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The Strategy for Preventing Delays in the Crew Change Process on the Fleet of PT. Satrya Maritim Indonesia

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ABSTRACT

This study aims to explore the factors contributing to delays in crew change processes at PT Satrya Maritim Indonesia and propose strategic solutions to mitigate these delays. Using a qualitative approach, the research involves in-depth interviews, observations, and document analysis to identify both internal and external factors influencing the delays. Internal factors include limited standby crew, unstructured crew rotation planning, and administrative errors, while external factors involve delays in visa and work permit processing, sudden changes in immigration policies, and weather-related transportation disruptions. The consequences of these delays are significant, impacting the company financially through fines, operational disruptions, and a decrease in crew performance due to extended work periods. The study recommends implementing a structured timeline for crew change, enhancing the standby crew database, digitalizing crew management systems, and improving coordination between internal and external parties. By adopting these strategies, PT Satrya Maritim Indonesia can reduce delays, enhance operational efficiency, improve safety, and strengthen its competitiveness in the global maritime industry.

Keywords: *Crew Change, Qualitative Research, Operational Efficiency, Maritime Industry, Delays.*

ABSTRAK

Penelitian ini bertujuan untuk menggali faktor-faktor yang menyebabkan keterlambatan dalam proses pergantian kru di PT Satrya Maritim Indonesia dan mengusulkan solusi strategis untuk mengurangi keterlambatan tersebut. Dengan menggunakan pendekatan kualitatif, penelitian ini melibatkan wawancara mendalam, observasi, dan analisis dokumen untuk mengidentifikasi faktor-faktor internal dan eksternal yang mempengaruhi keterlambatan. Faktor internal meliputi keterbatasan kru standby, perencanaan rotasi kru yang tidak terstruktur, dan kesalahan administratif, sedangkan faktor eksternal mencakup keterlambatan dalam pengurusan visa dan work permit, perubahan kebijakan imigrasi yang mendadak, serta gangguan transportasi akibat cuaca buruk. Dampak keterlambatan ini sangat signifikan, mempengaruhi perusahaan secara finansial melalui denda, gangguan operasional, dan penurunan kinerja kru akibat bekerja lebih lama dari kontrak. Penelitian ini merekomendasikan penerapan timeline terstruktur untuk pergantian kru, penguatan database kru standby, digitalisasi sistem manajemen kru, serta peningkatan koordinasi antara pihak internal dan eksternal. Dengan mengadopsi strategi-strategi ini, PT Satrya Maritim Indonesia dapat mengurangi keterlambatan, meningkatkan efisiensi operasional, meningkatkan keselamatan, dan memperkuat daya saingnya di industri pelayaran global.

Kata kunci*: Pergantian Kru, Penelitian Kualitatif, Efisiensi Operasional, Industri Pelayaran, Keterlambatan*

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1. INTRODUCTION

Ports The maritime industry, including the offshore shipping segment, is the backbone of global energy and logistics operations, facilitating the mobility of goods, equipment, and personnel in high-risk, time-sensitive work environments (El-Thalji, 2024; Mba, 2025). The reliability of vessel operations, especially offshore operations that demand punctuality, is largely determined by the availability and preparedness of the crew as the "human element" performing navigation, engineering, safety, and operational coordination on-site (X. Ma et al., 2023; Veltsin et al., 2025). In a 24/7 operational system, delays or failures in crew management can directly impact safety, compliance, and contractual performance.

Compliance with working/resting hours and fatigue prevention is not merely a welfare issue, but a regulatory mandate tied to maritime safety. The Standards of Training, Certification and Watchkeeping for Seafarers (STCW) emphasizes fatigue prevention through the regulation and enforcement of rest periods for watchkeeping personnel, along with the "fitness for duty" principle ((IMO), 2020b, 2020a). Additionally, the Maritime Labour Convention (MLC), 2006 sets working/resting hours as the minimum standard for seafarers' labor protection to ensure performance and safety ((ILO), 2006). The implementation of these provisions is reinforced by technical guidelines, including rest period schedule development guidelines, which emphasize consistency with STCW and the need for recording working/resting hours as a compliance tool ((IMO) & (ILO), 2010). In the safety framework, IMO also places fatigue as a systemic risk factor that must be considered in operational decisions and manning ((IMO), 2025).

