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Website: https://etcor.org
iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577
The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

Evaluating the Philippine Coast Guard Station and Sub-Station Personnel's Capabilities During Marine Casualty Investigations (MCI): A Framework for a Standardized Training Program

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Received: 03 March 2025 **Revised**: 05 April 2025 **Accepted**: 07 April 2025

Available Online: 08 April 2025

Volume IV (2025), Issue 2, P-ISSN – 2984-7567; E-ISSN - 2945-3577

https://doi.org/10.63498/nxz2st261

Abstract
Aim: The immediate conduct of Marine Casualty Investigations (MCI) is crucial and should be handled by qualified investigators. However, there are instances when investigators are unduly delayed and have not yet arrived at the scene. In such cases, the responsibility of performing highly crucial and critical steps—including initial investigations, coordination with other agencies, data collection, identification of safety deficiencies, and submission of reports—falls on the Philippine Coast Guard (PCG) Station and Sub-station personnel. Properly conducting MCIs is essential to derive accurate results and formulate effective recommendations. It ensures that similar incidents are prevented in the future. This study is particularly relevant in identifying the capabilities, roles, and challenges faced by PCG Station and Sub-station personnel in supporting MCI.
Methodology: The study employed a concurrent triangulation mixed-method research design using checklists, test questionnaires, and interviews to gather both quantitative and qualitative data. The listed dependent variables include the personnel's roles, capabilities, and performance levels, while the enumerated independent variables—such as training, professional development, and targeted development programs—aim to enhance skills. The study involved 100 participants, comprising 10 PCG Station Commanders and 90 Sub-station Commanders.
Results: The findings reveal gaps in terms of gender balance and training. Most participants were senior male officers with law enforcement experience but lacked specialized MCI training. While PCG personnel demonstrated strong capabilities in identifying safety deficiencies, evidence collection, and initial investigations, weaknesses were observed in report drafting, inter-agency coordination, evidence handling, and managing media and unauthorized personnel during MCIs.
Conclusion: To address these gaps, improving the quality of training programs, fostering inter-agency collaboration, streamlining the reporting process, and implementing quality improvement plans are recommended. Long-term studies and comparative assessments, annual calibrations, and recalibrations should be conducted to strengthen the overall effectiveness and preparedness of MCI operations.

Keywords: *Philippine Coast Guard, Station and Sub-Station Personnel, Marine Casualty Investigations*

INTRODUCTION

On March 29, 2023, the MV Lady Mary Joy 3 caught fire near Baluk-Baluk Island in Basilan, resulting in the tragic loss of 28 lives. In an attempt to save more passengers, the captain grounded the vessel, but despite the crew's efforts, the fire claimed many lives. The Marine Casualty Investigation Team (MCIT) arrived several days later due to the remote location, but local Philippine Coast Guard (PCG) personnel responded immediately by conducting initial investigations, collecting evidence, and coordinating with other agencies. This swift response by first responders played a crucial role in preserving evidence and ensuring the accuracy of subsequent investigations.

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This incident underscores the vital role of PCG personnel in maritime casualty investigations, particularly given the Philippines' geographical layout as an archipelago. With over 7,600 islands and a heavy reliance on inter-island shipping, maritime incidents are common. Between 2016 and 2022, the Philippines recorded hundreds of maritime accidents, highlighting the need for effective response strategies. The study aims to assess the capabilities of PCG Station and Sub-station personnel in handling these incidents, identifying challenges, and establishing a foundation for better training programs to improve their effectiveness in responding to maritime casualties (Abad et al., 2023; Ferre, 2022).

By evaluating the roles and challenges faced by PCG personnel, the study sought to improve their capabilities and coordination in marine casualty investigations. The goal is to align with international maritime safety standards and strengthen overall maritime safety in the Philippines. Enhancing the training and response strategies of first responders will contribute to more accurate investigations and ultimately help protect lives and property at sea (Republic Act No. 9993, 2009).

Marine Casualty Investigations (MCI) in the Philippines are primarily conducted by two government agencies, MARINA and the Philippine Coast Guard (PCG), following international frameworks like the International Casualty Investigation Code and conventions such as UNCLOS, SOLAS, and MARPOL. These investigations aim to prevent future incidents and improve maritime safety, not to assign blame. While the Marine Casualty Investigator Team (MCIT) plays a central role, PCG Station and Sub-station personnel also significantly contribute by conducting initial investigations, gathering evidence, identifying safety deficiencies, and collaborating with other agencies. The PCG follows the Standard Operating Procedures 04-22 to guide their actions during MCIs, but challenges such as insufficient training, delayed response from the MCIT, inadequate resources, jurisdictional conflicts, and coordination issues hinder their effectiveness. This study identifies the gaps in the capabilities and challenges faced by Station and Sub-station personnel, aiming to enhance their ability to support MCIT and improve maritime safety (Abad et al., 2023; Republic Act No. 9993, 2009).

