor on the bridge and the involvement of each member in maintaining safe navigation through their respective roles.

Table 2 Informant's Answers to Question 2

Question 2	Answer		
	Captain	Officer on Duty	Helmsman
What skills do bridge crews	In my opinion, communication and awareness of the situation are	The important thing is to understand navigational	For me, the most important thing is to

best possess to support BRM implementation?	paramount. Even if the person on duty is insensitive to the navigational equipment, it's still dangerous. Therefore, the person on duty must be aware of their surroundings, not just waiting to be told.	equipment, like radar, AIS, EchoSounder, and lookout. And also teamwork, because manning the bridge is impossible alone.	hear clear instructions. If I'm in doubt, I usually ask again, because even a small steering error can be dangerous.

The informants' responses indicated different skill emphases for each position. The captain emphasized the importance of communication and situational awareness, the officer on the watch emphasized mastery of navigational equipment and cooperation, and the helmsman emphasized clarity in receiving commands. These differences in emphasis indicate that the skill requirements on the bridge are not uniform, but rather vary depending on each individual's job responsibilities. All responses pointed to the need for coordination and attention to conditions surrounding the ship.

Table 3 Informant's Answers to Question 3

Question 3	Answer		
	Captain	Officer on Duty	Helmsman
How is communication and teamwork on the bridge during sailing and maneuvers?	Usually, every time I give a command, it has to be repeated. So, for example, if I give a steering command, the helmsman repeats it to make sure he heard it correctly. Especially during maneuvers, you can't mishear.	If a ship approaches or the situation changes, I immediately speak to the captain. Sometimes we chat briefly on the bridge, whether to change course or reduce speed.	I repeated every command the Captain gave me, letting them know I was listening. I was afraid there would be a miscommunication.

The accounts of the three informants revealed a two-way communication pattern on the bridge. The captain issued orders and requested repetition, the officer in charge of the watch reported navigational conditions and discussed them before taking action, and the helmsman repeated orders to ensure compliance. This suggests that information exchange occurred directly and repeatedly during the watch, particularly during maneuvers or during heavy traffic.

Table 4 Informant's Answers to Question 4.

Question 4	Answer		
	Captain	Officer on Duty	Helmsman
What are the main obstacles that often hinder the implementation of BRM on platforms?	What's often the most exhausting thing is work. Sometimes, after docking at night, the ship is already underway in the morning, so everyone has to be on standby, whether they like it or not. This reduces focus, and communication is sometimes lacking.	Well, this is it, dear, if you don't get enough rest, you must feel tired too, right? After working at night and then being on duty again in the morning, your concentration is a bit low and sometimes the information you convey is incomplete. Is that right?	Besides being tired and not getting enough rest, I personally find myself more focused on the communication from the captain or pilot when I'm at the helm. Sometimes I can't hear the commands, and in bad weather, visibility is limited, making it a bit difficult to see around. That's my opinion.

Based on the responses, the challenges that arose tended to be related to working conditions during the voyage. The captain and the officer in charge of the watch both mentioned fatigue after night operations, which affected their focus on the watch. The helmsman highlighted environmental factors such as wind and weather, which affected command reception and visibility. This suggests that the challenges arise not only from humans, but also from the ship's operational conditions and the sailing environment.

Table2Informant's Answer to Question 5

Question 5	Answer		
	Captain	Officer on Duty	Helmsman
What efforts are needed to improve crew performance in implementing BRM?	Before a shift, there should be a briefing. After a shift, or any other activity, there should be a brief evaluation to identify any shortcomings.	Hmm... BRM training should be done more often, not just during an audit or during an audit. Also, when a replacement officer is on duty, he should arrive earlier to check the ship's condition.	In my opinion, frequent communication is needed so that when the ship maneuvers, you are used to it and not confused.

The informants' responses highlighted the need for activities before, during, and after a watch. The captain mentioned briefings and evaluations after operational activities. The watch officer mentioned BRM simulation exercises and briefings before the change of watch, while the helmsman emphasized communication skills. This description demonstrates that performance improvement is understood as a continuous process encompassing preparation, implementation, and familiarization with work on the bridge.

