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Education and Aspects of Maritime Security

MARITIME SECURITY IN COASTWISE DOMESTIC SHIPPING AS PERCEIVED BY CADETS

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Abstract. This study focused on the cadets' perception of the level of implementation of maritime security in coastwise trade in selected ports of Western Visayas, Philippines, based on the ISPS Code requirements applicable onboard vessels and in port. This study aims to: (1) Determine the level of implementation of domestic companies in terms of the ship security plan or certificate, security drills, control of visitors on board, identification of restricted areas onboard, and security equipment used; (2) Identify the challenges that domestic vessels experience in the implementation of these procedures; and (3) Find out how the cadets are engaged in the process of implementing the requirements in terms of security drills and control of visitors on board and the roles they are tasked to perform. A research-made instrument designed for cadets was used to gather the data. The results revealed that domestic companies' implementation is heightened during MARSEC Level 2, which happens when there is a heightened level and when security risk has become visible to security personnel. The greatest challenge as perceived by the cadets was specifically on technology advancement, which affects the security and equipment of the domestic vessels. The cadets are engaged in implementing the ISPS code on security drills and control of visitors on board by performing the roles assigned to them by their senior officers. Based on this study's results, it is recommended that emphasis must be given on topics in maritime security for the students to be equipped with this knowledge during their cadetship program. Training centers may enhance the maritime security training's effectiveness to include Seafarers with Designated Security Duties, Security Awareness Training, and Ship Security Assessment.

Keywords: maritime security; domestic shipping; ISPS code; level of implementation

Introduction

Maritime security is currently one of the critical concerns of the maritime industry. In the maritime industry, it is characterized by the absence of threats such as maritime inter-state disputes, maritime terrorism, piracy, trafficking of narcotics, people and illicit goods, arms proliferation, illegal fishing, environmental crimes,

or maritime accidents and disasters (Klein 2011; Kraska & Pedrozo 2013; Roach 2004; Vreÿ 2010; Very 2013).

In the past decades, there had been a resurgence of threats related to piracy. This threat to maritime security continues to lurk in waters from the Atlantic to the West Pacific. According to the International Maritime Bureau Piracy Report (2014), oil tankers and bulk carriers are the most at risk of being attacked since they are easy-to-board, slow-moving cargo vessels with valuable cargoes.

The vigilance of the naval forces has caused a decrease in piracy incidents in the Gulf of Aden, the Arabian Sea, and the Indian Ocean. However, other waters off the coast of Nigeria and between the many islands of Indonesia have seen an upsurge of reported cases of piracy. Even with the International naval forces patrolling the world's water, shipping companies are still accountable for establishing their security measures to protect their vessels and crews (Top 10 Tips for Maritime Security, n.d.).

Certain international and domestic laws and policies have been created to protect and promote maritime security. Countries around the world have taken initiatives in guarding national maritime safety. One example is the Maritime Transportation Security Act of 2002 (also known as MTSA), which the United States government enacted to enhance seaports.[1)] Then there is the Admiralty Jurisdiction Decree No 59 of 1991, which the Federal Government of Nigeria enacted to help monitor its inland waterways and its share of the high seas.(Ayorinde et al. 2014)

The Philippine government, in particular, also implemented some regulations and guidelines to safeguard its waters. One was establishing a Recommended Transit Corridor (RTC) between Moro Gulf and Basilan Strait, where vessels must notify relevant authorities before transit. This safe passage was created in response to the rising cases of piracy and kidnapping incidents involving ships navigating in these areas. Law enforcement units are deployed to respond immediately to piracy and armed robbery incidents against ships[2)]. Another was the implementation of Safety, Security and Environmental (SSEN) Numbering Systems for all Philippine-registered vessels for improved tracking and monitoring; and the prescription of radio communication equipment onboard Philippine-registered vessels[3)].

However, threats to maritime security continue to be experienced by vessels plying across both international and domestic territories. The dangers posed by threats to security at sea are among the realities that Maritime Higher Educational Institutions (MHEIs) are preparing their cadets. As producers of future seafarers, the institution's curriculum for Bachelor of Science in Marine Transportation and Bachelor of Science in Marine Engineering highlights the importance of maritime safety and security through the inclusion of the International Ship and Port Facility Security (ISPS) Code in Maritime Law in the College of Maritime Education, as well as in Maritime Training Centers for the training course on Ship Security Awareness and Seafarers with Designated Security Duties (SDSD) for BSMT and BSMarE graduates.

