

Implementation of OHS Internal Audit as Hazard Control at Semarang Container Terminal

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Abstract: The rapid growth of global maritime trade has increased the risk of occupational accidents at container terminals, necessitating a strong Occupational Health and Safety (OHS) system. This study aims to examine the relationship between the implementation of internal OHS audits, communication patterns, and hazard control at container terminals in Semarang City. Using a qualitative descriptive method with a case study approach, this research seeks to gain an in-depth understanding of the interplay among internal audits, communication, and hazard control. Data were collected through method triangulation, including in depth interviews, field observations, and document analysis, involving HSE staff, internal auditors, supervisors, and auditees. Data analysis was conducted using ATLAS.ti software through open coding, axial coding, and selective coding stages. The findings reveal that systematic internal audits, supported by integrated digital communication systems and structured discussion forums, significantly contribute to hazard control and worker compliance. The integration of audit processes and communication fosters a safety-oriented work culture and accelerates audit resolution. This study concludes that the synergy between routine audits and effective communication enhances the effectiveness of hazard control programs. The research contributes to OHS literature by presenting a comprehensive model integrating audit practices, communication strategies, and hazard control mechanisms.

Keywords: Container Terminal; Hazard; Internal Audit

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Submitted: December 18, 2025; **Revised:** April 03, 2026; **Accepted:** September 27, 2026

DOI: <https://doi.org/10.15294/jse.v4i2.30124>

INTRODUCTION

Domestic and international trade development has fuelled the rapid growth of waterborne trade traffic. As much as 90% of world trade passes through waterways, with 40% passing through Indonesia (Natalis & Hakim, 2021). Waterway trade is carried out using ships, which will then be transferred to land routes via the container terminal. Container Terminal X is one of the State-Owned Enterprises engaged in providing cargo transfer services between two modes of transportation. In 2024, there was an increase in international container throughput of 10.28 percent, which was recorded at 3,995,525 TEUs (Twenty Foot Equivalent Units) (Khasabu, 2025). The more cargo that is moved, the higher the risk of hazards, whether from heavy equipment, lifting activities, vehicle movements, or hazardous materials.

About half of maritime accidents in 2022 occurred at ports and terminals (N. Wang et al., 2024). Based on the KNKT Shipping Investigation Report, from 2015 to 2024, 18 accidents were recorded at ports or terminals. The types of accidents varied, such as fires, explosions, collisions, capsizing, and spills (KKNI, 2025). According to a study conducted by (Khan et al., 2023), which analyzed 348 cargo accidents, several factors that caused ship accidents at ports were human factors, ship conditions, terminal facilities, policies, equipment, and the environment. The factor that had the most significant impact was the human factor. According to (Kara, 2016), as many as 61% of ship accidents at ports occurred at dry bulk terminals, 23% at passenger terminals, 10% at container terminals, and the rest at liquid bulk terminals. Most accidents occurred when ships were moored at the pier, but the most fatalities occurred during loading and unloading. These accidents were caused by human error, where workers did not obey existing regulations. In addition to fatalities, accidents at container terminals also result in losses due to damage to cargo containers from 2015 to 2019, the average loss was 643 containers per year, of which 386 sank in accidents. Sixty

percent of container losses occurred at the terminal due to loss of balance, crane operator error, crane falls, and fires (Kaup et al., 2022).

According to Oktari (2021), container loading and unloading activities at port involve a number of potential hazards that can cause workplace accidents, especially if safety procedures are not implemented properly. One example of a risk occurs in the process of moving containers to trucks using the Reach Stacker tool. In this case, workers who do not use personal protective equipment such as helmets are at risk of injury, which can be exacerbated by human error, such as the Reach Stacker operator losing focus. In addition, damage to equipment is also a significant risk factor, especially if regular inspections and maintenance are not carried out (Oktari, 2021). Therefore, to overcome the risk of hazards that occur at container terminals, an effective and sustainable OHS management system is needed. The implementation of good safety standards will reduce the risk of accidents and losses at the terminal (Antão et al., 2016). The impact of implementing good OHS management such as resource allocation can increase knowledge of risk factors for workers (N. Wang et al., 2024). Based on research by (Tseng & Pilcher, 2017), occupational safety training for container terminal operators that is oriented towards management refers more to optimal safety performance. This shows that the work climate and habits in the implementation of OHS management have an influence on the management of hazard risks. Hazard risk management or what is called control management is a step needed to protect workers from exposure to a substance or system and the form of a system and education for workers to monitor their health and safety.

