

STRATEGIC INTERVENTIONS TO UPHOLD PHILIPPINE MARITIME SAFETY

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Adventist Colleges Research Association

DOI: <https://doi.org/10.56293/IJMSSSR.2025.5502>

IJMSSSR 2025

VOLUME 7

ISSUE 2 MARCH – APRIL

ISSN: 2582 – 0265

Abstract: Maritime safety and capabilities is one of the predications and primary mandates of any Coast Guard. The Philippines is no exception to this.

This research determined the attributes that contribute to towards the effective implementation of this capabilities based from the empirical and actual responses of selected Coast Guard Personnel themselves. In detail, the following significant results were presented:

1. On the matters of Conducting Pre-Departure Inspections (PDI), Beaches and Resort Inspections and Lighthouses and Buoy Inspections, the respondents indicated that they utterly agree to the importance of such attributes towards the sheer implementation of maritime safety and capabilities.
2. Challenges include proper resource allocation, consistent and perennial training, among other competence and leadership-based attributes. These can be addressed through the periodic and dedicated provision of such programs that are to be integrated in the fiscal calendar of the Philippine Coast Guard in order to make the personnel competitive, prepared and ready all the time.

Keywords: Maritime Safety and Capabilities, Personnel Competence, Leadership

PROBLEM RATIONALE

Maritime safety encompasses various measures aimed at safeguarding lives and property in maritime environments. The guidelines are primarily derived from the International Convention for the Safety of Life at Sea (SOLAS). These provisions include regulations on the frequency of ship inspections and the use of approved life-saving equipment.

Under Republic Act 9993, the Philippine Coast Guard (PCG) is required to enforce regulations with all relevant maritime international conventions, treaties, or instruments of which the government is signatory and national laws.

The PCG serves as a crucial government security force responsible for upholding maritime laws, ensuring safety at sea, protecting the environment, and securing the nation's maritime borders. Its extensive responsibilities include search and rescue (SAR) operations, law enforcement, environmental conservation, and providing aid during maritime emergencies (Gonzales, 2021).

Maritime Safety or MARSAF function is designed to help prevent or minimize unnecessary loss of life and property at sea.

As maritime trade continues to expand, the Philippine Coast Guard (PCG) faces growing challenges, including piracy, environmental protection, and the need for enhanced safety protocols. Recent trends indicate a move towards integrating advanced technology and training methods to improve the skills of personnel, especially those in sub-station roles.

These personnel are crucial in managing Coast Guard Sub-stations, ensuring their units are ready to respond to emergencies, uphold law and order, and safeguard the maritime domain. Therefore, it is essential for them to possess the requisite qualifications, attend seminars, and undergo technical training to effectively carry out their duties and responsibilities.

Hence, personnel's qualifications are critical in ensuring maritime safety, security, and environmental protection – more so, given the country's extensive coastline and numerous islands. To effectively fulfill these responsibilities, Coast Guard personnel must possess a diverse set of qualifications and undergo rigorous training, such as:

1. **Educational Background:** A bachelor's degree or at least vocational course, or related disciplines is typically required. This educational foundation equips personnel with the technical knowledge and critical thinking skills necessary for their roles;
2. **Physical Fitness:** personnel must meet specific physical fitness standards and undergo comprehensive medical examinations. This ensures that they can handle the demands of the job, which often includes physically challenging situations;
3. **Training:** Personnel's may need additional training in areas like search and rescue, maritime safety, environmental protection, and disaster response. Such training prepares them for the unique challenges they will face in their duties.

This research was predicated to present practical recommendations that align with the International Maritime Organization's (IMO) International Safety Management (ISM) Code and the principles set forth in the Philippine maritime policy framework. By integrating simulation-based training and advanced educational methods, we can significantly reduce human error and enhance safety outcomes.

Beyond addressing conventional safety issues, this study also aims to contribute to the ongoing dialogue on maritime safety by examining contemporary challenges and the integration of technological advancements. By improving the capabilities of Philippine Coast Guard (PCG) personnel, the research seeks to cultivate a safety culture that not only protects lives and the environment but also ensures the sustainability of maritime operations in the Philippines. Ultimately, strengthening the safety competencies of sub-station personnel aligns with national objectives for maritime safety and security, enabling the PCG to fulfill its mandate effectively.

