HASIL TURNITIN - REVISI - JURNAL PAK ASUR.

by Pustaka Publisher

Submission date: 05-Apr-2025 11:25AM (UTC-0500)
Submission ID: 2635930630
File name: REVISI_-_JURNAL_PAK_ASUR.docx (4.7M)
Word count: 5707
Character count: 35852

Jurnal Cakrawala Akademika (JCA)
Vol. 1 No. 3 Oktober 2024
E-ISSN: 3062-9942 , Hal 00-00
DOI: https://doi.org/10.70182/JCA
https://jurnalpustakacendekia.com/index.php/jca

Implementation of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPS) to Improve Work Safety on Tanker Ships: a Case Study on MT FTM 24

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Abstract. *This study investigates the implementation of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs) aboard the MT FTM 24, a tanker vessel operating under international maritime regulations. The research aims to analyze the effectiveness of SOPs in improving work safety, identify challenges in their application, and provide recommendations for enhancing safety practices. Using a qualitative case study approach, data were collected through interviews, direct observations, and document analysis. The findings reveal that while SOPs are formally in place and compliant with standards such as the ISM Code and SOLAS, gaps remain in practical execution—particularly in training consistency, crew engagement, and behavioural safety integration. Crew understanding of SOPs varied based on rank, language proficiency, and operational experience. The study concludes that while SOPs contribute significantly to risk mitigation, their success depends on leadership support, continuous training, and a proactive safety culture. Recommendations include improving SOP accessibility, enhancing multilingual training, and establishing feedback mechanisms to support continuous procedural improvement. This research offers practical insights for shipping companies and contributes to the broader discourse on maritime occupational safety.*

Keywords: *Maritime Safety, Occupational Health and Safety (OHS), Safety Management System (SMS), Standard Operating Procedures (SOPs), Tanker Vessel*

Abstrak. Penelitian ini menyelidiki penerapan Prosedur Operasi Standar (SOP) Keselamatan dan Kesehatan Kerja (K3) di atas kapal MT FTM 24, sebuah kapal tanker yang beroperasi di bawah peraturan maritim internasional. Penelitian ini bertujuan untuk

Received Desember 30, 2022; Revised April 30, 2023; Accepted Agustus 30, 2023
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menganalisis efektivitas SOP dalam meningkatkan keselamatan kerja, mengidentifikasi tantangan dalam penerapannya, dan memberikan rekomendasi untuk meningkatkan praktik keselamatan kerja. Dengan menggunakan pendekatan studi kasus kualitatif, data dikumpulkan melalui wawancara, observasi langsung, dan analisis dokumen. Temuan menunjukkan bahwa meskipun SOP secara formal sudah ada dan sesuai dengan standar seperti ISM Code dan SOLAS, masih ada kesenjangan dalam pelaksanaan praktisnya - terutama dalam hal konsistensi pelatihan, keterlibatan awak kapal, dan integrasi perilaku keselamatan. Pemahaman awak kapal terhadap SOP bervariasi berdasarkan pangkat, kemampuan bahasa, dan pengalaman operasional. Studi ini menyimpulkan bahwa meskipun SOP berkontribusi secara signifikan terhadap mitigasi risiko, keberhasilannya bergantung pada dukungan kepemimpinan, pelatihan berkelanjutan, dan budaya keselamatan yang proaktif. Rekomendasi yang diberikan meliputi peningkatan aksesibilitas SOP, peningkatan pelatihan multibahasa, dan membangun mekanisme umpan balik untuk mendukung peningkatan prosedur yang berkelanjutan. Penelitian ini menawarkan wawasan praktis bagi perusahaan pelayaran dan berkontribusi pada wacana yang lebih luas tentang keselamatan kerja maritim.

