

## Navigational Trip: Safety, Security, and Protection as Compliance to International Standard

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**ABSTRACT:** This study was determined the evaluation of the safety, security, and protection of the navigational trip in terms of safety among marine engineering students as an entire group and when they were classified according to section such as Polaris 3-A, Polaris 3-B, and Polaris 3-C. Respondents of the study were the one hundred twenty (120) Polaris marine engineering students who are currently enrolled in the College of Maritime Education of JBLFMU-Molo for School Year 2017-2018 who were on board or have undertaken the navigational trip and have observed some of the safety and security services on board. The researchers employed quantitative-qualitative research design by Creswell (2013) to determine the navigational trip and observations of the safety and security services on board. Results revealed that the respondents had “excellent evaluation” about the safety, protection, and security of the navigational trip vessel. There were no significant differences in the evaluation of the respondents as to the different sections; no relationships were observed when the respondents’ evaluation results were compared according to sections. The observations and comments cited in this study signify that the navigational trip vessel exhibited safety and security, maintain clean and safe environment, and followed the strict implementation of safety as prescribed by the international standards. The respondents’ comments attested that the navigational ship has implemented the international standard of safety and procedure on board.

### 1 INTRODUCTION

Shipping industry grew because of trade and expansion. Voyages got even longer as ships sailed across continents. Ships continue to meet accidents and run ground that contribute largely to the loss of life and property at sea because of human element that always surfaces as a significant factor (Mockel, Brenker, & Strohschneider, 2013). Navigational equipment and tools are used to give signals that will affect the navigating-officer’s decision in traversing his ship. The development of the country’s Aid-to-Navigation (ATON) system is underdeveloped as compared to Japan, Singapore, and South Korea. In line with this, the Philippine government through the

Maritime Industry Administration (MARINA) envisions to have safe, secure, efficient, viable, competitive, dependable, integrated, environmentally sustainable, and people oriented Philippine sea-transportation (Badayos, 1999 in Philippine Maritime Industry, 2016). MARINA functions cover domestic shipping, and implementation of STCW. It also monitors the regular upgrading standards on safety of the ship, level of service, and environmental sustainability in keeping with international standards and practice.

In this study of Berg, Stongard & Lappalainen (2013), the researchers stressed that 80% of accidents are caused by human errors, communication fatigue,

and language skills of seafarers. The maritime sector can achieve a competitive advantage by focusing on safety aspects of crews especially on operational safety. Furthermore, this study mentioned that the modern shipping is highly international and technological industry with strong demands on economic efficiency and profitability. The maritime accidents, indeed, defined as catastrophic incidents when considered the number of people in the ships, environmental damages, and values of the ships and carried cargoes (Basar, et al., 2013). This study underscored that there is a need for the requirement of focusing on human activities for the safe operation of the vessels and the need to provide high standard of safety, security, and environmental protection aiming to obtain an eminent reduction of marine accidents and high priority of human factor issues in the working area of the ships. Human error includes unsafe/dangerous actions of the operators, the preparatory conditions of unsafe or dangerous actions, incompetent audit, and organizational effects. The reasons of human errors are physical and technological surrounding factors, physical and situation of operators, human resources management, personal underlying or preparation factors such as alcohol usage and organizational factors such as insufficient allocation and maintenance of resources, and incompetent audits. The watchkeeping officer may not only be the performer of any error during the voyage of the vessel, other factors can be considered such as life stress, physical and psychological fatigue, motivation, work load, and working hours as individuals.

Sooksripaisarnkit (2013) stated that the company shall establish procedures to ensure that the ship's personnel receive relevant information on the safety management system in the working language or languages understood by the personnel. The company shall identify equipment and technical systems, the sudden operational failure of which may result in hazardous situations. The safety management system shall provide for specific measures that include regular testing of stand-by arrangements and equipment Sooksripaisarnkit (2013). Mockel, Brenker, & Strohschneider (2013) mentioned that safety is the most prominent topics in the maritime domain. Often, it is instantly associated with technological innovation and replacement of traditional nautical instruments. While improving technology and regulatory respective standardization efforts are treated as pillars on which maritime safety rests. The seafaring personnel is often considered as the error-prone and safety-critical element within the world of shipping. The human error is considered as the main cause of many maritime casualties. Still, one could argue that instead of educating the human element in proactive behaviors, training in the use of checklists, handbooks, and standard operating procedures (SOP) is used to illuminate human's supposedly negative impact. Safety improvements shall be among other sources, and based on the analysis of accidents. Critical view of the human factor is limiting the approaches taken towards increasing safety.

