BORNEO JOURNAL OF SCIENCES AND TECHNOLOGY (BJoST)
VOL. : 7, ISSUE: 2, 112 - 120
DOI: http://doi.org/10.35370/bjost.2025.7.2-09
e-ISSN: 2672-7439

University of Technology Sarawak

ORIGINAL ARTICLE

Evaluation on Adequacy of Department of Occupational Safety and Health's Occupational Safety and Health Workplace Assessment (DOSH OSHWA) at Ports in Sarawak

*Dayang Noor Azie Abang Zainal Abidin, Mohd Azimie Ahmad and Zalikha Raman

School of Engineering and Technology, University of Technology Sarawak, 96000 Sibu, Sarawak, Malaysia

ABSTRACT - The Department of Occupational Safety and Health (DOSH) in Malaysia developed the Occupational Safety and Health Workplace Assessment (OSHWA) checklist to promote compliance with safety standards across various industries, including maritime operations. However, the adequacy and practical implementation of this checklist in real port environments remain uncertain. This study evaluates the effectiveness of the OSHWA checklist at three selected ports in northern, southern and central region of Sarawak through a comparative analysis approach. The methodology includes a detailed review of the checklist, field observations of safety practices, and interviews with port personnel to assess actual implementation. These findings are then compared against national safety regulations to identify gaps and compliance issues. Key findings reveal deficiencies in hazardous chemical handling, emergency preparedness, and maintenance practices. Based on the analysis, this research proposes targeted recommendations for checklist revision, enhanced training, and infrastructure upgrades to improve workplace safety and regulatory compliance at Sarawak's ports.

ARTICLE HISTORY
Received: 07 Feb 2025
Revised: 10 Apr 2025
Accepted: 02 May 2025
Published: 31 July 2025

KEYWORDS
OSHWA, Hazardous chemical, Emergency preparedness, Sarawak ports.

INTRODUCTION

The maritime industry plays a vital role in global trade, particularly in Malaysia, where ports serve as key hubs for economic activity. All ports have few warehouses with different storage good facilities and equipped with different types of building design and requirements. A warehouse is a place where products are kept, either outdoors or indoors which come in a variety of sizes and designs, constructed from a variety of materials, and outfitted with a range of technologies, including fully and partially automated systems. With the complexity of operations at these ports, workers are exposed to a range of safety hazards that necessitate stringent safety protocols.

The main causes of injuries in warehousing are slips and trips (26%), manual handling (18%), falls from height (16%), being hit by a moving or falling object (13%), being hit by a moving vehicle (10%), being hit by something fixed or stationary (8%), and others (9%) [1]. Warehouse management is intended to benefit warehouse activities that have an impact on the entire manufacturing process. According to Azizi et al. [2], well-managed warehousing management can improve the efficiency of material control or material handling in the warehouse.

Every warehouse should have an extensive safety program that includes controls for material storage, fire safety, material handling, personal protective equipment, safe chemical handling, powered industrial trucks, dock safety, machine guarding, ergonomics, manual product handling, a comprehensive safety program, and facility emergency plans [3]. Warehouses are fast-paced environment where things are frequently moved, machinery is used, and employees work continuously to perform their tasks. However, despite all of the bustle, it is critical not to overlook the necessity of safety. By identifying potential hazards and enforcing robust safety measures, warehouse managers can protect their personnel and assets while maintaining operational efficiency.

*Corresponding Author: Dayang Noor Azie Abang Zainal Abidin. University of Technology Sarawak (UTS), email: dygnazie@uts.edu.my

Ports in Malaysia are vital nodes in the supply chain, accommodating the storage and handling of various goods. However, the dynamic and high-risk nature of port operations makes them particularly vulnerable to occupational hazards. Warehousing activities in ports involve frequent use of heavy machinery, complex material handling, and continuous movement of goods and personnel. Despite safety guidelines and protocols, the implementation of robust safety measures remains inconsistent, leading to a high number of workplace injuries and incidents. This gap highlights the need for a structured safety framework, such as the OSHWA checklist, to identify hazards and implement effective controls.