With maritime security being vulnerable to risks and threats, particularly in domestic shipping, this study attempts to gather insights based on the perceptions of cadets who have spent their shipboard training onboard domestic vessels, particularly on the level of implementation of maritime security based on the ISPS Code requirements applicable onboard vessels and in port. Insights from this investigation will allow us to identify weak areas in implementing the ISPS Code in the region for the continued revision of the contents of related courses in the maritime education curriculum. Recommendations from this study may be shared with authorities in domestic ports to sustain and build strategies on addressing orderly migration while being aware of the state of maritime safety and security from the global perspective.

Framework

This study is anchored on the Risk theory, which begins with identifying the threat, specifying the risk associated with the threat, and identifying measures to overcome the risk. Where there are threats, there is an element of risk, defined as a situation or event where something of great value (including humans themselves) is at stake (Rosa 1998, cited in Eidnes et al. 2019). The application of the risk theory evaluates which threats affect the reference object and which ones have a more or less significant impact. This evaluation is done to mitigate the impact of threats and to plan out measures of counteracting the threats.

The Risk Theory supports this study for it has the same aim and goal. The theory states that risk assessment should be implied to ensure people's welfare and to guarantee everyone's safety and security. The ISPS Code aims to look into the security aspects of the ship, seafarers, ports, and port workers to ensure that preventive measures can be taken if a security threat is determined[4)].

The International Maritime Organization (IMO) has authored and developed several maritime regulations and laws, including the implementation of the International Ship and Facility Security Code (ISPS) and the Port Security Initiative (PSI) (Pegna 2013). To enhance maritime security in the global scenario, ships must implement protection measures such as watch keeping and enhanced surveillance to increase the chances of thwarting pirate attacks (Bryant et al. 2014). The ISPS Code mandates that every vessel must have a Ship Security Plan (SSP). The SSP also contains information on access control onboard, monitoring the restricted areas, cargo handling, and receiving stores/baggage. The SSP must be protected from unauthorized access or disclosure and is under the responsibility of the Ship Security Officer (SSO) who is in charge of security of the vessel onboard and the person responsible for ensuring that the entire crew member should carry out their duties as required[4)].

Given these frameworks, this study attempted to determine the level of implementation of maritime security based on the ISPS Code requirements applicable onboard vessels and in port based on the perception of Deck and Engine

cadets who had been on board these vessels during their shipboard training. It should be mentioned here, however, that only those requirements for which the cadets had access were included in this study. This paper also aimed to determine the challenges experienced by domestic vessels in implementing these requirements as observed by cadets and to identify the different roles assigned to cadets in implementing these requirements. The concept of this study is shown in Figure 1.

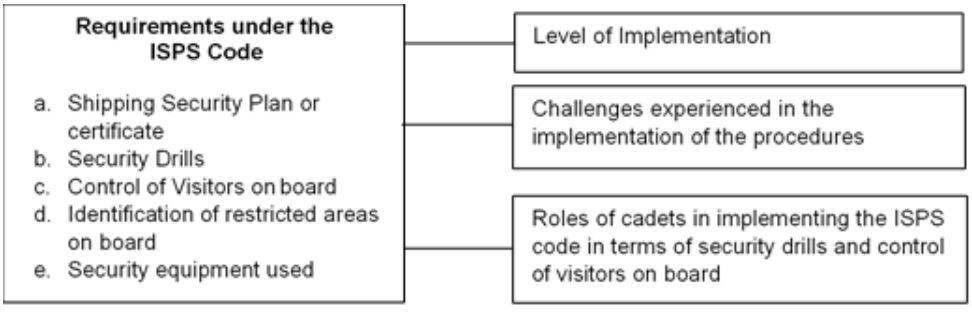

Figure 1. Schematic diagram of the conceptual framework

Objectives

The main objective of this study was to determine the level of implementation of maritime security based on the **ISPS Code requirements applicable onboard vessels and in selected ports** of Western Visayas, Philippines. The following specific objectives were covered in the study:

1. To determine the level of implementation of the following requirements in the ISPS Code based on the perception of cadets during their shipboard training
   a. Shipping Security Plan or certificate
   b. Security Drills
   c. Control of Visitors on board
   d. Identification of restricted areas onboard
   e. Security equipment used
2. To identify the challenges observed by the cadets in implementing these requirements
3. To find out the roles the cadets are made to perform in the process of implementing the said requirements

Methods

This study utilized the descriptive research design, which according to (Tatum 2021), is used when the researcher wants to describe specific behavior as it occurs in the environment. The survey method was used to gather the needed data.