Thus, this study was conceived by the researchers to determine the safety and security of the navigational ship among students of maritime university.

## 2 STATEMENT OF THE PROBLEM

In order to understand this present study, the following specific questions were advanced:

- 1 What is the level of evaluation on the safety, security, and protection of the navigational trip in terms of safety among the respondents as an entire group and when the respondents were classified according to section such as Polaris 3-A, Polaris 3-B, and Polaris 3-C?
- 2 Are there significant differences in the level of evaluation on the safety of the navigational trip in terms of safety when classified according to section?
- 3 Are there significant relationships in the level of evaluation on the safety, security, and protection of the navigational trip when classified according to different categories?
- 4 Has the ship passed the international standards in terms of safety and security as perceived by the respondents?
- 5 What are the observations of the marine engineering students about the safety of the navigational trip?
- 6 What are the observations of the respondents about the ship's cleanliness and safety according to respondents during the navigational trip?

## 3 CONCEPTUAL FRAMEWORK OF THE STUDY

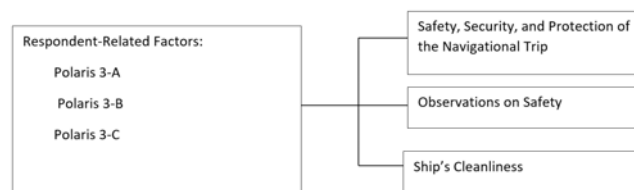


Figure 1. Conceptual framework of the present study

## 4 METHODOLOGY

### 4.1 Research Design

The researchers of this study utilized the quantitative-qualitative research design by Creswell (2013). This research design is appropriate with different sample sizes, a general rule of thumb for qualitative research the samples for a single study involving individual interview usually lie at under 50.

### 4.2 Respondents of the Study

The respondents of the study were the one hundred twenty (120) Polaris marine engineering students who were currently enrolled in the College of Maritime Education of JBLFMU-Molo for School Year 2017-2018. The respondents had undertaken the navigational trip and observed some of the safety and security services on board.

Table 1. Distribution of the Respondents

Category	f	%
A. Entire Group	120	100
B. Section		
Polaris 3-A	40	33.33
Polaris 3-B	40	33.33
Polaris 3-C	40	33.33

4.3 Research Instrument

The research instrument determined the level of safety of the navigational ship of the marine engineering students and had the scales from 10 to 1. The scale of 10 is the highest and scale of 1 is the lowest. The research instrument was subjected to "face and content validity" by the experts, marine officers, and Members of Research Committee of JBLFMU-Molo, Iloilo City. The suggestions, comments, remarks, and opinions of the jurors and experts were considered in the final draft of the instrument. The validated instrument was also pilot-tested to determine the extent of reliability and consistency to the certain municipality which had the same characteristics with the respondents of the present study, which the result was high.

The qualitative data were gathered by using open-ended questions in the data-gathering instrument and interview to capture the views and observations of the respondents as to the safety and security when onboard to their navigational ship.

4.4 Quantitative-Data Analysis

The researchers used frequency count, percentage, and mean as statistical tools for the descriptive data-analysis to determine the level of each category. For the inferential tools, the ANOVA (Analysis of Variance) and Pearson's Coefficient Relationship (r ) were used in this study to determine the significant differences and relationships among the different variables.

4.5 Qualitative Interpretation

The open-ended items in the data-gathering instrument were used as qualitative data to describe and give supplemental information to the researchers about the navigational ship safety and security during

the students' navigational trip as requirement to the course in marine engineering at JBLFMU-Molo, Iloilo City, Philippines.

5 RESULTS AND DISCUSSION

Results in Table 2 reveal that the Polaris students' evaluation of the navigational trip in terms of safety, protection, and security as an entire group was "excellent" as indicated by the mean of 8.24. The respondents of the study also stated that the safety and security on board was "excellently implemented" by the crew of the ship as required. Students of Polaris 3-B had "excellent" evaluation result also on the navigational trip with the mean of 8.28, and the same result with the students from Polaris 3-C, which had "excellent" evaluation as indicated with the mean of 8.15.

Table 2. Level of Evaluation of Safety, Protection, and Security of Navigational Trip among Polaris Students

Category	Mean	Description
A. Entire Group	8.24	Excellent
B. Section		
Polaris 3-A	8.30	Excellent
Polaris 3-B	8.28	Excellent
Polaris 3-C	8.15	High

Legend:  
 8.21-10.00 Excellent  
 6.41-8.20 High  
 4.61-6.40 Moderate  
 2.81-4.60 Poor  
 1.00-2.80 Very Poor

6 DIFFERENCE IN THE LEVEL OF SAFETY AND SECURITY OF NAVIGATIONAL SHIP AMONG POLARIS STUDENTS

The data analysis using ANOVA showed that there was no significant difference in the evaluation of safety and security of navigational ship as the Polaris students classified according to different sections,  $F(2, 117) = 1.312$ . Safety is an imperative requirement. Polaris students saw the need of safety and security during navigational trips.