Given the scale and complexity of port operations, warehouses face unique challenges, including managing hazardous materials, handling large cargo volumes, and ensuring safety in congested spaces. Addressing these challenges requires a thorough evaluation of existing safety measures. The OSHWA checklist, developed by Malaysia's Department of Occupational Safety and Health (DOSH) in 2005 [4], offers a structured approach to workplace safety. Aligned with Malaysia's Occupational Safety and Health Act (OSHA) 1994, it reflects DOSH's mission to promote safe and healthy working environments [5]. Its components include hazard identification, risk assessment, documented safety procedures, regular maintenance schedules, emergency preparedness strategies, employee training, and fostering a safety-conscious workplace culture. It is designed to address workplace hazards comprehensively and ensure that employees and assets are protected in various industries, including warehousing.

Checklists like the OSHWA are indispensable tools for safety inspections. In high-risk environments such as ports, they help ensure that no critical safety measures are overlooked while providing a framework for compliance with safety regulations. Their effectiveness relies on thorough inspections, risk assessments, consistent implementation of safety protocols, and fostering a safety-conscious workplace culture. Additionally, these checklists support emergency preparedness, prioritize safety in warehouse design, and enhance overall operational efficiency.

This study aims to evaluate the adequacy of the OSHWA checklist in the context of port operations. Considering the unique safety challenges posed by warehouses in ports, this assessment seeks to determine whether the checklist sufficiently addresses the specific risks and hazards associated with these environments. By doing so, the study aims to contribute to the enhancement of safety standards. Ultimately, adopting a tailored safety inspection checklist for port operations can protect employees, assets, and the public while safeguarding property, equipment, and the reputation of the industry.

MATERIALS AND METHODOLOGY

The study employs a comparative analysis approach to assess the adequacy of the OSHWA checklist at three selected ports in Sarawak that covering northern, southern and central region. The materials for this study include the OSHWA checklist, safety regulations and relevant guidelines. Methodologically, the research consists of the following components. First, a review of the OSHWA checklist was conducted to identify its key provisions and understand its requirements in detail. This was followed by detailed field observations at the selected ports, focusing on the implementation of safety standards. These observations involved direct assessments of working conditions, particularly in relation to hazardous chemical handling, emergency preparedness, and general safety practices. The observed conditions were then aligned with the OSHWA checklist to identify any discrepancies or gaps.

Additionally, interviews were conducted with workers, port managers, and safety officers to gain insights into the existing safety culture and the specific challenges faced in complying with safety protocols. The interview process involved selecting respondents based on their roles and experience in port operations to ensure diverse perspectives. Semi-structured interviews were used to allow flexibility while maintaining focus on key safety issues. All interviews were conducted in person at the port facilities with the respondents' consent. A comprehensive safety compliance assessment was also carried out by comparing the actual safety practices observed during fieldwork with the requirements outlined in the OSHWA checklist, highlighting any inconsistencies.

Furthermore, the findings were analyzed against national safety regulations and guidelines, including the Occupational Safety and Health Amendment Act (OSHA(A)) 2022, Uniform Building By-Laws (UBBL) 2021 [6], Fire Services Act 1988 [7], Environmental Quality (Scheduled Waste) Regulations 2005

[8], Industry Code of Practice (ICOP) on Chemicals Classification and Hazard Communication (A) 2019 [9], OSH (Classification, Labelling, and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 [10], and Occupational Safety and Health Management Systems (ISO 45001:2018). This comparative regulatory analysis was aimed at evaluating the alignment of the checklist with established legal and procedural benchmarks and identifying areas of non-compliance or inadequacy across the ports. Finally, based on the findings, specific recommendations were developed to address the identified deficiencies and to enhance the practical applicability and effectiveness of the OSHWA checklist.

RESULTS AND DISCUSSION

Ports are high-risk areas due to the complex and dynamic nature of the activities within them. As hubs of global trade, they are critical points for goods, people, and machinery. However, the factors that make ports vital also contribute to their hazardous environments. It was overserved that the key risks include heavy machinery operations, cargo handling, and traffic management, all requiring stringent safety measures. Heavy machinery, such as cranes and forklifts, is essential for moving cargo but poses risks like collisions and mechanical failures. Cargo handling, especially with hazardous goods, demands care to avoid accidents like dropped loads or chemical spills. Traffic congestion, caused by poor management and limited space, increases the potential for collisions. These operational challenges make ports high-risk areas despite their importance in global commerce.