Objectives

This study determined the capabilities of the Philippines Coast Guard Station and Substation personnel in conducting Marine Casualty Investigations (MCI). Specifically, this research will answer the following questions;

1. What is the profile of the respondents in terms of:
    a. Age;
    b. Sex;
    c. Position;
    d. Years in service; and
    e. Number of MCI trainings attended?
2. How capable are the Philippine Coast Guard Station and Substation personnel in supporting the MCIT during Marine Casualty Investigations (MCI) in terms of:
    a. Initial Investigations;
    b. Collecting Evidence;
    c. Coordinating with other Agencies;
    d. Identifying Safety Deficiencies; and
    e. Submission of reports?
3. Is there a significant relationship between the Philippine Coast Guard Station and Substation personnel capability in Marine Casualty Investigations (MCI) when grouped according to profile?
4. What are the challenges of the Philippine Coast Guard Station and Substation personnel in conducting the Marine Casualty Investigations (MCI)?
5. What are the specific tasks in conducting the Marine Casualty Investigations (MCI) that should be performed by Station and Substation personnel?
6. Based on the findings, what Marine Casualty Investigations (MCI) Enhancement Training Program can be designed for Philippines Coast Guard Station and Substation personnel?

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Hypothesis

1. There is no significant relationship between Philippine Coast Guard Station and Substation personnel's capability in Marine Casualty Investigation (MCI) when group according to profile of the respondent in terms of:
   a. Age
   b. Sex
   c. Position
   d. Years in service
   e. Number of MCI trainings attended.

METHODS

Research Design

This study employed a concurrent triangulation mixed-method research design, integrating both quantitative and qualitative data collection to assess the roles, tasks, capabilities, and challenges faced by PCG Station and Sub-station personnel in supporting the MCIT during Marine Casualty Investigations (MCI). Quantitative data were gathered through checklists and test questionnaires focused on key areas such as conducting initial investigations, coordinating with other agencies, evidence collection, identifying safety deficiencies, and submitting MCI reports. Qualitative data were obtained through interviews to explore the challenges faced by the personnel. Document analysis of PCG's Standard Operating Procedures (SOP) 04-22 was also used to understand the specific tasks performed by these personnel.

Population and Sampling

A total of 100 PCG personnel participated in the study, including Station and Sub-station Commanders and officers or non-officers with at least two years of service and direct or indirect involvement in MCI or maritime operations. The study also included three PCG-trained marine casualty investigators to increase the validity of the findings. The respondents were selected to provide insights into the capabilities and roles of PCG personnel in supporting the MCIT during MCI, ensuring the study's relevance and significance.

Instruments

The study utilized a checklist, test questionnaire, and interview questionnaire designed to address the research objectives. The test questionnaire, based on PCG's SOP 04-22, assessed the capabilities of PCG personnel in key areas such as initial investigations, evidence collection, coordination with agencies, and MCI report submissions. The checklist gathered demographic data, while the interview questionnaire sought to delve deeper into the challenges faced by the personnel. A Google Survey form was used for easier data collection from respondents across the Philippines. The research instruments (checklist, test questionnaire, and interview questionnaire) were validated by an adviser, researchers, statistician, and a panel for accuracy and reliability. The instruments underwent a pilot test with 10 participants, and reliability was assessed using the split-half method within the SPSS software, achieving a satisfactory result before proceeding with the study.

Data Gathering Procedures

The data collection process included distributing questionnaires and conducting interviews. After obtaining permission from relevant offices, the researcher provided consent forms and distributed the surveys online. The questionnaires were collected after one week, and the data were checked for validity using SPSS. Random interviews were also conducted to enrich the study's findings.

Data Analysis

Data analysis involved transforming raw data into a tabulated format for easier interpretation, using tools such as the Mean, Mean percentage scores, and Frequency analysis to summarize and categorize the responses. SPSS was used to analyze relationships between variables, while thematic analysis was applied to interview data to identify patterns and challenges faced by PCG personnel. Document analysis of PCG SOP 04-22 provided further context to the specific tasks performed by personnel during MCI.

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Ethical Considerations

The researcher ensured that ethical guidelines were followed, with participants providing informed consent and being aware of their rights, including confidentiality and the option to withdraw at any time. All sources were properly cited, and the study was checked for originality using plagiarism detection tools. Personal information was kept confidential, and the data was securely handled, accessible only to authorized personnel.