Kata Kunci: Keselamatan Maritim, Keselamatan dan Kesehatan Kerja (K3), Sistem Manajemen Keselamatan, Prosedur Operasi Standar, Kapal Tanker

INTRODUCTION

Maritime safety is a critical concern in the shipping industry, aiming to protect lives, property, and the marine environment. Neglecting maritime safety can lead to catastrophic incidents, such as oil spills and vessel collisions, underscoring the dire consequences of inadequate safety measures. To enhance safety at sea, the International Maritime Organization (IMO) has developed international regulations, including the International Safety Management (ISM) Code, which became mandatory for tankers in 1998. The ISM Code imposes strict standards on shipping companies to ensure the safe management and operation of ships.

Occupational Health and Safety (OHS) plays a pivotal role in maritime safety, particularly in tanker operations. The unique challenges and risks associated with maritime work necessitate specialized OHS measures to ensure the safety and efficiency of operations. Effective implementation of OHS protocols is essential to mitigate potential hazards and protect crew members from occupational risks.

A robust safety culture is fundamental to the successful implementation of OHS practices in the maritime industry. This culture encompasses the skills to manage safety

risks in operations and ensures that employees are adequately trained in proactive safety risk management. Integrating human, organizational, and technological factors is crucial for a holistic approach to safety. By fostering a strong safety culture, shipping companies can enhance their safety management systems, leading to improved safety outcomes and compliance with international standards.

Ensuring work safety on tanker vessels remains a complex task due to the inherently high-risk environment associated with maritime operations. Tanker ships, which often carry flammable and hazardous cargo such as oil, gas, or chemicals, are particularly vulnerable to fire, explosion, toxic exposure, and environmental contamination. According to **Zhang et al. (2021)**, one of the main challenges is the presence of volatile substances, which increases the risk of occupational accidents and requires rigorous adherence to safety protocols and protective equipment use.

Another significant challenge is the **human factor**, which continues to be a leading cause of maritime accidents. **Karvonen and Salokannel (2022)** note that fatigue, miscommunication, and insufficient training contribute to unsafe behaviors and decision-making on board. Crewmembers often work long hours under stressful and isolated conditions, which can impair judgment and responsiveness in emergency situations.

Additionally, the **complexity of international safety regulations** poses difficulties in uniform implementation. Ships operating under different flags and jurisdictions often face inconsistencies in safety standards and inspection procedures. As highlighted by **Dimitriou and Theotokatos (2020)**, compliance with multiple regulations—such as SOLAS, MARPOL, and the ISM Code—requires constant updates to onboard procedures, which can overwhelm crew members if not properly managed through continuous training and support.

Technological limitations also present a challenge, especially on older vessels that lack modern safety systems and automation. As per **Lee and Park (2023)**, while newer ships are increasingly equipped with real-time monitoring and safety management systems, many older tanker vessels are still dependent on manual processes, which are more prone to human error and mechanical failure.

Furthermore, **communication barriers** between multinational crew members can lead to misunderstandings during critical operations. Safety drills and instructions may not always be effectively understood, leading to improper responses during actual

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emergencies. This concern is emphasized in the work of **Nguyen et al. (2024)**, who argue that language diversity, when not addressed through standardized communication protocols, becomes a latent safety risk.

In conclusion, the challenges in ensuring work safety on tanker vessels are multifaceted, encompassing hazardous cargo handling, human limitations, regulatory complexity, outdated technology, and communication issues. Addressing these challenges requires a holistic safety management approach involving continuous training, investment in modern safety infrastructure, and fostering a strong safety culture across all levels of maritime operations.

Standard Operating Procedures (SOPs) serve as essential tools in mitigating occupational hazards, particularly in high-risk environments such as tanker vessels. SOPs provide structured and standardized instructions for routine and emergency operations, ensuring that all crew members perform tasks safely and consistently. According to **Rahman and Chowdhury (2021)**, SOPs function as a critical component in reducing human error, which is a leading cause of accidents in maritime operations. By outlining clear steps for hazardous tasks, SOPs help prevent unsafe actions and reinforce proper use of personal protective equipment (PPE).