The respondents of this study were composed of 25 Deck cadets and 25 Engine Cadets of a maritime educational institution in the Philippines. These cadets had undergone and completed their 12-month shipboard training onboard domestic vessels. They were selected using purposive sampling, defined as an intentional selection of informants based on their ability to elucidate a specific theme, concept, or phenomenon (Robinson 2014).

A researcher-made questionnaire, validated by experts in the field and tested for reliability using Cronbach's alpha, was used in this study. The validation test obtained a mean score of 4.08, interpreted as very good, while the reliability test obtained an alpha coefficient of 0.89, interpreted as good.

The survey was administered to the respondents in December 2019 before the pandemic after adhering to specific protocols and obtaining the approval of the authorities concerned. Due to the element of time and space, considering that some of the respondents were on board or residing elsewhere, the researchers sent the survey questionnaire through e-mail or private message. The respondents who could be easily reached were asked to answer the survey in their respective locations and were given ample time to answer.

Mean and Standard Deviation were used to determine the level of implementation of maritime security requirements applicable onboard vessels and in port. To interpret the mean, the following scale was used:

Scale	Interpretation
3.25 – 4.00	Fully Implemented
2.50 – 3.24	Mostly implemented
1.75 – 2.49	Partially implemented
1.00 – 1.74	Seldom implemented

Frequency count and rank were used to report the challenges experienced by domestic shipping in implementing these requirements. Thematic analysis was used to determine the cadets' roles in implementing the said requirements. According to (Braun et al. 2018), thematic analysis is a method for capturing patterns or themes across qualitative datasets.

Results and discussion

This section reports and discusses the results derived from the gathered data based on the study's objectives.

Implementation of ISPS code requirements for Port Facilities in Domestic Shipping as Perceived by the Cadets

It should be remembered that only those requirements of the ISPS Code for which the cadets have access onboard and in the ports they have entered were included in this study. Due to this limitation, not all requirements of the ISPS Code were included

in the survey. The requirements covered in this study include Shipping Security Plan and Certificate, Security Drills, Control of Visitors on Board, Identification of Restricted Areas on Board, and Security Equipment Used.

Table 1 shows that the Deck and Engine cadets have varied perceptions regarding the implementation of the ISPS Code requirements. However, as a whole, it was generally perceived that the requirements were fully implemented by domestic shipping in the region. In Table 1, it can also be noted that the use of security equipment on board and in port was only observed most of the time. A possible explanation for this finding is that most of the ports included in the vessels' ports of destination have a lower level of security threats; hence, the use of the security equipment is not fully optimized. According to (Kothari 2008), security threats to or from ships vary with location. Nevertheless, the cadets have noted that the vessels they have boarded contain the complete list of security equipment required under the ISPS Code.

Table 1. Level of implementation of the requirements in the ISPS code as perceived by Cadets

ISPS Code Requirements	Deck Cadets			Engine Cadets			As a whole		
	Mean	SD	Interpretation	Mean	SD	Interpretation	Mean	SD	Interpretation
Shipping Security Plan or certificate	3.50	0.68	Fully Implemented	3.83	0.59	Fully Implemented	3.67	0.76	Fully Implemented
Security Drills	3.41	0.71	Fully Implemented	3.66	0.76	Fully Implemented	3.54	0.83	Fully Implemented
Control of Visitors on board	3.31	0.86	Fully Implemented	3.56	0.85	Fully Implemented	3.44	0.72	Fully Implemented
Identification of restricted areas onboard	3.64	0.57	Fully Implemented	3.73	0.78	Fully Implemented	3.69	0.78	Fully Implemented
Security equipment used	3.10	0.93	Mostly implemented	3.26	0.87	Fully Implemented	3.18	0.90	Mostly implemented
Total	3.38	0.81	Fully Implemented	3.61	0.96	Fully Implemented	3.50	0.68	Fully Implemented

Challenges Experienced by Domestic Shipping in Implementing the ISPS Code Requirements

Table 2 reveals the challenges experienced by domestic shipping in implementing the ISPS Code Requirements as perceived by the cadets. The data show that the biggest challenge is that security and technology are changing rapidly. In coping with this change, specialized skills are needed in utilizing more advanced technology to capacitate port officials and vessels to enhance their security measures. From the perceptions of the cadets, this aspect still needs to be strengthened.

Port facilities are generally connected to the road, rail, and inland waterways networks (Kothari 2008). The cargoes received come in different forms and packaging, and the primary role of the Port Facility Security Officer is to ensure that the cargoes transported are not illegal. Passengers, workers, and transporters who have access to the port facilities need to be thoroughly screened for any illegal items when entering and leaving the port. With the same tenacity, people boarding the vessels also need to be strictly inspected to ensure that the security of the vessel and the safety of the people and the cargoes on board will not be put at risk. According to the same source, "a vigilant inspection should be done to prevent unauthorized entry and to detect any intrusion by an unauthorized person who may cause sabotage or engage in any other illegal activities that may imperil maritime security (p. 39)."