Various international guidelines highlight that fatigue affects vigilance, decision-making, and task performance, thereby increasing incident risks. IMO

issued “Guidelines on Fatigue” to help stakeholders (companies, seafarers, administration, and training providers) understand the causes and prevention of fatigue ((IMO), 2020b). Other IMO guidelines emphasize the increased fatigue risks during night shifts and mention the time periods prone to incidents (e.g., midnight to 06:00) relevant for designing watch schedules and crew rotations (IMO, 2019). Scientific evidence also supports this, with systematic studies on seafarer fatigue showing that poor work-rest patterns are linked to health and safety risks, offering mitigation options based on scheduling and work organization management (Dohrmann & Leppin, 2017). Other studies reveal the correlation between sleep, watchkeeping, and accidents through incident report analysis, reinforcing that sleep/fatigue factors must be treated as a “material” safety issue (Kerkamm et al., 2021).

In this context, **crew change** becomes a critical operational process as it links compliance with duty/contract hours to the sustainability of vessel operations. Crew change involves more than just "replacing people"; it encompasses a series of processes: rotation planning, standby crew readiness, document fulfillment (certificates, medical, identification), agency coordination, transportation, and synchronization of ship-port-immigration schedules (Ricardianto et al., 2023). When crew change is delayed, the consequences are layered: (1) crew may work beyond their contract period or near the maximum duty hour limits, (2) fatigue risk increases, (3) compliance with rest hour regulations and manning becomes more difficult to maintain, and (4) the risk of operational schedule disruptions and contractual impacts increases ((IMO), 2025). In other words, crew change delays represent both an “operational risk” and a “compliance risk”.

The vulnerability of the crew change process becomes more apparent in cross-jurisdictional situations and dynamic external conditions (e.g., changes in immigration policies, limited flights, or health requirements). During the COVID-19 pandemic, the crew change crisis became the most evident example: IMO, ILO, and ICAO openly called for immediate actions to ensure that seafarers could be replaced and repatriated safely, and be recognized as key workers (IMO et al., 2020). ILO also issued a joint statement to promote ongoing collaboration in addressing the crew change crisis to ensure seafarer safety and supply chain stability (ILO, 2022). At the industry practice level, shipping operators' guidelines also evolved to manage

health protocols, documentation, and crew change workflows for various types of vessels (International Chamber of Shipping, n.d.). Quantitative indicators of industry initiatives show the proportion of seafarers on vessels beyond their contract period during the crisis, emphasizing the operational and humanitarian risk dimensions of crew change delays (De Beukelaer, 2021). The human rights risk perspective during the crew change crisis is also discussed in IMO documents that highlight the systemic consequences for seafarer welfare and supply chain resilience (IMO et al., 2021).

Although the pandemic represents an extreme condition, the root cause of crew change delays often occurs in “normal” conditions, especially related to internal shipping management. Deviations in crew change schedules can often be triggered by logistical delays, port agency coordination issues, and mismatches between planned placement (SPD) and actual field conditions (e.g., vessel delays or administrative processes), which result in increased manning costs (Borovnik, 2024). Studies on crew rotation also emphasize that policy changes, charter party complexity, and document processes can trigger delays in rotation, impacting operational activities and crew unit performance (Yazid Fauzan et al., 2024). Moreover, a study based on the “ship-owner perspective” suggests that methods such as root cause analysis can reveal indirect causes of maritime operation delays, which are relevant for mitigation design (Muhamad & Salleh, 2024).