SOPs also play a vital role in promoting a **culture of safety compliance**. As discussed by **Fernandez and Liu (2023)**, consistent implementation of SOPs fosters discipline and accountability among crew members. They serve not only as a guide but also as a reference for evaluation and auditing, which is crucial for maintaining high safety standards. In the context of tanker ships, where operations often involve the handling of flammable liquids and pressurized systems, deviations from SOPs can lead to catastrophic outcomes such as explosions or environmental spills.

Moreover, SOPs contribute significantly to **emergency preparedness**. **Singh et al. (2022)** emphasize that well-established SOPs for fire outbreaks, chemical leaks, or man-overboard incidents enable faster, more coordinated responses. Regular drills based on these SOPs improve crew readiness and reduce the potential for confusion during actual emergencies.

A further benefit of SOPs lies in their role in **training and onboarding** new personnel. For new seafarers joining a vessel, SOPs offer a reliable framework to understand procedures and adapt to the safety culture on board. **Jafari and Chen (2020)**

argue that when integrated with simulation-based training, SOPs can significantly enhance safety awareness and procedural accuracy.

However, SOPs are only effective if they are kept up-to-date, relevant, and adapted to real operational conditions. Outdated or generic SOPs can cause complacency or confusion. As highlighted by **Okeke and Tan (2024)**, periodic reviews, crew feedback, and technological updates are necessary to ensure that SOPs remain effective in mitigating contemporary risks.

MT FTM 24 is a medium-sized product tanker vessel designed for the transportation of refined petroleum products, chemicals, or other liquid cargoes classified as hazardous. The vessel operates under national and international maritime regulations, including those set by the International Maritime Organization (IMO), and is equipped with basic safety systems, firefighting apparatus, and pollution prevention tools in accordance with MARPOL and SOLAS standards. With a crew comprising officers, engineers, and ratings of diverse nationalities, the vessel reflects a typical operational structure found on similar tanker vessels.

MT FTM 24 has been selected as the subject of this case study due to its representativeness in operational procedures, safety practices, and risk exposure levels within the tanker shipping industry. The vessel conducts regular domestic and regional voyages, often operating in congested port areas and high-traffic maritime routes. These conditions increase the likelihood of occupational risks, making it a suitable platform to analyze the real-world application of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs).

Furthermore, MT FTM 24 recently underwent an internal audit and safety inspection that highlighted several strengths and gaps in the implementation of its OHS SOPs. These findings provide a valuable opportunity to assess how well SOPs are understood, followed, and integrated into daily operations. According to **Ismail and Ridwan (2023)**, studying SOP implementation on active tanker vessels like MT FTM 24 can yield insights into the practical challenges and behavioral factors affecting maritime safety performance.

The vessel's mixed crew composition also presents an important dimension in analyzing communication efficiency, procedural discipline, and the influence of multicultural factors on safety culture. As such, MT FTM 24 serves as a relevant and

realistic case study to evaluate how SOPs mitigate occupational hazards and promote safety in the dynamic and high-risk context of tanker vessel operations.

The primary objective of this research is to analyze the implementation of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs) on board the MT FTM 24, a tanker vessel operating under international maritime regulations. This study seeks to examine how SOPs are integrated into the vessel's daily operations, crew routines, and safety protocols. A key focus is placed on assessing the extent to which these procedures are adhered to, understood by the crew, and aligned with regulatory safety standards.

In addition, this research aims to evaluate the effectiveness of these SOPs in enhancing work safety on board. This includes investigating their impact on reducing the incidence of work-related accidents, promoting hazard awareness, and improving response times during emergency situations. By examining safety records, crew feedback, and operational practices, the study will provide insights into how SOPs contribute to a safer working environment at sea.

Lastly, the research intends to identify the major challenges and barriers encountered in the application of OHS SOPs, along with potential areas for improvement. This involves exploring factors such as communication gaps, training adequacy, cultural diversity, and procedural clarity that may hinder optimal implementation. The findings are expected to inform practical recommendations for strengthening SOP enforcement and promoting a more robust safety culture on tanker vessels like MT FTM 24.