RESULTS and DISCUSSION

Profile of the Respondents

The study revealed key findings on the profiles of PCG Station and Sub-station personnel, focusing on their age, sex, position, years of service, and MCI training. The majority of respondents were over 40 years old (42%), followed by those in the 36–40 age group (36%), indicating a workforce with substantial experience, aligning with trends of leadership roles being held by older individuals (Alberto, 2019; Monzales et al., 2020). The study also highlighted a significant gender imbalance, as all participants were male, reflecting the historical male dominance in maritime and military sectors (Armando, 2019; Remedios, 2019; Stannard & Dimayacyac, 2019). In terms of position, most respondents were Sub-station Commanders (90%), emphasizing the decentralized nature of the PCG's operations. Regarding experience, 78% had over 10 years of service, which is crucial for the effective performance of MCI-related tasks. However, there was a notable lack of formal MCI training, with 79% of participants reporting no MCI training, highlighting a gap in preparedness and training for conducting thorough MCI investigations. This gap underscores the need for more specialized MCI training to enhance the competency and effectiveness of PCG personnel in their supporting roles during MCI.

Capabilities of Philippine Coast Guard Station and Sub-Station Personnel in the Conduct of Marine Casualty Investigations (MCI)

The study assessed the capabilities of Philippine Coast Guard (PCG) Station and Sub-Station personnel in supporting Marine Casualty Investigations (MCI) across several key areas, including conducting initial investigations, coordinating with other agencies, gathering evidence, identifying safety deficiencies, and submitting reports. Results revealed high proficiency, with most personnel scoring "Very Good" or "Excellent" in initial investigations (mean score: 90.56%) and evidence collection (mean score: 92.50%). However, coordination with other agencies was weaker, with a "Satisfactory" mean score of 83%, highlighting a need for improvement in conflict resolution and communication skills. Identifying safety deficiencies also yielded strong performance (mean score: 90.46%), while report submission was the area with the most significant challenges, with many personnel scoring "Basic" or "Satisfactory." Specific weaknesses included data analysis, report writing skills, and meeting deadlines. The study also identified that factors such as age, education, and experience influence performance, suggesting that targeted training and professional development could address gaps in these critical areas.

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Significant Relationship between the Capability of Philippine Coast Guard Station and Sub-Station Personnel in Marine Casualty Investigations (MCI) when grouped according to Profile

Table 1.
Significant Relationship Between Philippine Coast Guard Station and Sub-station Personnel Capability in Marine Casualty Investigations (MCI) When Grouped According to Profile

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	88.830	6.645		13.765	.000
age	3.70	1.82	.176	2.204	.000
Sex	.385	0.43	.677	8.667	.000
Position	.118	.034	.252	3.767	.000
Years in service	.118	0.32	.342	3.764	.000
Number of MCI trainings attended	11.233	1.433	.748	8.987	.000

According to Table 1, as interpreted, the predictor age has a coefficient of 3.70, a standard error of 1.82, and a t-value of 2.204, yielding a significant p-value of .000. This means that the dependent variable increases by 3.70 units for every additional year of age, assuming all other variables are held constant. The standardized coefficient of .176 suggests a very slight positive impact compared with others.

The coefficient for Sex is .385, with a standard error of 0.43 and a t-value of 8.667, which results in a p-value of .000. This indicates that males have a value that is 0.385 units higher on the dependent variable. Additionally, the standardized coefficient of .677 indicates a strong positive effect of Sex on the dependent variable.

The position coefficient is 0.118 with a standard error of 0.034 and a t-value of 3.767, which gives a significant p-value of 0.000. For every unit increase in position, all else being equal, the dependent variable increases by 0.118 units. The standardized coefficient of 0.252 suggests that the effect of position on the dependent variable is modest and positive.

The variable years in service has a coefficient of 0.118, a standard error of 0.32, and a t-value of 3.764, resulting in a significant p-value of 0.000. This signifies that for each additional year of service, the dependent variable increases by 0.118 units, provided all other variables are held constant. The standardized coefficient of 0.342 indicates a slight positive effect of years of service on the dependent variable.

The number of MCI training attended shows a coefficient of 11.233, a standard error of 1.433, and a t-value of 8.987, yielding a highly significant p-value of 0.000. For each additional MCI training attended, the dependent variable increases by 11.233 units, provided all other variables remain constant. The standardized coefficient (0.748) signifies a strong positive effect of the number of MCI training attended on the dependent variable.

Hence, all the variables—age, sex, position, years of service, and the number of MCI training attended—significantly contribute to predicting the capability of PCG Station and Sub-station personnel in Marine Casualty Investigations. Notably, MCI training attended has the strongest effect, followed by sex.