Scientifically, fatigue and safety studies provide a strong basis for why crew change should be viewed as a risk management process. Fatigue as a real safety risk related to work patterns at sea highlights the need for structured mitigation (Jepsen et al., 2015). Recent doctoral research at the World Maritime University places fatigue as an issue requiring prevention through system management and policy interventions, not just individual interventions (Bhatia, 2024). This aligns with the agenda for safety and fatigue management emphasized by IMO ((IMO), 2020b; IMO et al., 2021).

However, a gap remains in research and practice: many studies stop at mapping the causes of crew change delays, while companies need operational, measurable, and integrative prevention strategies within crew management processes. In other words, organizations require answers at the “how to prevent systematically” level (preventive controls), not just “what causes it.” Additionally,

cross-border contexts (e.g., visa requirements, work permits, and immigration procedures) often create uncertainty, necessitating proactive planning “buffers” and document status monitoring systems—issues that frequently become bottlenecks in practice ((IMO), 2025).

In the context of PT Satrya Maritim Indonesia (SMI) as a crew provider and crew management service, these challenges are evident in operational cases where crew changes are delayed due to incomplete crew visa processing and rotation planning that is too close to the end of duty. Delays in vessels operating across jurisdictions highlight two key points: first, the crew change process is highly sensitive to external document lead time; second, internal decisions regarding rotation schedules and standby crew readiness determine how well the organization can absorb external uncertainties. In regulatory and safety terms, these conditions are relevant as delays can amplify fatigue risks and place organizations in a vulnerable position regarding duty/rest hour compliance ((IMO) & (ILO), 2010; (IMO), 2025; ILO, 2022)

Based on these premises, this study aims to: (1) identify the causes of crew change delays in the operational context of PT Satrya Maritim Indonesia through internal-external factor mapping; and (2) formulate prevention strategies that can be applied to reduce delay probabilities, improve compliance, and enhance vessel operation reliability. The contribution of this study is expected to be dual: practical contributions in the form of actionable strategies (e.g., visa/permit lead time management, proactive document status early warning, rotation buffer policies, standardization of agency/client coordination), as well as academic contributions in the form of a conceptual model linking crew change as a risk management process within safety, rest hour compliance, and operational performance domains ((IMO) & (ILO), 2010; Jepsen et al., 2015).

2. METHODS

2.1 Research Approach

This study employs a descriptive qualitative approach aimed at describing and analyzing the phenomenon of crew change delays at PT Satrya Maritim Indonesia, as well as formulating strategic measures to address this issue systematically and sustainably. This approach was chosen because it

allows the researcher to gain a deeper understanding of the factors influencing delays and to develop field-data-based recommendations that are rich in context.

2.2 Research Location and Subjects

The research was conducted at PT Satrya Maritim Indonesia, located in Batam, Indonesia, a company engaged in providing ship crews for offshore operations. This study involves various parties involved in the crew change process, namely the crewing department, crew members directly involved in the crew change, as well as external parties such as port agents and immigration authorities. The research subjects include:

a) The manager and staff of the crewing department responsible for crew rotation planning.
b) The ship crew directly involved in the crew change process.
c) External parties, such as visa and work permit agencies, as well as immigration authorities involved in the smooth administration of the crew change.

2.3 Data Collection Techniques

The data collection methods used in this research include three main techniques:

a) Participatory Observation: The researcher was directly involved in the observation process during the implementation of crew changes at PT Satrya Maritim Indonesia. This observation covered monitoring administrative processes, document management, and coordination between the parties involved in crew change, both internal and external.
b) In-depth Interviews: Semi-structured interviews were conducted, allowing flexibility in asking questions, while still focusing on the main themes to be examined, such as the causes of crew change delays and potential solutions. The interview subjects included crewing managers, department staff, and several crew members involved in the crew change process.
c) Documentation: Secondary data was obtained through the analysis of company documents, including operational reports, crew change delay reports, crew administrative records, and other related documents. This

documentation was used to support the findings from interviews and field observations