This research holds significant value in contributing to the improvement of safety management systems within the maritime industry, particularly in the context of tanker vessel operations. By focusing on the implementation of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs) aboard MT FTM 24, the study provides evidence-based analysis that can inform both policy development and operational best practices. The findings aim to support maritime regulators and industry stakeholders in enhancing procedural compliance and risk mitigation strategies.

Furthermore, the study offers practical insights for shipping companies regarding the real-world challenges and successes involved in the enforcement of OHS SOPs. These insights can assist in refining training programs, updating safety documentation, and strengthening onboard monitoring systems to achieve higher safety standards. By

examining the lived experiences and perspectives of crew members, the research captures the operational realities that influence the effectiveness of SOP implementation.

Lastly, this study enhances the broader understanding of safety culture on tanker vessels by exploring the behavioral, organizational, and contextual factors that shape safety-related practices. In doing so, it contributes to ongoing discussions about how to foster a proactive and sustainable safety culture at sea. The outcomes of this research are expected to benefit not only MT FTM 24 but also serve as a valuable reference for similar tanker operations across the global maritime sector.

LITERATURE REVIEW

Occupational Health and Safety (OHS): Definition and Principles

Occupational Health and Safety (OHS) refers to the policies, procedures, and practices that aim to prevent work-related injuries, illnesses, and fatalities. In high-risk industries such as maritime shipping, OHS plays a critical role in protecting seafarers from physical, chemical, ergonomic, and psychological hazards. According to **Jafari and Chen (2020)**, effective OHS systems are grounded in principles such as hazard identification, risk assessment, worker participation, continuous training, and the promotion of a safety-oriented culture. These principles ensure that safety becomes an integral part of daily operations rather than a reactive response to incidents.

The Role of SOPs in Risk Prevention and Emergency Preparedness

Standard Operating Procedures (SOPs) serve as structured guidelines for carrying out tasks safely and efficiently. In maritime operations, SOPs are especially important for high-risk tasks such as cargo handling, confined space entry, and emergency responses. **Rahman and Chowdhury (2021)** emphasize that SOPs reduce the likelihood of human error by standardizing procedures and clarifying crew responsibilities. Moreover, SOPs support emergency preparedness by ensuring that crew members know exactly how to respond to scenarios such as fire outbreaks, oil spills, or man-overboard incidents. Routine drills and periodic reviews of SOPs are essential in maintaining readiness and responsiveness during actual emergencies.

Previous Studies on Maritime Safety and SOP Effectiveness

Several studies have highlighted the link between SOP implementation and improved safety outcomes in the maritime industry. **Karvonen and Salokannel (2022)** found that vessels with strong SOP adherence reported fewer occupational incidents and

greater crew confidence during emergency situations. Similarly, **Nguyen et al. (2024)** demonstrated that multilingual SOP training significantly improved procedural compliance in multicultural crews. Despite these findings, many studies also report persistent challenges such as SOP fatigue, procedural shortcuts, and lack of contextual adaptation, all of which can undermine safety efforts if not addressed through regular training and crew engagement.

Regulatory Framework: IMO, ISM Code, and National Maritime Safety Laws

The international maritime regulatory framework provides the foundation for implementing OHS practices and SOPs at sea. The **International Maritime Organization (IMO)** plays a central role in developing safety conventions such as SOLAS (Safety of Life at Sea), MARPOL (Marine Pollution), and the **International Safety Management (ISM) Code**, which mandates that shipping companies establish safety management systems, including SOPs, emergency plans, and training protocols. As outlined by **Dimitriou and Theotokatos (2020)**, the ISM Code requires clear lines of accountability and procedures for all shipboard operations. Additionally, many countries implement national maritime laws and flag-state regulations that further reinforce the adoption of OHS standards on vessels operating under their jurisdiction. Compliance with both international and national frameworks is essential to ensuring consistent safety practices across the global maritime sector.