General Objective:

This study is anchored towards assessing the knowledge and capabilities of sub-station personnel in maritime safety operations. Specifically, it answered the following:

1. The personnel's competency level in maritime safety operations terms of:
 - a. Conducting Pre-Departure Inspections (PDI)
 - b. Beaches and Resort Inspections
 - c. Lighthouses and Buoy Inspections
2. Determine the competency gaps and challenges faced by personnel in performing these maritime safety functions.
3. Propose training and seminar programs to address these gaps and improve operational performance.

Study Framework

This study adopted its framework from the general competence and leadership paradigm of the United States Coast Guard. The proponents intended to benchmark this study with a higher level of practice – ergo this conformed parameter.



Source: United States Coast Guard
<https://www.mycg.uscg.mil/News/Article/3065412/calling-all-leaders-coast-guard->

In order to develop one’s competency to ensure maritime safety, leadership from within is imperative. The personnel’s definitive maritime awareness and competencies to overcome challenges all starts from the initiative to become a good leader of oneself and how it would translate towards serving others. Programs that enhance these skills are very important – ergo the fulfillment of the above-mentioned set of objectives.

In detail, a paradigm of coast guard competency involves a multi-faceted approach that includes:

1. Technical Skills: Proficiency in navigation, ship handling, weapons systems, and engineering.
2. Operational Skills: Expertise in search and rescue, law enforcement, maritime security, and environmental protection.
3. Leadership and Management Skills: Ability to lead and manage teams, make decisions under pressure, and communicate effectively.
4. Professionalism and Ethics: Adherence to the highest standards of conduct, integrity, and ethical behavior.

RESEARCH METHODS

This study had 100 personnel from randomly selected detachments served as respondents. They were asked mixed method sets of questions from their basic profile up to how they see the challenges of being competent personnel and how programs to enhance such skills will be beneficial.

The following are the respondents’ profile:

Table 1. Respondents' Gender	
Male	55
Female	45
TOTAL	100

Table 2. Respondents' Age Bracket	
Bracket	Frequency
25 - 30	35
31 - 35	45

35 Above	20
TOTAL	100

Table 3. Years of Service	
Years	Frequency
Less than 1	10
2 - 5 Years	40
5 - 10 Years	35
Longer than 10 years	15
TOTAL	100

The respondents are basically and equitably divided and clustered in order to derive objective results.

Functional Terms

The following functional terms were used to present the context of this study:

1. Leadership

Philippine Coast Guard leadership emphasizes integrity, accountability, and resilience, as officers and personnel are entrusted with enforcing maritime laws, conducting search and rescue operations, and responding to disasters. Effective leadership in the PCG requires strategic decision-making, teamwork, and adaptability to address evolving maritime threats and challenges.

Moreover, leadership in the PCG extends beyond command authority; it involves fostering a culture of professionalism, continuous learning, and public service. Strong leadership ensures that the organization remains mission-ready and capable of safeguarding the country's maritime interests.

2. Maritime Safety

This refers to the implementation of measures, regulations, and operations aimed at protecting lives, property, and the marine environment within the country's waters. It encompasses a wide range of responsibilities, including search and rescue (SAR), vessel safety inspections, navigational aid maintenance, oil spill response, and disaster risk reduction.

3. Personnel Capabilities

These are the skills, knowledge, and competencies required of its officers and crew to effectively perform their duties in ensuring maritime safety, security, law enforcement, and environmental protection. These capabilities are developed through rigorous training, education, and hands-on experience in various maritime operations.

To enhance personnel capabilities, the PCG invests in continuous training, capacity-building programs, and modernization efforts, ensuring its workforce remains prepared to address evolving maritime challenges and safeguard the nation's waters effectively.

Statistical Analysis

This study will use Analysis of Variance in order to determine if the answers of the respondents across and in every question that they will be asked to answer would be consistent – or not. In detail, the following were statistically determined:

1. Assessing Performance Across Different Units

The Philippine Coast Guard has multiple units that operate in different regions, such as maritime patrol, rescue, enforcement, and more. ANOVA can be used to assess the performance of these units across various metrics, such as:

- a. Response time to emergencies
- b. Effectiveness of maritime law enforcement
- c. Efficiency in resource allocation.

By applying ANOVA, the PCG can identify if there are significant differences in performance between regions or specific units. If one unit consistently performs better, it may indicate best practices that can be implemented across other units.

2. Evaluating the Impact of Training Programs

The PCG conducts various training programs for its personnel. ANOVA can help in determining the effectiveness of these programs by comparing the performance of personnel before and after training.