2.4 Data Analysis Techniques

The collected data was analyzed using thematic analysis to identify key themes emerging from interviews and observations. The analysis steps included:

a) Data Coding: The interview and observation data were analyzed by coding each segment of data that was relevant to the research themes. This process was iterative to ensure that all relevant data was coded correctly.

b) Categorization: After coding, the data was grouped into categories related to the causes of delays, proposed solutions, and strategies that could be implemented to address the delays.

c) Contextual Analysis: In this analysis, the researcher considered the social and operational context affecting the crew change process at PT Satrya Maritim Indonesia. This approach allowed for a deeper understanding of why the delays occur and how the proposed solutions could be implemented, considering realworld conditions.

d) Triangulation: To increase the validity of the findings, this study employed data triangulation, examining the consistency of data obtained from various sources, such as interviews, observations, and documentation. Triangulation was also conducted between qualitative and quantitative data to strengthen the research findings.

2.5 Validity and Reability

To ensure the validity and reliability of the data, this study used several techniques:

a) Source Triangulation: Data was collected from various sources (interviews, observations, documentation) and included multiple informants from various positions and backgrounds within the company. This approach ensured that the data obtained was more comprehensive and represented a wider range of perspectives.

b) Data Verification: The researcher conducted a verification of interview transcripts and observation notes to ensure that the information gathered was accurate and free from bias in interpretation.

c) Member Checking: The initial findings were sent to several informants for verification of their accuracy and alignment with their experiences.

2.6 Theoretical Approach

The theoretical approach used in this study draws from strategic management and total quality management (TQM) to identify and formulate strategic measures that can be implemented to reduce crew change delays. The strategic management theory developed by Hitt et al. (2013) on competitive advantage and long-term planning is relevant for formulating sustainable strategies. Additionally, the principles of TQM, as outlined by Sallis (2002) are used to propose continuous improvements in the crew management and administration systems at PT Satrya Maritim Indonesia.

2.7. Urgency of the Study

Delays in the crew change process not only impact vessel operations but also potentially reduce work safety, client satisfaction, and increase costs for the company. Therefore, this study holds high urgency in contributing to the improvement of managerial efficiency in the maritime industry, particularly in crew management. The findings from this study are expected to provide concrete solutions that can be implemented by PT Satrya Maritim Indonesia and other shipping companies to systematically, strategically, and sustainably address crew change delays.

3. RESULT AND DISCUSSION

This study aims to identify the factors causing delays in the crew change process at PT Satrya Maritim Indonesia and to formulate strategic measures to address these issues. Based on data collected through field observations, interviews with relevant parties, and analysis of the company's operational documents, it was found that delays in the crew change process at PT Satrya Maritim Indonesia are caused by various factors that can be categorized into internal and external factors.

3.1 Internal Factors

The most dominant internal factor contributing to crew change delays is the limited number of standby crew. PT Satrya Maritim Indonesia faces challenges in

managing the number of standby crew that matches the operational needs of the vessel. Many crew members have incomplete documents or certificates that are close to expiration, which slows down the crew replacement preparation. Additionally, unstructured and unorganized crew rotation planning exacerbates the problem. In an interview with the head of the crewing department, it was stated that rotation planning is often made too close to the crew change date, making it difficult for the department to prepare all the administrative and medical aspects of the crew on time. This delay is further worsened by the weak system for monitoring ex-crew members. The lack of oversight of crew members who have completed their assignments makes it difficult for the company to ensure their readiness to return to duty.

3.2 External Factors

External factors also play a significant role in crew change delays. The process of obtaining visas and work permits for crew members assigned to work overseas, particularly in countries with strict immigration policies like Brunei Darussalam, often takes longer than expected. Sudden changes in immigration policies also serve as an external factor, as the company must adjust alreadyprocessed documents to comply with new regulations. Transportation delays, such as flight delays caused by bad weather, also become an external factor that hinders the timely delivery of crew members to the vessel location. Special requests from clients, such as Brunei Shell Petroleum (BSP), which imposes strict limits on crew duty periods, also affect the smoothness of crew changes. The stringent regulations imposed by clients increase pressure on the company to ensure that crew changes occur on time.