Adopting technology to ensure maritime security must not only end on compliance with the minimum requirement of what essential security equipment should be available onboard vessels and in port according to the ISPS standards. As the level of security threats increases and changes over time, the use of more advanced security equipment and technology also needs to be calibrated. In this study, the cadets have noted that modern scanners to detect drugs, weapons, and explosives are not present or not fully implemented in some ports in the region. Security inspections in these ports are still being done manually.

Table 2. Challenges observed by the cadets in implementing ISPS code requirements in domestic vessels

Challenges	**f**	**Rank**
The recognized impact of a security breach	26	**3**
The skills gap on the use of technology	45	**2**
The explosive growth in endpoints	23	5
The digital-physical convergence	25	4
Security and technology is changing rapidly	46	**1**

Another challenge worthy of attention that the cadets identified was the gap in skills (Shown second in Table 2). In global research conducted by the Lloyd's Maritime Academy, it was revealed that over 67% of people surveyed believe that there is a skills gap within the maritime sector, and about 20% indicated a gap within technology and IT [5)]. Over the years, the nature of work required in the maritime sector continues to evolve. Along with this change is the rapid modernization of technology which requires more advanced knowledge and skills. In the context of maritime security, as perpetrators adopt more creative tactics, the level of security threats also elevates, and consequently, the need for more advanced security measures also intensifies. Emerging technologies characterized by digitalization,

automation, and cybersecurity have been developed. As a result, the skills that employers and companies value and depend on are also transforming, creating a "skills gap" [6].

Cadets' Roles in Implementing the ISPS Code Requirements

Both deck and engine cadets were much engaged in implementing security procedures. Deck cadets were assigned to search and monitor persons coming on board, check the identification of every person who goes on board; watch the gangways, do security rounds to check the vessel from bow to stern. They were also assigned to watch the ship's perimeter for possible stowaways and make security rounds. The engine cadets were assigned to secure the cabins and restricted areas when visitors were on board or when the ship is at the port. They also did the roving patrol in Marine Security Level 2, searched for drugs and stowaways, guided the visitors, and secured the exit and entrance doors.

Conclusions

Perception, as a cognitive process, is based on our experiences and collective assessments of how we make sense of the events and situations around us. From the perspective of the cadets, the perceptions objectified in this study were based on their first-hand experience of how the ISPS requirements on maritime security were actually implemented and practiced onboard the domestic vessels where they spent their shipboard training for 12 months and in the various ports they have entered. The testimonies gathered from the cadets gave the impression that the requirements listed under Shipping Security Plan, Security Drills, Control of Visitors on board, and Identification of Restricted had been fully implemented, except the use of security equipment which they reported to be mostly implemented only.

With the security equipment in place during security inspections, the expected level of security can be achieved. Security equipment manufacturers produce a complete range of standard and custom alarm systems. These systems, which are designed to respond to proximity, movement, temperature change, and/or a multitude of other environmental triggers, are engineered to protect virtually any object, individual, vehicle or location. To further enhance the Maritime Education and Training programs, the authors suggest that with modern-day learning, the cadets should be introduced to actual utilization of these security equipment which covers a wide assortment of protection, identification, surveillance and detection devices through practical training with qualified and competent instructors aside from theoretical learning. A combination of vigilance, strict implementation of the security systems, and familiarity with modern security equipment can provide better safety results. The biggest challenges that the cadets have noted are the rapid change in technology resulting from the increased level of maritime security threats and

the skills gap, which needs to be narrowed down through intensified training among maritime personnel responsible for ensuring the strict implementation of the ISPS Code requirements.

In training future marine officers of domestic and international vessels, maritime institutions should consider enhancing the curriculum for BS in Marine Transportation and Marine Engineering Programs and the course content in Maritime Law to highlight the ISPS Code requirements and the roles of the ship's personnel in implementing them. It is also recommended that the cadets should be exposed to simulation or role-playing activities in given situations depicting different maritime security levels.

Course enhancement for BS in Marine Transportation and Marine Engineering programs should be considered mainly because of modernization and the transition in the mode of education today. As mentioned by the authors, this study is based on the ISPS Code requirements applicable onboard vessels and in port. Emphasis in MET should be given to domestic shipping particularly in terms of the standard approaches for risk assessment, identifying the threat, specifying the risk associated with the threat, and identifying measures to overcome the risk.