3. Improving Safety and Operational Effectiveness

ANOVA can also be applied to operational data to understand safety and efficiency. For instance, the PCG could use ANOVA to analyze the frequency of accidents or incidents in different types of missions (e.g., search-and-rescue, law enforcement, environmental protection). If there's a significant difference in the number of incidents across mission types, it may suggest a need for more focused attention or training in the higher-risk areas.

Certain deviations and differences would mean that they may have different experiences and perceptions based from their current work and tasks at hand in carrying out their duties.

RESULTS AND DISCUSSION

This part presented the overall and detailed responses of the personnel being subjected to the study.

Personnel Competency (Objective 1)

This answers the first objective. Based on the parameters given, using a 5-Point Likert Scale wherein 5 is the highest output and 1 is the lowest, the respondents rated perceived criteria based on their actual practice and performance. The set acceptable rating is 3.50 / 5.00 or 70%.

Likert Rating	Interpretation
5	Strongly Agreeing to the attributed presented
4	Moderately Agreeing to the attributed presented
3	Neutral or Undecided
2	Moderately Disagreeing to the attributed presented
1	Strongly Disagreeing to the attributed presented

Conducting Pre-Departure Inspections (PDI)

ATTRIBUTE	RATING
Ensuring vessel safety and compliance with regulations before departure.	5
Reduced maritime accidents due to mechanical failures or safety violations	5

Increased awareness among vessel operators regarding safety equipment and procedures	5
Improved overall safety culture within the maritime community.	5
Verification of required documentation and equipment.	5
MEAN RATING	5.00

This area is fundamentally for strict compliance and in their own words, “Non-Negotiable.” As expected, each rating must not get below 5.00 since a failure in compliance will definitely result to potential accidents, catastrophes and other untoward incidents.

Beaches and Resort Inspections

ATTRIBUTE	RATING
Ensuring the safety and security of beaches and resort areas	4
Reduced incidents of drowning, injuries, and other accidents.	5
Improved personnel performance and response times.	4
Increased public awareness of beach safety hazards.	4
Compliance with environmental regulations and protection of natural resources.	5
MEAN RATING	4.40

The below-5 responses are those attributed to the challenges of needing more personnel to carry out each task at hand. Practically and according to them, the Coast Guard is still undermanned.

Lighthouses and Buoy Inspections

ATTRIBUTE	RATING
Maintaining the reliability and accuracy of navigational aids.	4
Reduced maritime accidents due to navigational errors	5
Improved efficiency of maritime transportation.	4
Timely identification and repair of damaged or malfunctioning aids to navigation.	4
Accurate positioning and visibility of maritime equipment	4
AGGREGATE MEAN RATING	4.20

In spite of the current high budget, the respondents believe that the equipment of the PCG needs to be further upgraded.

Challenges (Objective 2)

Carrying out Coast Guard duties presents numerous challenges, ranging from environmental factors to operational constraints.

In detail and in narrative, here are the main challenges faced by Coast Guard personnel as given by the respondents:

1. Resource Concerns

Proper Budget Allocation - One of the major ongoing challenges is funding. The Coast Guard, in spite of having a large funding for this year, still operates at a meager revolving capital. This affects and constrains the acquisition of new equipment, the maintenance of vessels, aircraft, and infrastructure, and the training of personnel. This makes it harder to keep up with technological advancements or increase the size of patrol fleets.

Aging Equipment - They are operating with outdated equipment. Older ships and equipment require more maintenance and are often less effective in modern operations. This can impact the speed and efficiency of mission execution.

2. Coordination with Other Agencies

Interagency Collaboration – The organization often needs to work with other agencies, such as the offices in environmental, law enforcement, and search and rescue organizations. Coordination between these agencies can be challenging, particularly in complex operations, where communication and standardization of procedures are critical for success.

Jurisdictional Issues: When conducting operations in international waters or contested maritime zones, The Coast Guard may face jurisdictional challenges, particularly in enforcement activities such as patrolling fishing rights, immigration control, or anti-piracy missions.

3. Training and Personnel Challenges

Skilled Personnel: Coast Guard require highly specialized personnel, including navigators, rescue teams, pilots, engineers, and law enforcement officers. Ensuring that they are well-trained to handle diverse and often dangerous tasks is a significant challenge. Training programs are resource-intensive and must be continually updated.

Stress and Fatigue: Personnel are often required to work long hours in stressful conditions. This can lead to mental and physical fatigue, particularly in extended search-and-rescue operations or during long patrols. It requires careful management of work schedules and resources to ensure the well-being of the crew.