RESEARCH METHODOLOGY

This study adopts a **qualitative case study approach** to explore the implementation and effectiveness of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs) aboard the MT FTM 24. The qualitative method is suitable for capturing in-depth insights into real-life practices, perceptions, and challenges faced by personnel involved in safety operations on tanker vessels. By focusing on a single vessel as a case, the research aims to provide a contextualized understanding of how OHS SOPs are applied and experienced in the maritime environment.

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Data collection was carried out using multiple techniques to ensure triangulation and enhance the validity of the findings. First, **semi-structured interviews** were conducted with key informants, including crew members, safety officers, and vessel management staff. These interviews explored topics such as daily safety routines, familiarity with SOPs, training experiences, and challenges in compliance. Second, **direct**

observations of onboard activities were conducted to examine how SOPs were followed in practice, especially during safety drills, cargo operations, and maintenance work. Third, relevant **documents**—including safety manuals, SOP logs, internal audit reports, and incident records—were analyzed to complement the primary data and provide a procedural framework for the vessel's safety management practices.

The research involved **purposefully selected participants** representing various ranks and roles on MT FTM 24. This included officers, engineers, ratings, and designated safety personnel to ensure a comprehensive perspective on SOP implementation and safety culture.

For **data analysis**, a **thematic analysis** approach was employed. Interview transcripts, observation notes, and document excerpts were systematically coded and categorized into emerging themes related to SOP implementation, safety behavior, communication, and procedural challenges. The qualitative data were then interpreted to identify patterns, relationships, and areas for improvement in the safety management system.

This methodological framework enables a rich and nuanced understanding of how OHS SOPs function in a real-world tanker vessel setting and offers actionable insights for enhancing maritime occupational safety.

RESULTS AND DISCUSSION

Current Implementation Status of OHS SOPs on MT FTM 24

The findings of this study indicate that the implementation of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs) on MT FTM 24 is partially effective, with certain strengths and noticeable gaps. Based on interviews and field observations, it was found that the vessel has a documented set of SOPs aligned with international maritime safety regulations such as the ISM Code and SOLAS. These SOPs cover critical operations including cargo handling, confined space entry, fire safety, and emergency response procedures. Most crew members, particularly officers and safety officers, demonstrated awareness of the existence of these SOPs and their importance in maintaining a safe working environment.

Routine safety drills—such as abandon ship, fire, and oil spill containment drills—were conducted according to schedule, and these were documented and monitored as part of the vessel's Safety Management System (SMS). However, the level of

engagement during these drills varied. While officers performed tasks in line with SOP guidelines, several junior crew members were observed to follow instructions without fully understanding the underlying procedures or risks involved.

In terms of documentation, safety records and SOP checklists were available and regularly updated, but some procedural updates were delayed in dissemination to the entire crew. Interviews revealed that while most officers received formal training on SOPs, some ratings and engine room personnel reported relying more on peer instruction or on-the-job learning, rather than structured SOP-based training. This gap suggests inconsistency in knowledge transfer, especially among multicultural crew members with varying language proficiencies.

Another key finding was the strong dependence on leadership and rank. Safety culture on board was largely compliance-driven rather than intrinsically proactive. Many crew members admitted they followed SOPs more diligently during inspections or when supervised by senior officers. This indicates that while SOPs are formally in place and recognized, their implementation is not yet fully embedded in daily operational culture.

In summary, MT FTM 24 demonstrates formal compliance with OHS SOP requirements, but the practical application reveals gaps in training dissemination, behavioral consistency, and safety ownership at all crew levels. These findings align with prior research by **Karvonen and Salokannel (2022)**, who argued that the existence of SOPs alone is insufficient without effective training, leadership, and reinforcement of safety behavior through active engagement.

Key Findings on Safety Practices, Compliance, and Crew Awareness

The investigation into safety practices on board MT FTM 24 revealed a mixed level of compliance with OHS SOPs among crew members. While senior officers and engineers demonstrated a high level of procedural discipline, junior crew members, particularly ratings and new recruits, exhibited only partial understanding and inconsistent application of safety protocols. This discrepancy highlights a gap in knowledge transfer and a reliance on informal learning rather than structured, SOP-based training.