An assessment of Sarawak's ports provides a clear example of the risks and deficiencies present in such environments. Table 1 presents a comparative analysis of the OSHWA checklist with the observations made at Sarawak's ports. The assessment revealed several deficiencies in adherence to the OSHWA checklist, which expose the workers to considerable hazards, including chemical accidents and injuries. Among the most concerning issues were substandard housekeeping practices (Figure 1). Observations included chemical spillage (Figure 2), blocked exits, bird nests, rodent issues (Figure 3), and improperly disposed cigarette butts (Figure 4), all of which compromise safety.

Emergency preparedness also emerged as a critical concern. The absence of emergency signage, fire alarms (Figure 5), and sprinkler systems across Sarawak's ports indicates a failure to meet basic safety requirements. Furthermore, significant gaps were identified in the handling of hazardous chemicals and the readiness for emergency responses. Specific deficiencies included a lack of secondary containment for chemical storage, the unavailability of emergency response layouts, and the absence of policies or designated areas for smoking. It is important to have an early fire detection and notification with automated fire suppression and power shutdown, such a system can greatly reduce property damage and save lives [11].

Table 1. Analysis between OSHWA checklist and identified issues at Sarawak's ports

No	OSHWA		Issues observed at Sarawak's port			Related regulations	Deficiencies
	Section	Aspect	Port A	Port B	Port C		
1	A Hazardous chemical	Labelling	-	-	-	-	-
		Risk control	-	-	-	-	-
		Warning signage	-	-	-	-	-
		Storage	Eyewash and shower not function	No eyewash and shower	Eyewash and shower not function	ICOP on Chemicals Classification and Hazard Communication (A) 2019	-
			Insufficient fire extinguisher	Insufficient fire extinguisher	-	UBBL 2021	-
			No secondary containment	No secondary containment	No secondary containment	EQ (Schedule Waste) Regulation 2005	Requirement for secondary containment is not mention in

							OSHWA
			Damaged and insufficient signage	Damaged and insufficient signage	Damaged and insufficient signage	ICOP on Chemicals Classification and Hazard Communication (A) 2019	-
		Safety data sheet (SDS)	Not being display	Not being display	Not being display	OSH (Classification, Labelling, and Safety Data Sheet of Hazardous Chemicals) Regulations 2013	-
		Risk control	-	-	-	-	-
2	B Noise control	Warning signage	Damaged and insufficient signage	Damaged and insufficient signage	Damaged and insufficient signage	ICOP on Chemicals Classification and Hazard Communication (A) 2019	-
3	C Ergonomic	Employer identify the ergonomic issues	-	-	-	-	-
		Control measure	-	-	-	-	-
		Emergency signage and light	No emergency signage and light	No emergency signage and light	No emergency signage and light	UBBL 2021	Requirement for emergency signage and light is not mention in OSHWA
		Unobstructed way	Exits damaged and blocked	Exits damaged and blocked	-	UBBL 2021 Fire Services Act 1988	-
		Proper arrangement of items	-	-	-	-	-
		Designated working layout	Faded marking	Faded marking	Faded marking	UBBL 2021	-
		Working signage	-	-	-	-	-
		Good condition of floor, stair and rig	-	-	-	-	-
4	D Work area assessment	Closed open edge	-	-	-	-	-
		Hole and opening are closed and barricade	-	-	-	-	-
			Bird nest	Bird nest	Bird nest	OSHA (A) 2022	-
			Improper disposal of cigarette bud	Improper disposal of cigarette bud	Improper disposal of cigarette bud	Fire Services Act 1988	Designated smoking area is not mention in OSHWA
		Cleanliness and neatness of working area	Poor housekeeping	Poor housekeeping	-	OSHA (A) 2022	-
			Spillage	Spillage	-	ICOP on Chemicals Classification and Hazard Communication (A) 2019	-
		Risk control for working area more than 10ft high	-	-	-	-	-