From a set of perceived current actions as to how PCG currently addresses it challenges, the respondents have indicated their answers using the same 5-Point Likert Scale Matrix, wherein:

Likert Rating	Interpretation
5	Strongly Agreeing to the attributed presented
4	Moderately Agreeing to the attributed presented
3	Neutral or Undecided
2	Moderately Disagreeing to the attributed presented
1	Strongly Disagreeing to the attributed presented

Their responses with the computed Mean Ratings are as follows:

PCG'S RESPONSE TO CHALLENGES	RATING
The Philippine Coast Guard efficiently and effectively addresses issues related to outdated or insufficient maritime equipment	4.50
The Philippine Coast Guard is active in updating its innovation and technology in conducting search and rescue operations	5.00
The Philippine Coast Guard is committed towards enhancing the training and preparedness of PCG personnel in handling maritime disasters and emergencies	4.20
The Philippine Coast Guard is active in collaborating with local and international organizations to improve maritime safety and security?	4.40
The Philippine Coast Guard is persistent in uploading maritime laws	4.00
AGGREGATE MEAN RATING	4.52

The trust of the personnel is still high in terms of how PGC addresses the current challenges.

Programs for Improvement (Objective 3)

The following were the respondents' recommendations to improve the Philippine Coast Guard in terms of the study at hand.

First off, they mentioned addressing the challenges requires a combination of policy initiatives, technological advancements, resource management, and international collaboration. Here are some possible programs and strategies that could help solve these issues:

Modernization and Investment in Technology

1. Fleet and Equipment Modernization

Objective: Upgrade aging fleets and equipment with newer, more efficient ships, aircraft, and communication systems. This includes replacing older cutters, aircraft, and radars with next-generation technologies.

Details: Governments should prioritize funding for fleet modernization programs, ensuring that vessels are capable of handling adverse weather conditions and equipped with the latest technologies for navigation, communication, and surveillance.

2. Implementation of Advanced Surveillance and Monitoring Systems

Objective: Deploy advanced monitoring technologies like drones, AI-powered satellite surveillance, and automatic identification systems (AIS) to improve real-time tracking and response.

Details: This would help monitor vast maritime areas more effectively and reduce the manual workload of personnel, increasing efficiency in both security and rescue operations.

Enhanced Interagency Collaboration and International Cooperation

1. Joint Task Forces for Maritime Security

Objective: Establish or strengthen joint task forces that include the Coast Guard, military forces,

environmental agencies, and international organizations to combat maritime threats such as piracy, trafficking, and illegal fishing

Details: Interagency collaboration can improve response times, resource-sharing, and the coordination of large-scale operations. This can be especially important for cross-border threats like piracy and drug trafficking.

2. Regional Maritime Cooperation Agreements

Objective: Develop multilateral agreements between countries for shared maritime patrols and coordinated response mechanisms in contested or high-traffic areas.

Details: This would allow Coast Guards to collaborate on patrolling maritime borders and responding to incidents in international waters more effectively.

Enhanced Training and Mental Health Support for Personnel

1. Comprehensive Training & Simulation Centers

Objective: Develop advanced training programs and simulation centers for Coast Guard personnel to practice operations under various scenarios, including extreme weather, international crises, or combat situations.

Details: Training would cover both technical skills and soft skills, including crisis management, interagency cooperation, and conflict resolution.

2. Mental Health and Resilience Initiatives

Objective: Implement mental health programs that focus on the well-being of Coast Guard personnel. This includes regular counseling, stress management programs, and mandatory rest periods during long missions.

Details: Programs should focus on stress reduction, preventing burnout, and ensuring personnel are mentally prepared to handle intense and high-pressure missions.

Efficient Resource Allocation

1. National and International Funding Mechanisms

Objective: Create dedicated funding programs for the procurement and maintenance of Coast Guard equipment, ensuring that operational capabilities are not hindered by financial constraints.

Details: These programs could be funded through national defense budgets, private-public partnerships, or international maritime security funds. They would focus on equipment upgrades, human resource development, and infrastructural improvements.

2. Cross-Border Funding for Collaborative Projects

Objective: Develop a collaborative funding model for regional maritime security initiatives that includes contributions from multiple countries. This can be used to fund joint patrols, shared infrastructure (like command centers), and collective training efforts.

Details: Multi-nation funding pools can be set up to reduce individual country burdens while fostering a unified approach to maritime security.