Data are shown in Table 3.

Table 3. One-Way ANOVA in Navigational Ship's Safety and Security among Polaris Students Grouped According to Section

Variables	Degrees of freedom			Sum of Squares			Mean Squares		F	Sig
	Between groups	Within groups	Total	Between groups	Within groups	Total	Between groups	Within groups		
Section	2	117	119	9.429	70.571	80.0	.857	.653	1.312	.228

Table 4. Relationship of the Evaluation of Safety, Protection, and Security as to the Different Sections

Variables	Polaris 3-A		Polaris 3-B		Polaris 3-C	
	Pearson Correlation (r)	Sig (2-tailed)	Pearson Correlation (r)	Sig (2-tailed)	Pearson Correlation (r)	Sig (2-tailed)
Polaris 3-A	1		.149	.359	-.080	.623
Polaris 3-B	.149	.359	1		.002	.989
Polaris 3-C	-.080	.623	.002	.989	1	

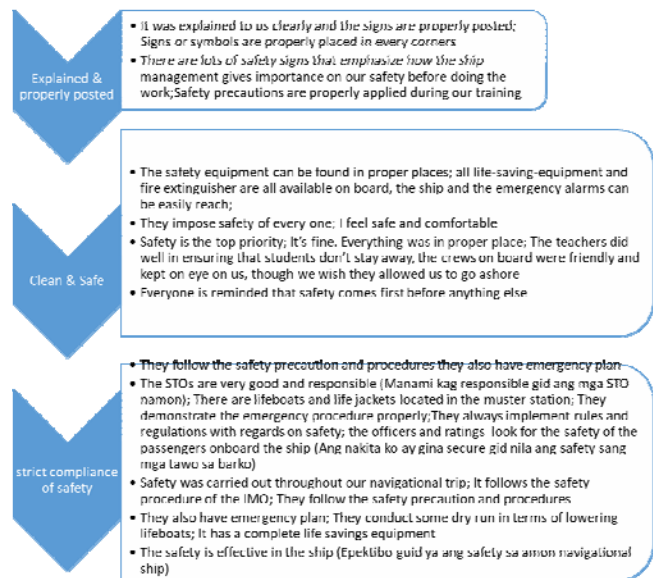
7 RELATIONSHIP OF THE EVALUATION OF SAFETY, PROTECTION, AND SECURITY AS TO THE DIFFERENT SECTIONS

The Pearson’s r results in Table 4 showed that the students’ evaluation on safety, protection, and security was positively and not significantly related according to different sections.

Most of the respondents agreed that the navigational ship has followed the international standards in terms of maritime safety, security, and protection.

Question	Yes	No	Frequency
Is the navigational ship that you have been experienced followed the International standards in maritime safety, security, and protection?			
Polaris 3-A	40	0	33.33
Polaris 3-B	40	0	33.33
Polaris 3-C	40	0	33.33
Total	120	0	100.00