2. Observation Results

a. Incident 1

The MV. ABM Nubiri berthing activity on Friday, November 29, 2024 at 03.00 LT was carried out in accordance with the provisions of STCW Code Section A-II/1 and SOLAS Chapter V, which require navigational supervision, effective communication, and teamwork on the bridge to ensure safe maneuvers and prevent collisions. During the berthing process at Suaran Jetty, the bow team prepared a pilot ladder for the pilot to board the ship, the author escorted the pilot to the bridge, then joined the bow to assist the third officer and boatswain in the preparation and implementation of the berthing as part of the application of the principles of navigational supervision and teamwork.

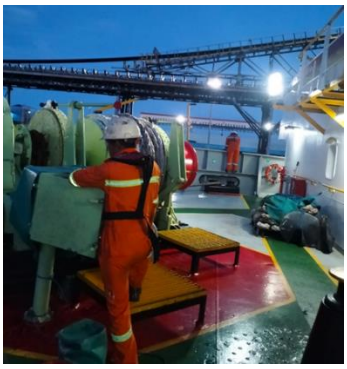
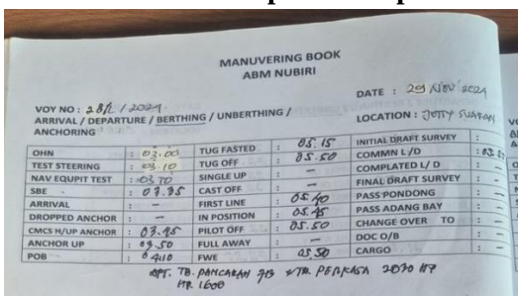


Fig. 3 Bow Team when the ship is in the process of docking



MANUVERING BOOK
ABM NUBIRI

DATE : 29 NOV 2024

VOY NO : 38A / 2024
ARRIVAL / DEPARTURE / BERTHING / UNBERTHING / ANCHORING

LOCATION : JETTY SUARAN

OHN	: 02.00	TUG FASTED	: 05.15	INITIAL DRAFT SURVEY	:
TEST STEERING	: 04.10	TUG OFF	: 05.50	COMMN L/D	: 03.15
NAV EQUPIT TEST	: 03.20	SINGLE UP	: –	COMPLATED L/ D	: –
SBE	: 07.35	CAST OFF	: –	FINAL DRAFT SURVEY	: –
ARRIVAL	: –	FIRST LINE	: 05.40	PASS PONDONG	: –
DROPPED ANCHOR	: –	IN POSITION	: 05.45	PASS ADANG BAY	: –
CMCS H/UP ANCHOR	: 03.45	PILOT OFF	: 05.50	CHANGE OVER TO	: –
ANCHOR UP	: 04.50	FULL AWAY	: –	DOC O/B	: –
POB	: 04.10	FWE	: 05.30	CARGO	: –

RPT. TB. PANCARAN 303 W/TB. PERKASA 2030 HP
HP. 1600

Fig. 4 Maneuvering book berthing at Suaran Jetty.

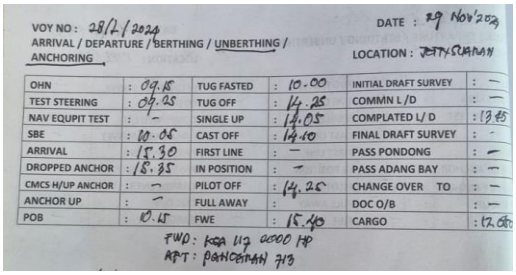
The stern team is taken over by the second officer and helmsman. After receiving information from the bridge, the bow and stern teams stand by to await the captain's direction for the berthing process. After the pilot takes over to direct the berthing process, the captain monitors the radar to prevent collisions with other vessels. The chief observes the ship's surroundings and the map. The helmsman stands by steering, telegraphing, and following the instructions of the captain and pilot.