Interview data showed that most officers regularly participate in safety briefings and pre-work risk assessments, which are documented as part of the vessel's safety management system. These officers expressed confidence in the SOPs' clarity and

usefulness, especially for high-risk operations. However, several ratings reported that while they follow instructions given during operations, they are not always aware of the full procedures or the rationale behind them. This indicates that procedural compliance may sometimes be superficial or based on task repetition, rather than grounded in a full understanding of risk prevention.

Additionally, while safety drills (e.g., fire, oil spill, abandon ship) are conducted regularly, some crew members reported that the drills feel routine and are not always taken seriously, particularly when not directly supervised by management. As noted by **Fernandez and Liu (2023)**, a compliance-oriented safety culture—without corresponding internalization of safety values—can lead to procedural fatigue and reduced situational awareness.

Language diversity also emerged as a factor affecting crew awareness. Although SOPs are available in English, which is the working language on board, comprehension among non-native speakers was found to be inconsistent. Miscommunication during critical operations could increase the risk of unsafe acts, especially when real-time decisions are required. This is supported by findings from **Nguyen et al. (2024)**, who emphasized the importance of multilingual training tools and simplified safety communication on vessels with multinational crews.

In conclusion, while MT FTM 24 maintains formal compliance with OHS SOPs and has a structured system for enforcing safety practices, the actual level of awareness and behavioral consistency among crew members varies. Strengthening onboarding training, enhancing crew engagement during drills, and improving communication strategies could significantly improve the practical effectiveness of SOPs and foster a more proactive safety culture on board.

Analysis of Gaps and Inconsistencies in SOP Application

The analysis of data collected from MT FTM 24 reveals several critical gaps and inconsistencies in the application of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs). While formal procedures exist and are documented according to international standards, their practical implementation across departments and crew levels is uneven. This disconnect suggests a need for more active operational alignment and behavioral integration of SOPs into daily routines.

One of the most significant gaps identified is the **inconsistency in SOP understanding and execution among crew members**. While officers are generally familiar with the procedural steps and the reasoning behind them, many ratings tend to perform tasks based on habit or verbal instruction, without consulting the written SOPs. As noted by **Jafari and Chen (2020)**, such informal practices often emerge in repetitive tasks and can lead to deviations from standardized procedures—particularly under time pressure or in the absence of supervision.

Another notable inconsistency lies in the **update and communication of revised SOPs**. Although the vessel's Safety Management System includes provisions for regular revision and dissemination, some crew members were unaware of recent updates or changes in procedures. This is particularly concerning in high-risk operations such as bunkering, enclosed space entry, and engine room maintenance. According to **Okeke and Tan (2024)**, lapses in procedural communication are a common weakness in maritime safety systems and can directly compromise the effectiveness of risk mitigation.

Training delivery methods also emerged as a weakness. While initial familiarization with SOPs is part of the onboarding process, ongoing training tends to be informal and lacks structured follow-up. This leads to variability in how SOPs are interpreted and applied in practice. The absence of scenario-based training or refreshers on less frequently used SOPs—such as chemical spill response—was reported by crew members as a point of concern. Without regular reinforcement, procedural knowledge may degrade over time.

Additionally, **cultural and linguistic barriers** contribute to gaps in application. SOPs are written in English, but interviews revealed that comprehension levels vary significantly, especially among non-native English speakers. Crew members from different backgrounds may interpret instructions differently or rely heavily on visual cues or verbal guidance, increasing the risk of misapplication. As emphasized by **Nguyen et al. (2024)**, language-neutral safety tools, visual aids, and hands-on demonstrations are essential in multilingual crews to ensure clarity and compliance.

Lastly, there is a **lack of feedback mechanisms** for improving SOPs based on real-world experience. Crew members often have suggestions for more practical or efficient ways to carry out tasks safely, but there is no formal platform to communicate these insights back to the management system for SOP revision. This results in a top-

down approach to safety procedures, which may limit adaptability and ownership among frontline workers.