3.3 Impact of Crew Change Delays

The impact of crew change delays is quite significant and affects various aspects. Financially, the company must bear fines from clients if crew changes are delayed, and in some cases, the company may also lose long-term contracts with clients. Furthermore, delays in crew replacement directly impact crew performance, as crew members often work beyond their contract periods. Crew members who work beyond their contract period frequently experience physical and mental fatigue, which can decrease their work quality and increase the potential for workplace accidents. Operational disruptions also occur, causing the vessel to be unable to

operate according to the predetermined schedule. This leads to the company's inability to meet logistical requirements or other operational goals.

Table 1: Impact of Crew Change Delays on Financial and Operational Aspects of the Company

Category	Contributing Factor	Description	Main Cause
Internal Factors	Limited Standby Crew	The number of standby crew members is limited, and many have incomplete documents or certifications nearing expiration.	Insufficient number of qualified standby crew
	Lack of Structured and Systematic Rotation Planning	Crew rotation planning is conducted too close to the scheduled crew change, hindering proper administrative and medical preparation.	Lack of a clear and structured planning system
	Weak Monitoring of Ex-Crew	There is insufficient monitoring of crew members who have signed off, making it difficult to ensure their readiness to return to work.	Lack of an effective monitoring system
	Administrative Errors	Errors in document filing, ticket booking, and certificate verification delay the crew change process.	Poor coordination between departments
External Factors	Long Visa and Work Permit Processing Time	Visa and work permit processing often takes longer than expected, especially in countries with strict immigration policies.	Lengthy processing time for visas and permits
	Sudden Changes in Immigration Policies	Unexpected changes in immigration policies require adjustments to already processed documents, causing delays.	Regulatory uncertainty
	Bad Weather and Transportation Issues	Flight delays due to bad weather and transportation disruptions delay crew arrival at the vessel.	External environmental factors affecting transport
	Special Client Requests	Urgent client demands (e.g., BSP) require crew changes to be carried out within strict timelines.	Client-imposed deadlines and requirements

The impact of crew change delays can harm the company in various aspects. Table 1 illustrates how these delays affect the company's finances, crew

performance, work safety, and vessel operations. These impacts not only affect the company financially but also have the potential to damage the company's reputation in the eyes of clients and other stakeholders.

3.4 Strategic Steps to Address Crew Change Delays

Based on these findings, strategic measures that PT Satrya Maritim Indonesia can implement to address delays in the crew change process include creating a more structured and measurable timeline. Each stage in the crew change process needs to have a clear deadline so that every step can be carried out systematically and on time. The creation of a structured timeline (TIMTER) is expected to help the company avoid delays caused by rushed planning.

Next, the company needs to strengthen the standby crew database, which contains detailed information about the status of documents, certificates, and the medical condition of the crew. With a more comprehensive database, the company will find it easier to monitor crew readiness and identify crews that meet the requirements for deployment. The implementation of a Crew Management System (DCMS) based on digital technology is also a highly relevant solution. By adopting a digital system, the crew administration process can be simplified and expedited. This digitalization allows real-time monitoring of crew status, minimizes administrative errors, and accelerates the crew change process.

Better coordination between internal departments such as crewing and administration, as well as external parties like visa management agencies and immigration authorities, is also essential. By improving communication, the administration process and visa management can be sped up, thus reducing delays caused by external factors. Additionally, the company should adjust crew rotation patterns to be more flexible. Changing the rotation pattern to a more flexible one, such as 3 months on - 2 months off, would provide more buffer time to handle administrative or unexpected weather-related issues.