b. Incident 2

The anchor drop activity of MV. ABM Nubiri on Monday, November 29, 2024 at 15.35 LT at Suaran Anchorage was carried out in accordance with STCW Code Section A-II/1 and IMO Resolution A.893(21), which emphasizes the responsibility of the officer on watch in monitoring the ship's position, coordinating the bridge team, and voyage planning for safe anchoring. Despite the hot weather with strong winds and other vessels around, the Captain led on the bridge assisted by the Chief Officer, Second Officer, and helmsman to monitor the conditions; while at the bow, the Third Officer, boatswain, and cadet prepared the power winch, opened the anchor chain lashing, and communicated via handy talky and hand signals waiting for the signal.

Fig. 5 Ship dropping anchor process

After the command is given, the anchor chain is lowered in stages. Each shackle released is immediately reported to the bridge by the third officer. Throughout the process, the bridge continuously monitors the ship's speed to ensure it doesn't move forward or backward. Once the anchor is securely held, the ship is stabilized, and the entire crew remains on standby until the situation is declared safe.



VOY NO : 28/2/2024 DATE : 29 Nov'24
ARRIVAL / DEPARTURE / BERTHING / UNBERTHING / ANCHORING LOCATION : SUARAN

OHN	: 09.15	TUG FASTED	: 10.00	INITIAL DRAFT SURVEY	: —
TEST STEERING	: 09.25	TUG OFF	: 14.25	COMMN L /D	: —
NAV EQUPIT TEST	: —	SINGLE UP	: 14.05	COMPLATED L/ D	: 13.45
SBE	: 10.05	CAST OFF	: 14.40	FINAL DRAFT SURVEY	: —
ARRIVAL	: 15.30	FIRST LINE	: —	PASS PONDONG	: —
DROPPED ANCHOR	: 15.35	IN POSITION	: —	PASS ADANG BAY	: —
CMCS H/UP ANCHOR	: —	PILOT OFF	: 14.25	CHANGE OVER TO	: —
ANCHOR UP	: —	FULL AWAY	:	DOC O/B	: —
POB	: 10.45	FWE	: 15.40	CARGO	: 12.000

FWD: KGA 112 6000 HP
APT: PANCOMAN 713

Figure 6 Anchoring book maneuver

c. Genesis 3

The sailing and avoidance activities of other vessels on the MV. ABM Nubiri, Sunday, June 8, 2025 at 17.00 LT in the Makassar Sea, were carried out in accordance with the STCW Code Section A-II/1 and SOLAS Chapter V which require situational awareness, traffic monitoring, and the use of navigation equipment to prevent collisions. In clear weather with good visibility even though there are other vessels around, the Chief officer as the watch officer assisted by the writer (cadet) on the bridge: monitoring the radar, recording the ship's position every hour in the log book, observing targets visually, reporting approaching vessels, and checking the distance and direction to maintain a safe path.

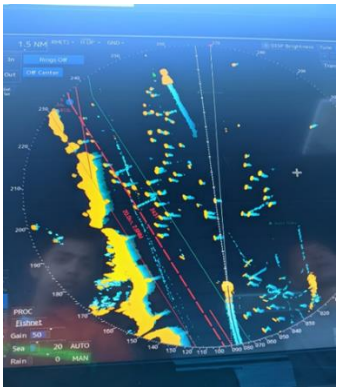


Fig. 7 Radar display as the vessel avoids fishermen

If a potential risk is detected, the chief officer immediately orders a course correction to maintain distance from other vessels. At that time, the ship was avoiding a fishing boat, which would have required a change of course. The chief officer ordered the cadet to take the helm.