From these programs, the respondents have indicated their answers using the same 5-Point Likert Scale Matrix, wherein:

Likert Rating	Interpretation
5	Strongly Agreeing to the attributed presented
4	Moderately Agreeing to the attributed presented
3	Neutral or Undecided
2	Moderately Disagreeing to the attributed presented
1	Strongly Disagreeing to the attributed presented

PERCEIVED PROGRAMS FOR IMPROVEMENT	RATING
The Philippine Coast Guard is active in modernization efforts to enhance its maritime safety, security, and law enforcement capabilities	4.50
The Philippine Coast Guard is dedicated towards training and professional development of its personnel to better respond to maritime challenges	4.20
The Philippine Coast Guard is committed to adopt strategies to strengthen inter-agency and international cooperation in addressing maritime threats and emergencies	5.00
The Philippine Coast Guard persistently enhances its use of technology to improve surveillance and rescue operations	5.00
The Philippine Coast Guard constantly engages in policies or legislative reforms that secure more resources and funding to support its operations and infrastructure development	5.00
AGREEGATE MEAN RATING	4.7

The results are very high and trusting. The respondents are optimistic that every program that they deem would help PCG are also the ones that are currently implemented and is very dedicated to achieve desired results in order to improve.

Statistical Analysis

Using One-Way Anova, to determine the variances of their responses based from the above-mentioned rating scales, the following answers were determined.

Overall Mean	4.45
F-Value (Percentage Difference across the responses, the lower, the better)	0.1759 (17.59%)
P-Value (the probability that the responses are credible and consistent, in statistical terms, if the result is lower than 0.90 or 90%, it is generally considered to be of no significant difference, ergo, the answers are practically similar)	0.8510 (85.10%)

The answers reveal that the respondents experience the same within and across their tasks and duties. Hence, their answers are credible.

SUMMARY

Based from the respondents' answers, the following can be summed up and initiated:

1. The effective resolution of the challenges faced by Coast Guards requires a combination of technological innovation, collaborative international efforts, financial investments, and focused training.
2. Governments and agencies must prioritize modernizing their forces, improving interagency coordination, and investing in the mental and physical well-being of personnel to ensure Coast Guards can continue to protect maritime safety, security, and the environment.

After all, the Philippine Coast Guard has a large budget. All it needs is proper allocation.

Recommendation

Based from the responses, the following are recommended by the proponents to improve the Coast Guard:

1. Modernization of Fleet and Equipment

Acquiring New Vessels and Aircraft: Invest in more advanced and versatile vessels such as multi-role response vessels (MRRVs), offshore patrol vessels (OPVs), and fast attack craft. Additionally, acquiring helicopters and drones for surveillance and search and rescue operations is essential.

Enhancing Communication and Surveillance Systems: Invest in modern radar systems, satellite tracking, and automatic identification systems (AIS) for improved monitoring of maritime traffic and early detection of threats.

Strengthening Search and Rescue Equipment: Improve the availability of search and rescue boats, specialized equipment, and medical facilities for emergencies.

2. Training and Capacity Building

Professional Development: Regular training and international exchange programs for officers and crew can enhance expertise in various operations such as navigation, law enforcement, disaster response, and environmental protection.

Simulation and Scenario-Based Training: Implement training simulators for handling complex maritime emergencies, including piracy, oil spills, and natural disasters. This can prepare personnel for real-world situations in an efficient and cost-effective way.

3. Enhancing Maritime Law Enforcement Capabilities

Strengthening Border Security: Deploy additional personnel and resources to monitor and protect the country's maritime borders, especially in contested waters like the South China Sea.

Collaboration with Other Agencies: The PCG can benefit from closer coordination with the Philippine Navy, Bureau of Fisheries and Aquatic Resources, and the National Disaster Risk Reduction and Management Council. This can lead to more integrated and effective operations in law enforcement, disaster response, and resource management.

Building Partnerships with Regional and International Entities: Collaborate with other countries' coast guards and maritime agencies for joint exercises, intelligence sharing, and cooperative law enforcement to strengthen regional maritime security.

4. Upgrading Infrastructure

Expanding Port Facilities: Improve coastal infrastructure, including ports and docking facilities, to support the maintenance of a modernized fleet and ensure rapid deployment during emergencies.

Building More Coastal Stations: Strategically locate new PCG stations along the country's coasts to ensure faster response times and better coverage of territorial waters.

5. Adopting Technology and Innovation

Artificial Intelligence and Big Data: Integrate AI-powered systems for predictive analytics and decision-making to enhance real-time operational efficiency. Data analytics could optimize fleet deployment and help track suspicious activities.

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