Despite the vigorous implementation of the ISPS Code requirements in domestic shipping, the maritime industry should not turn complacent and lenient in ensuring consistency in implementing strict measures to prevent unwanted situations from happening. Whether or not there is a threat to maritime security, the ISPS Code must be held strictly.

NOTES

1. What is the Maritime Transportation Security Act of 2002? (2015, December 3). *The Young Firm*. https://www.jonesactlaw.com/faqs/what-is-the-maritime-transportation-security-act-of-2002/
2. PortCalls Asia. (2017, June 1). PH shipping lines start using safe transit corridor. *PortCalls Asia*. https://www.portcalls.com/ph-shipping-lines-start-using-safe-transit-corridor/
3. Philippine Information Agency. 2017, September 11. Coast Guard all set for numbering of sea-operating vessels. https://pia.gov.ph/news/articles/1000200
4. *The ISPS Code For Ships - An Essential Quick Guide*. (2020, December 1). Marine Insight. https://www.marineinsight.com/maritime-law/the-isps-code-for-ships-a-quick-guide/
5. SAFETY4SEA, 2019 [September, 13]. *Maritime industry needs to do more to mitigate the skills gap*. https://safety4sea.com/maritime-industry-needs-to-do-more-to-mitigate-skills-gap/

6. SAFETY4SEA, 2020 [December, 29]. *The skills gap in the maritime sector*. https://safety4sea.com/cm-the-skills-gap-in-the-maritime-sector/
7. *Top 10 Tips for Maritime Security*. (n.d.). Retrieved April 19, 2021, from http://www.crewtoo.com/featured-news/10-tips-for-maritime-security/

REFERENCES

2014-Q3-IMB-Piracy-Report-ABRDGED.pdf. (n.d.). Retrieved April 19, 2021, from https://www.hellenicshippingnews.com/wp-content/uploads/2014/10/2014-Q3-IMB-Piracy-Report-ABRDGED.pdf

Ayorinde, B. et al., 2014. *Maritime Claims–Practices, Procedures and Enforcements—Transport—Nigeria*. https://www.mondaq.com/nigeria/marine-shipping/293392/maritime-claimspractices-procedures-and-enforcements

Braun, V., Clarke, V., Hayfield, N., & Terry, G., 2018. Thematic Analysis. In: P. Liamputtong, Ed. *Handbook of Research Methods in Health Social Sciences.* Springer, 1 – 18. https://doi.org/10.1007/978-981-10-2779-6_103-1

Bryant, W., Townsley, M., & Leclerc, B., 2014. Preventing maritime pirate attacks: A conjunctive analysis of the effectiveness of ship protection measures recommended by the international maritime organization. *Journal of Transportation Security* **7**(1), 69 – 82. https://doi.org/10.1007/s12198-013-0130-2

Eidnes, I. B., Batalden, B.-M. E., & Sydnes, A. K., 2019. *Maritime Security and Threat Assessments*. https://doi.org/10.12716/1001.13.04.02

Klein, N., 2011. *Maritime Security and the Law of the Sea*. OUP Oxford.

Kothari, B. S., 2008. *The role of technology in maritime security: A survey of its development, application, and adequacy,* 141.

Kraska, J., & Pedrozo, R., 2013. *International Maritime Security Law*. Martinus Nijhoff Publishers.

Pegna, M. R., 2013. US Arctic Policy: The Need to Ratify a Modified UNCLOS and Secure a Military Presence in the Arctic. *Journal of Maritime Law and Commerce*. **44**(2), 169 – 194.

Roach, J. A., 2004. Initiatives to enhance maritime security at sea. *Marine Policy*. **28**(1), 41 – 66. https://doi.org/10.1016/j.marpol.2003.10.010

Robinson, R. S., 2014. Purposive Sampling. In: A. C. Michalos, ed. *Encyclopedia of Quality of Life and Well-Being Research* Springer Netherlands, 5243 – 5245. https://doi.org/10.1007/978-94-007-0753-5_2337

Tatum, Ray, 2021. *Descriptive Research Design: Definition, Example & Types – Psychology Class [2021]*. Study.Com. https://study.com/

academy/lesson/descriptive-research-design-definition-example-types.html

Vreÿ, F., 2010. African Maritime Security: A time for good order at sea. *Australian Journal of Maritime & Ocean Affairs* **2**(4), 121 – 132. https://doi.org/10.1080/18366503.2010.10815667

Vrey, F., 2013. Turning the tide: Revisiting African Maritime security. *Scientia Militaria: South African Journal of Military Studies*. https://www.ajol.info/index.php/smsajms/article/view/97390

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