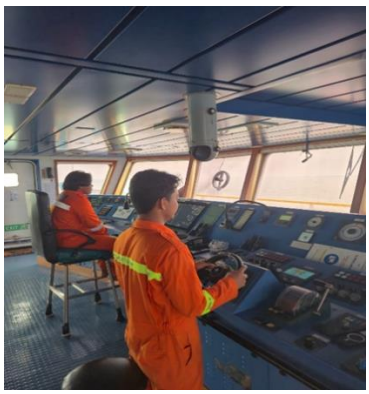


Fig. 8 Cadet holding the helm

d. Genesis 4

The voyage in the narrow channel of MV. ABM Nubiri on Sunday, July 6, 2025 at 04.55 LT when entering Muara Pondong through a narrow channel was carried out in accordance with STCW Code Section A-II/1 and SOLAS Chapter V IMO, which requires the officer on watch to understand the sailing conditions, safe speed, and intensive surveillance in high-risk areas for optimal coordination and vigilance. With the presence of small vessels and barges entering and leaving around the estuary, the maneuvering process requires strict supervision to anticipate potential dangers and maintain navigational safety.

Fig. 9 Condition of the bridge when the ship enters narrow passage

On the bridge, the captain, chief officer, third officer, and helmsman are on full alert. The captain controls the ship's course directly, while the chief officer monitors the radar position. The third officer watches for approaching vessels from the front and sides.

The ship's speed is reduced to allow for more controlled maneuvers. The helmsman follows the given steering commands. Communications are brief and repeated to ensure any changes in position can be immediately corrected.

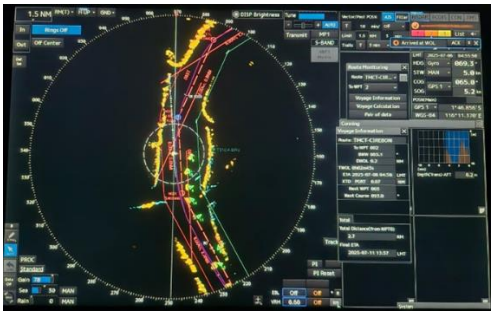


Fig. 10 Narrow gauge navigation radar display

3. Documentation

Table 6 Presentation of safety meeting documentation data on the MV. ABM Nubiri

No	Documentation	Activity	Time and Location
1.		*All Crew Safety Meeting:* Safety and guard procedures before the ship sails.	It is carried out when the ship is about to sail on the bridge.
2.		*Safety Video-Dvd Meeting All Crew*: Safety Directions and Guard Duties.	Every Saturday at 13.00 Ship Time in the Messroom.
3.		Implementation of Safety Meetings: Delivery of Safety Directions and Distribution of Tasks.	In June 2025 on the deck of the Mv. Abm Nubiri (Crew Assembly Point)

Data analysis

1. Division of tasks on the platform

This theme emerged from various statements from informants explaining the roles of each crew member in carrying out their duties on the bridge. The captain was positioned as the decision-maker, the officer on watch was responsible for navigational oversight, and the helmsman carried out steering commands. This pattern of role division was also clearly evident in observations of various operational activities, such as during berthing, anchoring, and when the ship was navigating through narrow channels. The uniformity of this pattern indicates that the division of tasks has become part of the work routine on the bridge.

2. Bridge crew skills

The data obtained shows that the most frequently mentioned skills are the ability to communicate clearly, awareness of one's surroundings, and mastery of navigational equipment. The recurring occurrence of these aspects across various data sources indicates the smooth operation of the bridge. In addition to technical

skills, there is also an emphasis on discipline and a willingness to continue learning, especially among junior or lower-ranking crew members.

3. Communication patterns on the platform

This pattern is formed from habits evident in the data, such as repeated commands, confirmations between crew members, and regular condition reporting. This pattern appears not only in informant statements but is also reflected in observations during maneuvering, anchoring, and sailing activities. Communication tends to be brief, direct, and repeated to avoid errors. This indicates a communication pattern that has become part of the work routine on the bridge.

4. Obstacles in implementing BRM

Based on the available data, it appears that the most frequently encountered obstacles stem from human factors. Several informants mentioned fatigue due to long working hours, reluctance to express opinions, and differences in experience levels among crew members. These obstacles aren't always directly visible, but emerge through statements that indicate limitations in speaking up and consistency in work.