Internal OHS audit is one of the key mechanisms within the OHS management system to identify potential hazards, evaluate compliance with standards, and ensure the effectiveness of risk control. An audit is a strategy to improve the quality and effectiveness of OHS management in a company and create safe working conditions (Petchenko, 2023). Internal audits are carried out with various strategic objectives, including to ensure that the implementation of the Occupational Safety and Health Management System (OHSMS) is carried out consistently, to improve the quality of OHS implementation in the company environment, and to ensure the company's readiness to face emergencies or unwanted events. In order to achieve these goals, periodic evaluation through internal audits is a crucial step to review and improve the quality of OHS implementation, both in terms of administration and the feasibility of the facilities and infrastructure used (Benakka et al., 2021). However, according to research by (Darabont et al., 2017), non-compliance with legal requirements (findings) will not be detected if internal OHS audits are not appropriately implemented. This is due to the auditor's lack of identification and knowledge.

In the implementation of internal OHS audits, audit communication plays an important role in supporting the effectiveness of its implementation. Structured and efficient communication is crucial in achieving company goals, especially in supporting efforts to improve occupational safety and health. Referring to Government Regulation Number 50 of 2012 concerning the implementation of the Occupational Safety and Health Management System, article 13, all information related to OHS must be communicated to internal and external parties and documented systematically. This provision is in line with the ISO 45001:2018 standard, particularly in Clause 7, which emphasizes the importance of communication both internally and with external parties. In addition to serving as an evaluation tool, communication of audit findings also reflects transparency and strengthens the OHS culture in the work environment. Audit results can be used to formulate preventive actions through risk management, which aims to identify and control potential workplace hazards to reduce the number of work accidents.

The consistency of audit implementation and the quality of communication affect how companies control hazards. In order to improve the implementation of the OHS management system, a deep and comprehensive understanding of the relationship between audit implementation, internal communication, and how hazards are controlled in the company is needed. Specifically, this study analyzes (1) the relationship between internal audit implementation, communication, and hazard control; (2) the communication patterns used in delivering audit messages; and (3) to evaluate the current OHS internal audit practices and identify the factors that influence their effectiveness. Several previous studies related to OHS audits tend to examine OHS audits separately without analyzing the aspects of communication and hazard control. In addition, the communication aspect has not been analyzed in depth, even though it is a factor that influences the success of OHS audits. This study can serve as a reference in developing more effective OHS policies, especially in OHS internal audits.

METHODS

This research was conducted using a descriptive qualitative method with a case study approach to understand the relationship between internal OHS audit, communication, and hazard control. This approach was chosen because it can analyze the interaction between complex aspects and provide insight from each stakeholder's perspective. The data collection method used was triangulation, which included in-depth interviews with HSE operators, internal auditors, supervisors, and auditees as well as observations of participation in the internal audit process (Colorafi & Evans, 2016).

Data analysis was performed using ATLAS.ti software, which is a CAQDAS (Computer-Aided Qualitative Data Analysis Software) that allows for qualitative data processing. In addition, ATLAS.ti can document the analysis results in a transparent, reflective, thorough, and systematic manner (Paulus & Lester, 2016). The data processing process begins with open coding to filter and identify categories. Then, axial coding is carried out to create links between categories. The last stage is selective coding, which connects all categories by focusing on the central concept to develop a theoretical model.

RESULT AND DISCUSSION

Container Terminal X is one of the companies that manages cargo transfers in Semarang City. With over 100 workers and potential hazards, this company must implement the Occupational Health and Safety Management System (OHSMS). An OHS audit is required to evaluate and monitor the OHS Management System, whether internal or external. Based on our interview, this company has carried out an advanced OHSMS certification, including an external audit with 166 criteria and satisfactory results. Internal audits are usually conducted in preparation for external audits and aim to measure OHS performance and control risks in the system periodically. OHS audits not only measure the final results of an OHS program but also assess how the OHS process in a company meets applicable standards (Robson et al., 2017). Internal audits are conducted at least once every two years or when certain conditions exist, such as a letter of instruction from the head office (Alqudah et al., 2023). There are three main stages when conducting an internal audit: preparation, implementation, and completion (Chang et al., 2019). Before starting the audit, a notification letter is required from the terminal or head office along with an appointment of an internal auditor. The internal auditor is usually one of the company's HSE personnel who already holds an OHS auditor certificate. The appointed auditor will then provide information to all divisions to collect documents related to OHS and appoint a division representative to become an auditee.