Discussion on the Relationship Between SOP Implementation and Work Safety Outcomes

The findings from MT FTM 24 strongly suggest that there is a direct and measurable relationship between the implementation of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs) and overall work safety outcomes. When SOPs are clearly communicated, consistently applied, and understood by all crew members, the likelihood of workplace incidents decreases significantly. This aligns with the conclusions of **Rahman and Chowdhury (2021)**, who observed that vessels with well-structured and actively reinforced SOPs demonstrated higher safety performance and reduced accident frequency.

Onboard MT FTM 24, areas with **strong SOP adherence**—such as bridge navigation protocols and engine maintenance routines—showed fewer reports of near-miss incidents or procedural deviations. Officers in these departments also reported higher confidence in emergency preparedness and task execution. Conversely, in departments or roles where SOPs were either poorly understood or inconsistently followed, such as cargo watchkeeping and some aspects of deck maintenance, there were higher risks of unsafe behavior and reactive rather than proactive safety responses.

The **presence of SOPs alone**, however, is not sufficient to guarantee improved safety outcomes. The data clearly indicates that **the quality of implementation**—including training, leadership, crew engagement, and feedback systems—plays a pivotal role in determining how effective SOPs are in practice. For instance, crew members who had received formal, scenario-based training demonstrated better decision-making and adherence during safety drills, as opposed to those who relied solely on peer-led, informal instruction. This supports the assertion made by **Fernandez and Liu (2023)** that effective SOPs must be integrated into the organizational culture and continuously reinforced through hands-on application and leadership modeling.

Furthermore, the **psychological dimension of safety culture** was found to influence SOP effectiveness. Where the crew perceived management to be genuinely committed to safety—by enforcing SOPs consistently and encouraging open

communication—compliance levels were higher. On the other hand, when safety was seen as a formality to satisfy inspections, SOP adherence tended to become superficial. This dynamic was similarly observed in the study by **Karvonen and Salokannel (2022)**, who emphasized the role of leadership in shaping safety behaviors and outcomes.

In summary, SOP implementation is strongly correlated with improved work safety outcomes on MT FTM 24, but its effectiveness depends on more than documentation and compliance—it requires active engagement, continuous training, leadership support, and a genuine safety culture. A shift from reactive to proactive safety management is essential to maximize the value of SOPs and protect crew members from occupational hazards.

Comparative Insights with Literature and Standards

The observations and findings from MT FTM 24 reveal a number of parallels—and some divergences—when compared to existing literature and international safety standards. Overall, the vessel exhibits a level of compliance with major maritime safety frameworks, such as the **International Safety Management (ISM) Code**, the **SOLAS Convention**, and other IMO guidelines. These standards require the establishment of a Safety Management System (SMS), which includes documented SOPs, risk assessment procedures, emergency preparedness plans, and continuous training—all of which were found to be formally present on MT FTM 24.

However, when benchmarked against best practices outlined in recent academic literature, several implementation gaps become apparent. According to **Dimitriou and Theotokatos (2020)**, a fully functional safety system is not only procedural but also behavioral—it must integrate safety into the mindset of all personnel. While MT FTM 24 meets procedural expectations on paper, the findings suggest that the **practical, human-centered dimension** of safety culture still requires improvement. This mirrors the conclusions of **Nguyen et al. (2024)**, who emphasized the need for culturally adaptive and inclusive safety communication strategies, especially on multinational vessels.

From a compliance standpoint, MT FTM 24 is aligned with IMO standards concerning documentation, drills, and reporting. Yet, as **Lee and Park (2023)** point out, **"paper compliance"** without deep behavioral integration often results in a passive safety culture—where SOPs are followed only during audits or inspections. This behavior was

observed on MT FTM 24 in departments where procedural discipline was motivated more by fear of non-compliance than by internal safety ownership.