5. Efforts to improve crew performance

This theme emerged from various statements regarding the importance of pre-task briefings, post-task exercises and evaluations, and regular safety meetings. These efforts are seen as a means to improve coordination, enhance readiness, and foster a shared understanding among crew members.

Taken together, these five themes form a comprehensive picture of work practices on the MV. ABM Nubiri platform. These themes are not isolated but interrelated, forming a unified pattern that illustrates the state of Bridge Resource Management implementation in the field. These findings then serve as the basis for entering the discussion phase.

IV. DISCUSSION

Bridge Resource Management(BRM) is a safety management concept on the bridge that is obtained through professional education and training for seafarers. BRM is defined as a planned approach that aims to maximize the utilization of all resources available on the bridge, including crew, navigation equipment, and work procedures, to support safe and appropriate decision-making.

In BRM, maritime safety is viewed not only as a result of individual technical skills, but also as a result of the crew's ability to communicate effectively, work together as a team, and understand operational conditions comprehensively. Therefore, BRM emphasizes the importance of human factor management as a key component in preventing errors that could potentially lead to ship accidents.

Principles of Bridge Resource Management.

Based on the material contained in the Bridge Resource Management certificate, the implementation of BRM on the bridge is based on Reg. A-II/1 and STCW Code Section A-II/1:

1. Allocation, Assignment, and Prioritization of Resources

a. *Bridge Organization and Procedures*

A clear organizational structure on the bridge is crucial; a clear structure prevents role confusion and conflict of responsibilities. Furthermore, standard operating procedures are needed to govern navigational activities, such as watchkeeping, mooring, anchoring, and emergency procedures. These procedures serve as guidelines to ensure consistent and coordinated actions.

b. *Maintain at Safe Navigational Watch*

The obligation to maintain continuous navigational surveillance. Surveillance is conducted through a combination of visual observation, radar, and AIS. The primary goal of safe watchkeeping is to ensure the vessel remains safe and avoids collisions, grounding, or misdirection.

c. *Voyage Planning*

This planning includes selecting a safe route, identifying navigational hazards, weather conditions, traffic density, and water characteristics. Good planning helps crews anticipate risks, so decisions on the ground are proactive rather than reactive.

2. *Effective Communication.*

a. Effectiveness of Information Exchange with Pilot

Communication is crucial between the crew and the pilot, especially when entering harbors or confined waters. The pilot has local knowledge, while the crew understands the vessel's characteristics. Effective information exchange allows both parties to work as a team, rather than as separate entities. Miscommunication with the pilot is often a major cause of accidents in confined waters.

3. Assertiveness and Leadership

a. Leadership and Group Decision Making.

Decisions should be made collectively. Although the captain has ultimate authority, input from the officer in charge and other crew members is also crucial to reduce individual bias. Group decision-making improves decision quality by considering more perspectives.

4. Obtaining and Maintaining Situational Awareness.

a. Situational Awareness and Error Trapping

The importance of detecting errors early, small errors that go undetected can develop into major accidents.

b. Casualty Cause and Prevention

Causes of accidents, both technical and human, and preventive measures through procedures and training.

c. Challenges and Resources

Emphasize a culture of mutual feedback. Every team member has the right to challenge decisions if they are deemed risky, and leaders are required to respond openly.

5. *Consideration of Team Experience*

a. Management of Stress and Distractions

Stress and distractions can reduce the quality of decision-making. Therefore, crew members must be able to manage work pressure.

b. Fatigue and Circadian Rhythm

Fatigue and the biological clock significantly affect concentration. BRM emphasizes the importance of managing work and rest hours.

c. Multicultural Diversity

Cultural differences can influence communication and leadership styles. BRM encourages cross-cultural tolerance and understanding.

6. Familiarization with Bridge Simulator

Simulators are used as a training tool to introduce crews to various navigation situations without real risk.

7. Simulation

a. Simulation 1: Narrow Channel and Dense Traffic

Train ship control in narrow waters in accordance with applicable regulations.

b. Simulation 2: Emergency Response

Train crew response according to responsibilities and skills in emergency situations.