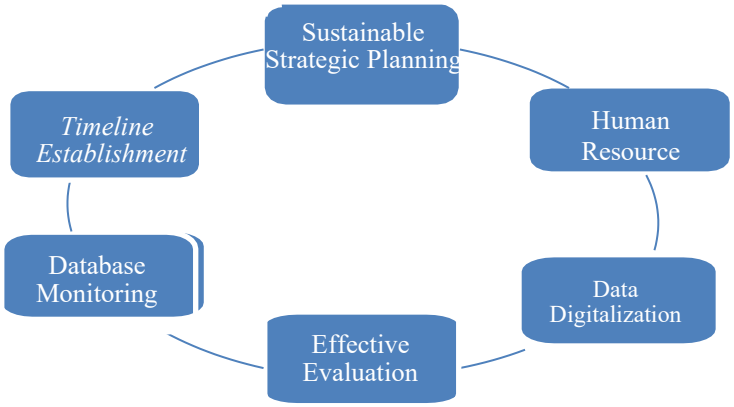

Figure 1: Strategic Steps in the Crew Change Process at PT Satrya Maritim Indonesia

Delays in the crew change process at PT Satrya Maritim Indonesia have a significant impact on various operational and financial aspects of the company. Based on the findings of this study, the most dominant internal factors contributing to delays are the limitations of standby crew and unstructured rotation planning. Research by Sulistiana et al. (2025) states that the company often struggles to manage standby crew ready to serve, given that many crew members have incomplete documents or their certificates are nearing expiration. This causes delays in the crew change preparation (Maharani et al., 2025). Furthermore, unorganized crew rotation planning exacerbates this problem. Pangayuh et al., (2025) emphasize the importance of thorough planning to ensure that the crew change process can be carried out on time, without being hindered by internal factors that could be anticipated from the start.

External factors, particularly visa and work permit processing, also worsen delays in the crew change process. The processing of visas, which takes longer than expected, is an external factor that cannot be entirely controlled by the company (De Beukelaer, 2021). Sudden changes in immigration policies, often occurring without prior notice, make the crew's administrative process more complex and potentially extend the time needed to perform the crew change (Luchenko & Georgiievskyi, 2021). Additionally, transportation delays caused by bad weather further complicate the situation, as the crew cannot arrive at the vessel location on time, risking disruption to vessel operations (Sun et al., 2025). In line with these findings, Lau et al., (2024) revealed that reliance on unpredictable external factors, such as weather and transportation, is indeed one of the major challenges in the maritime industry.

The impact of crew change delays identified in this study is extensive, encompassing significant financial losses and reduced crew performance. The decline in crew performance due to physical and mental fatigue aligns with the findings of M. Ma & Liao (2025) who show that crews working beyond their contract period are at risk of workplace accidents. This highlights the importance of better crew rotation management to avoid fatigue that can lower work quality and increase accident potential. Furthermore, operational disruptions caused by crew change delays also remain a critical issue that needs to be addressed. As Karmeli (2025), explained, inefficient management can cause significant disruptions to the company's performance, especially in meeting the agreed operational schedules for the vessel. Therefore, strategic measures such as establishing structured timelines, strengthening the standby crew database (DKSP), and digitalizing the crew management system (DCMS) are highly relevant solutions that can be applied to address the delays occurring (Purnaningratri et al., 2025; Rapika et al., 2025).

4. CONCLUSION

This study identifies that delays in the crew change process at PT Satrya Maritim Indonesia are caused by internal factors such as limited standby crew, unstructured rotation planning, and administrative errors, as well as external factors such as time-consuming visa and work permit processing, changes in immigration policies, and transportation disruptions caused by adverse weather conditions. The impacts of these delays include financial losses, decreased crew performance, and vessel operational disruptions, which in turn reduce efficiency and damage the company's reputation.

To address these issues, this study recommends three strategic measures. First, the implementation of a digitalized crew management system to monitor crew status in real time and reduce administrative errors. Second, the development of a more structured and flexible crew rotation timeline to avoid dependence on unpredictable external factors. Third, improving internal and external coordination, particularly with visa processing agents and immigration authorities, to accelerate administrative processes and minimize delays. Through these measures, PT Satrya Maritim Indonesia can enhance operational efficiency, reduce delays, and strengthen its competitiveness in the global maritime industry.

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