The internal audit was carried out over approximately three days, covering document inspection, field observation, and interviews. It began with planning and meetings to discuss what the audit would involve and collect all the necessary OHS documents (Shabani et al., 2024). The audit used a form or checklist to mark any indicators that did not comply with the regulations. The indicator used was SMOHS, which included 12 elements and 166 criteria. According to PP no. 50 of 2012, the elements of SMOHS are (1) Development and Maintenance of Commitment; (2) Documentation Strategy; (3) Review of Design and Contract; (4) Document Control; (5) Purchasing; (6) Worker Safety and Health based on SMOHS; (7) Monitoring Standards; (8) Reporting and Correction of Deficiencies; (9) Material Management and Movement; (10) Data Collection and Use; (11) OHS Management System Audit; (12) Skills and Abilities Development (Wibowo & Sajiyo, 2023). Field observations are carried out to ensure that implementation in the field corresponds with documented procedure. Checks carried out include the completeness of APAR, safety signs, PPE, and first aid equipment. Interviews are conducted with auditees to verify and further investigate any findings. If findings exist they will be summarized and entered into the company's computer system. Stakeholders such as HSE personnel, internal auditors, and managers can access this system. Findings will be resolved (closed) at the earliest or the latest 2 months from the issuance of the minutes. Closing findings will be reported through the system through results and documentation.

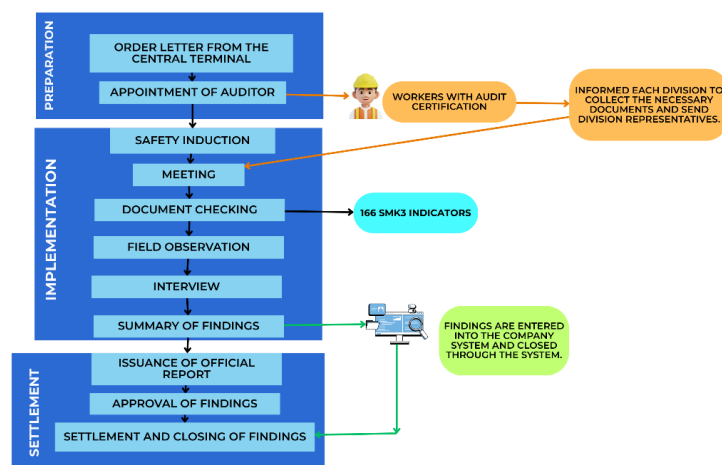


Figure 1. OHS Internal Audit Implementation Flow

To address the existing hazard risks, Container Terminal X has several leading OHS programs, such as terminal sterilization and patrols, to monitor conditions at the port safely and ensure worker compliance with OHS

policies. Besides, patrols also have a significant influence on worker safety behavior (Harianto et al., 2022). Safety patrols are carried out three times per shift, namely at the beginning, mid-shift, and end of the shift. In addition to patrols, monitoring is also carried out remotely using surveillance cameras. The HSE team is also responsible for ensuring the completeness of OHS in each division according to minimum standards. To evaluate the program, a PKP2 meeting is held once a month to discuss findings, incidents, and plans for the following month. Safety education and induction are carried out to increase worker awareness of hazards (Hashim et al., 2018). Safety induction is carried out if some new visitors or workers enter and perform activities in the company area. Existing safety education includes OHS posters, health promotion, APAR training, and Corporate Life Savings Rules (CLSR).

The success of the OHS program in controlling hazards is influenced by routine evaluation and monitoring (Skład, 2019). An internal audit is one form of evaluation that influences OHS performance in a company (Robson et al., 2017). Internal audits will be effective if the quality of communication between the auditor and the auditee is good. The communication pattern at container terminal X already relies on technological assistance. Data collection and audit documentation are carried out when reporting findings using an integrated company computer system. This digital system has advantages such as accelerating message delivery, more integrated communication, and improving audit performance (Martínez-Caro et al., 2020). In addition, company managers can find out how the process of resolving findings is direct. Even though using a system, auditors must still follow up and communicate directly with auditees to resolve existing findings, so that any obstacles, they can be handled immediately. Auditors must have good communication skills to connect messages to workers, HSE personnel, and managers in the company. One of the communication media is through joint discussions before and after the audit, where the auditor will discuss the audit plan, how the program will resolve the findings, the priorities of the findings, and employee commitment (Dyjack et al., 2003).