8. *Assessment and Evaluation*

Assessment and evaluation aims to measure the effectiveness of training and crew performance, and to be the basis for continuous improvement in efforts to improve crew performance.

Bridge Resource Management Standard Operating Procedure (SOP).

In general, the Bridge Resource Management SOP on the bridge includes the following stages:

1. Planning (Passage Planning)

Develop comprehensive port-to-port voyage plans. Ensure all up-to-date charts, publications, and route information are available and reviewed. Establish crisis points and contingency plans.

2. Briefing (Captain Briefing – Pilot Exchange)

The captain briefs the bridge crew on the itinerary before departure. He exchanges detailed information (pilot cards) with the pilot upon arrival/departure.

3. Implementation of Watchkeeping

Following the standard operating procedure (SOP) for handover, the replacement officer ensures understanding of the ship's position, course, traffic, and the captain's instructions. The officer maintains continuous visual and auditory observations and cross-checks the use of navigational equipment.

4. Crisis management.

Every crew member has the right and responsibility to reprimand or report if they see potential danger or procedural errors, regardless of position.

5. Evaluation.

Conducting a review after the cruise is completed to analyze team performance and identify procedural improvements.

The discussion was conducted to provide meaning to the results of the data analysis, so that it can be known to what extent the findings in the field are in line with or different from the applicable Bridge Resource Management concept.

1. Crew responsibilities and skills in implementing Bridge Resource Management.

This research shows that Bridge Resource Management (BRM) practices on the MV. ABM Nubiri are well-established, with a clear division of tasks on the bridge: the captain makes decisions, the officer on watch oversees navigation, and the helmsman carries out orders. Communication, teamwork, and situational awareness are also evident in daily operations through the repetition and confirmation of commands.

However, its implementation is not yet fully optimal. Communication is not always consistent during busy working conditions, junior crew participation is still limited, and decision-making tends to be centered on the captain. Furthermore, the use of navigational equipment as a cross-check tool has not been fully utilized, so strengthening the BRM is still needed to be more consistent with STCW and IMO principles.

2. Efforts to improve crew performance in implementing Bridge Resource Management for shipping safety.

Improving crew performance in the Bridge Resource Management concept is carried out through strengthening communication, continuous training, work evaluation, and workload management to face various sailing conditions. This is also supported by the provisions of STCW Code Section A-VII/2 and IMO Resolution A.893(21) and A.960(23) which emphasize watchkeeping, bridge team coordination, and BRM training.

On the MV. ABM Nubiri, performance improvement efforts have been implemented through pre-departure briefings, post-arrival evaluations, and regular safety meetings. However, implementation remains largely formal, with no measurable follow-up action, workload and fatigue management suboptimal, and evaluation documentation is not systematic, resulting in underutilization of results for subsequent improvements.

V. CONCLUSION

This study found that the implementation of Bridge Resource Management (BRM) on the MV. ABM Nubiri showed a clear division of tasks according to roles (Captain as decision maker, officer of the watch as navigation monitor, helmsman as executor), effective communication through repetition of commands and condition reporting, and situational awareness during operations such as berthing, anchoring, and narrow sailing, although fatigue and minimal participation of junior crew still hamper optimization. This finding is in line with STCW Code Section A-II/1 and SOLAS Chapter V, where team coordination improves shipping safety, but consistency of training and evaluation needs to be improved to reduce the risk of human factors that dominate maritime accidents in Indonesia.

The study's limitations lie in its limited sample size (three key informants from one vessel) and its descriptive qualitative focus over a 12-month PRALA period, making the results not yet generalizable to national fleets or vessels of different sizes. Suggestions for further research include a mixed-methods approach with a multi-vessel sample and statistical analysis of the effectiveness of BRM after simulator training, as well as a longitudinal study of the impact of the latest IMO regulations. Practically, the study's implications recommend that shipping companies such as PT. Sinarmas LDA Maritime mandate daily

briefings, anti-fatigue watch rotations, and regular BRM audits to minimize incidents and support national safety targets.

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