8 QUALITATIVE OBSERVATIONS OF THE POLARIS STUDENTS ABOUT THE SAFETY AND SECURITY OF THE NAVIGATIONAL SHIP



Polaris 3-A Theme

Following International Standard	Clean & Well-Maintained Space	Concern with the Safety & Protection of the Passengers
<ul style="list-style-type: none"> <li>*They were following the MARPOL and other protocols</li> <li>*It follows the safety that is also observed internationally</li> <li>*It is required.</li> <li>*Life saving equipment are available</li> <li>*Equipment meets the international standards.</li> <li>*The ship’s safety and protection equipment are functioning</li> <li>*It is required to follow the international standards in maritime safety and protection</li> <li>*Yes, but there is a need to improve the implementation of safety (Huo pero kinanglan pa guid improvement para safe).</li> <li>*They have the required facilities and equipment on board</li> <li>*We had familiarization which is the main reason of the trip safely.</li> <li>*We strictly follow the rules onboard</li> <li>*The ship has all the required facilities regarding with safety and operational works</li> <li>*They follow the rules regarding waste management and proper segregation of garbage</li> <li>*Everything is in a well-managed -activities</li> </ul>	<ul style="list-style-type: none"> <li>*It is properly maintained</li> <li>*You can’t see any litter.</li> <li>*The rooms are clean and the wastes are properly segregated</li> <li>*Garbage is properly handled</li> <li>*Garbage are properly disposed</li> <li>*Sometimes waste segregation is not followed</li> <li>*Everything was well maintained and cleanliness is well implemented</li> <li>*Cleanliness is properly observed</li> <li>*It is properly cleaned and maintained.</li> <li>*Everything is fine.</li> <li>*Clean and tidy.</li> </ul>	<ul style="list-style-type: none"> <li>*It is their duty and responsibility to secure all passengers</li> <li>*The crew demonstrate on how to use the life jacket</li> <li>*Information about the time of arrival and departure are delivered well</li> <li>*I believe that it is safe to navigate if passengers are well-managed.</li> <li>*They are strict in wearing of PPE (Kay na-estriktuhan kami suksok PPE)</li> <li>*They are strict in terms of safety</li> <li>*Every crew does their duty properly</li> <li>*They are properly trained and know what they are doing.</li> <li>*They always look for our safety first.</li> </ul>

Polaris 3-B Theme

Following International Standard	Clean & Well-Maintained Space	Concern with the Safety & Protection of the Passengers
<ul style="list-style-type: none"> <li>*As we entered the engine room all are wearing their PPE when on duty.</li> <li>*All materials are well prepared to ensure safety.</li> <li>*Our ship is complete in safety equipment.</li> <li>*They need to ensure the safety of their passengers and crew.</li> </ul>	<ul style="list-style-type: none"> <li>*As what I observed the ship was clean and well maintained</li> <li>*So far so good</li> <li>*Ships are properly cleaned.</li> <li>*Cleanliness is observed during the navigational ship</li> <li>*The ship observes proper waste segregation</li> </ul>	<ul style="list-style-type: none"> <li>*They guide their passengers as they go up the gangway.</li> <li>*They conduct mustering and drill in order for the passengers to prepare themselves in terms of accidents on board.</li> <li>*They regularly check every room.</li> <li>*They really ensure the safety of</li> </ul>

- \*They give safety equipment to the trainees on board the ship (Gahatag gid sila sang mga safety equipment para sa mga trainees sabarko).
- \*The ship imposes safety properly.
- \*They give lifejackets and every room has signs on what to do and prohibited things to do in the ship (Ok man may life jacket kada kwarto madamo mga sign sang bawal kag mga dapat ubrahon na makita sapalibot sang barko).
- \*They follow the standard on maritime safety (Gin sunod nla ang standard maritime safety).
- \*They have reached the standard of the ISM when it comes to safety
- \*It is important because maritime safety and protection is necessary. barko).
- \*We can see safety signs everywhere we go
- \*They have installed various life-saving -equipment, alarms, escape routes which are very essential during emergencies