Challenges of Philippine Coast Guard Station and Substation Personnel in the performance of their supporting roles in conducting Marine Casualty Investigations (MCI)

This study examines the challenges faced by Philippine Coast Guard (PCG) personnel during Marine Casualty Investigations (MCI), highlighting several key issues. A major concern is the lack of experience and training, with many personnel not having encountered MCI incidents, which hampers their ability to apply theoretical knowledge effectively in real-world scenarios. Documentation and reporting also present significant challenges, as many personnel struggle with adhering to standardized formats and ensuring accuracy, which can delay or impair investigation processes. Additionally, there are concerns about the thoroughness of investigations, with some

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participants emphasizing the need for more systematic and comprehensive procedures. Legal and procedural issues, such as filing cases and adhering to complex legal requirements, further complicate the process. Cooperation with other agencies, including sharing evidence, is another challenge that slows down investigations.

Furthermore, operational limitations such as budget constraints, uncooperative witnesses, and tight timelines exacerbate the difficulties faced by MCI investigators. The lack of familiarity with the International Maritime Organization's (IMO) Casualty Investigation Code, outdated regulations, and organizational barriers, including rank-related issues, also hinder effective investigations. These findings underscore the need for improved training, better inter-agency coordination, updated protocols, and a review of the current standard operating procedures to enhance the overall efficiency and effectiveness of MCI within the PCG. By addressing these gaps, the study suggests that the PCG can improve its investigative capabilities and maritime safety outcomes.

Specific Tasks to be performed by Station and Substation Personnel in Conducting Marine Casualty Investigations (MCI)

Station and Sub-station personnel in the Philippine Coast Guard (PCG) have a critical role in Marine Casualty Investigations (MCI), assisting with tasks such as evidence collection, documenting incident details, and providing testimony or witness statements. They are responsible for maintaining the chain of custody of evidence, conducting interviews, and offering technical support when specialized expertise is required. Additionally, these personnel review investigation reports and participate in peer reviews to ensure the accuracy and integrity of the findings. Their involvement is essential for creating a comprehensive understanding of the incident, from collecting physical evidence and witness accounts to analyzing technical data and ensuring the proper handling of evidence, all of which contribute to enhancing the investigation process and improving maritime safety.

Proposed Enhancement Training Program Designed for PCG MCI

The proposed enhancement training program for the Philippine Coast Guard (PCG) aims to address the gaps in skills and knowledge among Station and Sub-station personnel, particularly Commanders, in conducting Marine Casualty Investigations (MCI). The program focuses on developing technical competencies in areas such as evidence collection, documentation, reporting, inter-agency coordination, and legal compliance. The course will be structured around practical simulations, case studies, and workshops, with a strong emphasis on improving decision-making, communication, and investigation techniques. Additionally, participants will gain skills in handling external influences, managing risk assessments, and ensuring proper report writing. The program is designed to be highly interactive, incorporating cross-training, peer reviews, and mock exercises to enhance real-world application.

The training will be offered twice a year and is open to PCG personnel with at least one year of experience in vessel safety enforcement and certain rank qualifications. Participants will undergo continuous evaluation through written exams, practical exercises, and performance assessments to ensure that they are meeting the learning objectives. Successful completion of the course will result in a certificate of participation, while a certificate of merit will be awarded to top performers. An ongoing evaluation process will ensure the program remains effective and aligned with the evolving needs of PCG personnel.

Conclusions

The study reveals significant challenges faced by Philippine Coast Guard (PCG) Station and Sub-station personnel in Marine Casualty Investigations (MCI), including gender disparities, inadequate training, and gaps in experience. While personnel excelled in tasks such as evidence collection and identifying safety deficiencies, issues such as poor coordination with other agencies and difficulties in documentation and report writing were prominent. Legal and procedural challenges, such as complex legal requirements and inter-agency cooperation issues, further complicate MCI operations. Despite these hurdles, the active involvement of personnel in critical MCI tasks has contributed to improving transparency, accountability, and maritime safety, though targeted training and better inter-agency collaboration are necessary for further enhancement.

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Recommendations

To improve the effectiveness of PCG Station and Sub-station personnel in MCI, the study suggests implementing an enhancement training program covering areas like media relations, inter-agency coordination, evidence preservation, and report writing. Additionally, MCI training should become a requirement for aspiring Commanders to ensure effective leadership. The establishment of a dedicated PCG unit for MCI prosecution is recommended to enhance accountability, alongside strengthening quality control mechanisms through regular performance evaluations and feedback. Lastly, future research should focus on the long-term impact of MCI training, coordination improvements, and the integration of international standards into the investigation process.

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