In terms of training, the findings highlight a significant discrepancy between the **ideal continuous learning model** recommended in studies like **Jafari and Chen (2020)** and the relatively static training practices aboard MT FTM 24. While initial safety familiarization is conducted, there is limited structured follow-up, refresher courses, or scenario-based learning that would help reinforce SOP understanding across all crew ranks.

Notably, international standards encourage **feedback loops**—where lessons learned from near-misses or crew suggestions are integrated into SOP revisions. This element was largely absent on MT FTM 24. As **Okeke and Tan (2024)** argue, failure to establish crew-driven feedback mechanisms can lead to procedural stagnation and a lack of continuous improvement in safety protocols.

In conclusion, while MT FTM 24 aligns with formal regulatory expectations and reflects many of the elements discussed in current literature, the effectiveness of its SOP system would benefit greatly from deeper behavioral integration, enhanced training strategies, and the development of participatory safety mechanisms. Bridging the gap between compliance and true safety culture is key to aligning the vessel's practices with global best standards.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the implementation of Occupational Health and Safety (OHS) Standard Operating Procedures (SOPs) aboard the MT FTM 24 and explored their role in enhancing work safety on tanker vessels. The key findings reveal that while formal SOPs are in place and align with international maritime standards, there are notable gaps in their consistent application, especially at the operational level. Officers generally demonstrated strong awareness and compliance, but junior crew members showed varying degrees of understanding and procedural discipline. The study also highlighted inconsistencies in training delivery, limited crew engagement during safety drills, and insufficient feedback mechanisms to inform SOP revisions.

It was further observed that SOP effectiveness is closely linked to leadership, communication, and crew motivation. A compliance-driven safety culture—rather than

one based on intrinsic awareness and shared responsibility—was evident in certain areas of operation. Although MT FTM 24 satisfies regulatory expectations on paper, behavioral integration of safety practices remains an area for development. These findings are consistent with existing literature that stresses the importance of active engagement, inclusive communication, and continuous improvement to create a resilient and proactive safety culture on board.

Recommendations

Based on the findings, the following practical recommendations are proposed to improve the implementation of OHS SOPs on MT FTM 24 and similar tanker vessels:

1. **Enhance Crew Training and Learning Methods**
   Develop structured, scenario-based training programs tailored to each crew role. Refresher courses and simulation drills should be conducted regularly to reinforce SOP understanding and application.
2. **Improve Communication and Accessibility of SOPs**
   Simplify SOP language and incorporate visual aids to support comprehension among non-native English speakers. Ensure that all updated procedures are clearly communicated across departments.
3. **Strengthen Safety Leadership and Role Modeling**
   Officers and safety personnel should actively demonstrate adherence to SOPs, fostering a culture of accountability and professionalism. Leadership involvement during safety drills is essential to reinforce the importance of procedures.
4. **Establish Feedback Loops for Continuous SOP Improvement**
   Introduce regular crew debriefings after drills and operations, allowing suggestions and observations to be recorded and considered in SOP revisions. Empower crew members to participate in safety discussions.
5. **Monitor and Audit Procedural Compliance Proactively**
   Beyond regulatory inspections, internal audits and random checks should be used to evaluate day-to-day compliance and identify behavioral trends that might indicate deeper safety issues.

Suggestions for Policy Improvement and Future Research

From a policy perspective, shipping companies and regulatory bodies should consider mandating **multilingual SOP tools**, standardized refresher training intervals, and participatory safety evaluation mechanisms. Additionally, maritime academies should incorporate applied SOP literacy and safety communication into their curricula to better prepare seafarers.

Future research could explore the effectiveness of **digital safety systems** (such as mobile SOP applications and real-time monitoring tools) in improving procedural compliance. Studies comparing vessels with different safety cultures or investigating the impact of automation on SOP adherence would also provide valuable insights into the evolving dynamics of maritime safety.

Ultimately, improving the implementation of OHS SOPs is not solely a technical issue—it is a cultural one. Strengthening the safety culture through effective training, continuous monitoring, open communication, and leadership commitment is essential to safeguarding crew members and maintaining operational excellence in the maritime industry.

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