Polaris 3-C Theme

Following International Standard	Clean & Well-Maintained Space	Concern with the Safety & Protection of the Passengers
<ul style="list-style-type: none"> <li>*They have many saving appliances and teach how to use them in order to avoid accidents (Daghan sila life saving appliances, gitudlo pud sa amo ang pagamit and para makalikay sa disgrasya).</li> <li>*Because they have followed the rules and regulations in the Maritime Safety Standard.</li> <li>*It follows all the regulation and safety procedures.</li> <li>*For the safety of the crew or passenger in the ship.</li> <li>*International standard in maritime safety and protection are followed.</li> <li>*Officers such as STO and other crews esp. the signs and symbols pasted along the hallways of the ship help a lot to us and to the other passengers.</li> <li>*In order to avoid any problem that may occur on board.</li> <li>*Before we go to engine room we wore eh).</li> <li>a helmet, coverall, safety boots and safety goggles.</li> <li>*Signs and symbols are clearly posted</li> <li>*They have proper safety procedures (Kay sakto man ang safety ngaginahimo).</li> <li>*The standard of our university is very nice they followed the international standards</li> <li>*They follow the proper safety procedure (Tungod kay proper ila way).</li> <li>*It follows the MARINA Rules.</li> <li>*It is under the protocol which they should not disobey.</li> <li>*To avoid any accidents we must follow the rules.</li> <li>*They have do some trainings</li> <li>*They follow the possible requirements of the IMO</li> <li>*All the information and notices are labelled (Kay ang tanan naka label guid sang insakto kag nagasunod guid sa spot kung din sila naka dapat ibutang).</li> </ul>	<ul style="list-style-type: none"> <li>*They will not let the ship go if the international standards are not followed (Di mana sila makalarga kung wala na follow ang international standards).</li> <li>*Cleanliness of the ship is well maintained.</li> <li>*There is always someone cleaning from time to time.</li> <li>*The ship observed proper management of garbage.</li> <li>*The ship is clean (Limpyu man ang barko).</li> <li>*It is well maintained.</li> <li>*Good</li> <li>*The cleanliness is well maintained.</li> <li>*The ship is clean and well-maintained (Malimpyu kag gina maintain gid nanda ang barko).</li> <li>*Cleanliness is well observed.</li> <li>*The cleanliness is good and well maintained</li> <li>*To have a proper solid waste management on board</li> <li>*Solid waste management is properly implemented</li> <li>*There are designated persons assigned to do the cleaning (May proper man nga tawo ang naga limpyo).</li> <li>*The cleanliness of the navigational ship is already organized because of the proper garbage disposal.</li> <li>*Good</li> <li>*Well maintained.</li> <li>*It is very important.</li> <li>*It is well segregated the different wastes.</li> <li>*Clean is observed (Limpyo gid ka tama).</li> </ul>	<ul style="list-style-type: none"> <li>everybody.</li> <li>*They give announcements and information about the important of safety (Ga hatag gid sila announcements kaggina inform nila ang pasahero about sa kun ano kaimportante and safety equipment).</li> <li>*They check us from time to time.</li> <li>*They are always checking condition of the passengers.</li> <li>*They prepared everything about safety of the passengers.</li> <li>*They show us the proper wearing of life jacket and they show us the different escape routes.</li> <li>*They remind the passengers about the Dos and Don'ts in the ship (Gina remind kami pirmesa Do's and Don'ts sa</li> <li>*Yes, they are well accommodated (Oo, mayo kay sila mag atipan).</li> <li>*Yes, because they well accommodate the passengers safety.</li> <li>*Well maintained.</li> <li>*They always give instructions and announcement every hour.</li> <li>*Life is important than any cargo in the ship.</li> <li>*The crew care for the passenger (Kay obligasyon nanda and safety kapasahero).</li> <li>*The officers are well-prepared in case of accident.</li> <li>* Passenger's life is important so safety and protection were implemented.</li> <li>*Yes because we should have a safety operation for the passengers.</li> <li>*They give instructions.</li> <li>*They cater to the needs and safety of the passengers (Kay ginahatag man nila ang kinahanglan namon kag safety man</li> <li>*They are very accommodating.</li> <li>*They accommodate the passenger well.</li> <li>*It's their job!</li> <li>*It is under SOLAS protocol.</li> <li>*It is important to take care or to follow the safety and protection of the passengers.</li> <li>*They have safety signages on the ship.</li> <li>*The crew are friendly and teach us proper things to do.</li> <li>*The crew and officers look for the cleanliness of the navigational ship (Kay always sila na katutok sa cleanliness sang navigational ship).</li> </ul>

## 9 QUALITATIVE COMMENTS OF THE POLARIS STUDENTS REGARDING THE NAVIGATIONAL SHIP

The Polaris students of sections Polaris 3-A, Polaris 3-B, & Polaris 3-C shared their comments about the navigational ship. The qualitative comments were categorized according to three themes such as the following: (1) following the international standards, (2) clean and well-maintained space, and (3) concern with the safety and protection of its passengers as shown in the next tables.

## 10 CONCLUSIONS

Based on the findings of this study, therefore, the respondents had “excellent evaluation” about the safety, protection, and security of the navigational trip. There were no significant differences in the evaluation of the respondents as to the different sections; no relationships were observed when the respondents’ evaluation results were compared according to sections. The observations and comments cited in this study signify that the navigational trip vessel exhibited safety and security, maintained clean and safe environment, and followed the strict implementation of safety as prescribed by the international standards. The respondents’ comments attested that the navigational trip vessel has implemented the international standard of safety and procedure on board.

## 11 RECOMMENDATIONS

Based on the findings and conclusions of the present study, the following recommendations were advanced:

- 1 Quantitative results of the study shall be discussed with the next batches of students who will be going to navigational trip because of favorable results concerning navigational protection and advocacy.
- 2 Open discussion with the different tie-ups in navigational trips shall be a regular exercise to

maintain the standards of the international communities.

- 3 Qualitative remarks and comments of the students of this study shall be given the Ship-Board Training Officer (SBTO) and Office of the Dean of Marine Engineering to be discussed for further improvement and feed-backing.
- 4 The researchers would like to suggest parallel or more studies on ship security and safety in order to unfold some other related problems pertaining to the factors affecting the ship security and safety prescribed by the international standards of the International Maritime Organizations (IMO).

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