Based on the results of interviews and observations, there is a relationship between internal OHS audits, communication patterns, and hazard control methods. These three aspects influence each other. A routine audit schedule and a systematic flow characterize a good and effective OHS audit. As explained above, the company's audit is carried out at least once every two years, and the systematic flow uses a system. The use of computer technology facilitates communication between auditors and auditees so that audits will be completed faster. In addition, good communication, such as discussion forums, can encourage the role of central management in monitoring and contributing to the audit process. As a result, the findings will be resolved quickly (Endaya & Hanefah, 2016). Discussion forums also encourage worker commitment to OHS audits and the resolution of finding (Pandit et al., 2019), where workers can convey their ideas regarding developing OHS programs in the company. So that the existing program can meet the needs of workers there. Joint discussions also accelerate the design of existing hazard control priorities, where programs can be adjusted to available resources (Renn, 2020). OHS audits play a role in accelerating hazard control by systematically identifying potential hazards and ensure compliance with applicable safety standards (Cahyaningtyas et al., 2023). OHS audits can also increase worker awareness of safety by indirectly promoting OHS. Research by (Mujtaba & Kaifi, 2023) states that audits ensure that all employees can work safely and are prepared for unforeseen inspections.

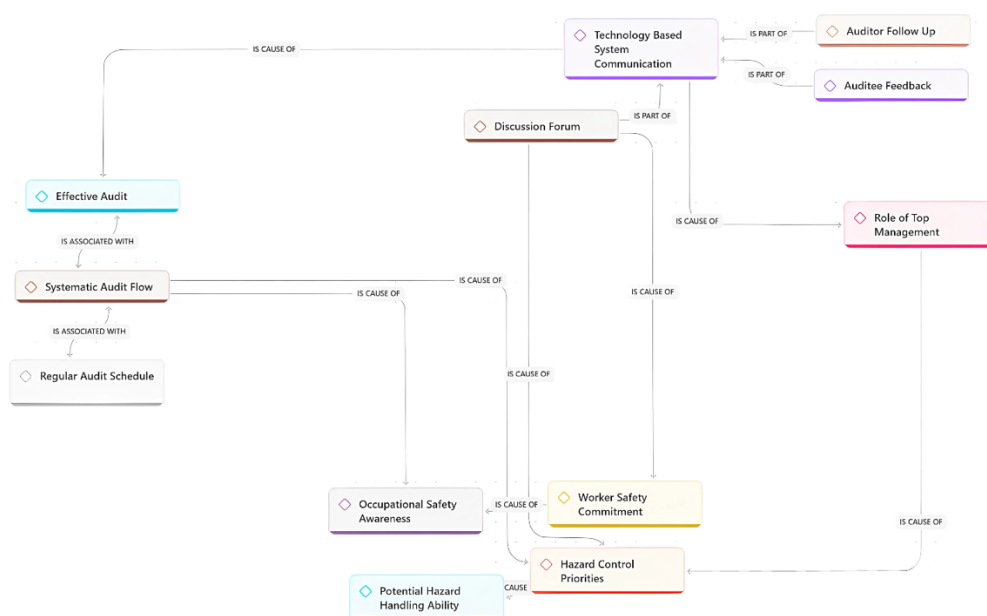


Figure 2. Relationship between OHS Internal Audit, Communication, and Hazard Control

The company's OHS audit has been carried out routinely, but its effectiveness depends on how the findings are followed up. If the audit is only administrative in nature, it will not be successful in controlling the potential hazards. An effective audit can be characterized by reciprocity and the roles and responsibilities of related stakeholders (Van Gelderen et al., 2017). Herliana & Kuntadi (2023) state that internal audits influence internal performance, and that communication and monitoring also influence company performance. In an audit, there must be dynamics among workers when expressing their opinions. This can be minimized by having a discussion forum that accommodates all opinions. The existence of good communication media can help in aligning perceptions, reducing obstacles, and helping analyze potential hazards (Y. Wang et al., 2019). A holistic approach to internal OHS audits and effective communication can create a comprehensive risk management system. According to research by (Almgrashi & Mujalli, 2024), a sustainable risk management system supported by internal audits can strengthen a company's resilience in achieving its goals..

CONCLUSION

From the results of this study, it can be concluded that there is a reciprocal relationship between systematic internal OHS audits, effective communication, and forms of hazard control at the Semarang container terminal. Routine schedules and system-based audit flows characterize systematic audits. There are good communication media such as discussion forums, the role of top management, and worker commitment in following up on findings. As a result, the hazard control program is made according to the needs and resources available. This can improve company performance, especially in the area of worker safety and health. To improve performance, companies can strengthen risk-based internal audit capacity, improve auditor competence, conduct periodic evaluations, and develop and adopt an open communication system. This study has limitations in the variation of variables considered and limited access to information. Additionally, variables such as OHS performance, organizational culture, and inter-sectoral studies can be used for further research.

DECLARATION OF GENERATIVE AI

The authors declare that no generative AI or AI-assisted technologies were used in the writing process of this manuscript.

DECLARATION OF COMPETING INTEREST

We are thankful to our entire Solara team for giving their inputs and suggestion, which has helped us writing this article.

FUNDING STATEMENT

This research received no external funding.

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