		Risk control for work environment	-	-	-	-	-
5	E Heavy vehicle control	Risk control	-	-	-	-	-
		SOP	-	-	-	-	-
		Registration no for certified machinery	-	-	-	-	-
		Warning signage	Damaged and insufficient signage	Damaged and insufficient signage	Damaged and insufficient signage	ICOP on Chemicals Classification and Hazard Communication (A) 2019	-
		Electrical safety	Exposed and damaged panel box	Exposed and damaged panel box	-	Fire Safety Act 1988	-
6	F Welfare	Toilet facilities	-	-	-		-
		Rest room/ area	Poor housekeeping	Poor housekeeping	-	OSHA (A) 2022	-
		Clean water facilities	-	-	-	-	-
		Recreational and social facilities	-	-	-	-	-
7	G ERP	First aid box (FAB) & Fire suppression equipment	No FAB	No FAB	No FAB	UBBL 2021	-
			No emergency response (ER) layout	No emergency response layout	-	ISO 45001	Requirement to display ER layout is not mention in OSHWA
			Damaged fire alarm	No fire alarm	-	UBBL 2021	-
			Insufficient sprinkler	No sprinkler	-	UBBL 2021 UBBL 2021	-
			Insufficient fire extinguisher	Insufficient fire extinguisher	-	UBBL 2021	-
			No emergency signage and light	No emergency signage and light	No emergency signage and light	-	-
		Assembly point	-	-	-	-	-

Figure 1. Poor housekeeping practices

Figure 2. Leftover chemical spillage

Figure 3. Rodent issues

Figure 4. Improperly disposed cigarette butts

Figure 5. Damaged fire equipment (fire break glass)

Interviews with personnel working at selected ports in Sarawak highlighted several underlying challenges in implementing effective safety measures. Limited resources and organizational barriers were frequently cited as significant obstacles to maintaining comprehensive safety practices. In addressing these challenges, leadership plays a pivotal role in fostering a culture of safety within ports. Management commitment, in particular, is essential as it drives the implementation of effective safety systems and policies. Studies have consistently emphasized that management commitment is a key factor in reducing occupational accidents. For instance, research by Hong et al. (2018) [12] underscores how leadership's commitment to safety strategies can significantly lower accident rates. This aligns with the general leadership theory, where safety leadership is seen as a process of influencing all employees to actively pursue the safety goals of their organization [13; 14]. Furthermore, it was highlighted that management's commitment directly correlates with a reduction in occupational accidents, which emphasizing the importance of leadership in safety outcomes [15; 16].

However, despite the importance of leadership, another major issue identified through interviews was the inadequacy of training programs. While basic safety procedures were covered during onboarding, there was a notable lack of refresher training or more detailed sessions focused on specific activities or broader safety and environmental concerns. This gap highlights the need for management to prioritize employee training, consultation, and safety initiatives in order to strengthen the overall safety culture. Research has shown that mandatory training significantly improves workers' attention to personal safety, helping to reshape their attitudes towards safety behavior. It raises their awareness of the risks associated with their actions and reduces their willingness to accept unsafe practices. As emphasized by Tam and Fung [17] and Loosemore and Malouf [18], education and training not only decrease the likelihood of unsafe practices but also foster a stronger intention to avoid injuries. It is also supported by the study conducted by Evanoff et. al [19] and Jeschke et. al [20], their studies have shown that safety training can positively influence workers' behavior, helping them perform tasks more safely, reduce risk exposure, and ultimately lower the incidence of accidents.

RECOMMENDATION

Protecting the asset, employees, and members of the public from danger can be achieve by adopting and implementing a high-quality safety inspection checklist. It will also help to protect the property and reputation. OSHWA checklist is an excellent checklist but there is area for improvement toward a comprehensive safety measure in the premises. Thus, the following recommendations are proposed.

First, a revision of the OSHWA checklist is necessary. The identified inadequacies should be officially communicated to the Department of Occupational Safety and Health (DOSH), leading to an updated checklist that includes detailed requirements for secondary containment, designated smoking areas, fire suppression systems, and emergency response layouts. The revised checklist should also mandate regular inspection and maintenance schedules for all safety equipment.

Secondly, ongoing training and awareness initiatives should be introduced. Premises are encouraged to implement continuous safety education and awareness campaigns for port workers and supervisors. These efforts will reinforce the importance of adhering to safety protocols and maintaining a clean, safe working environment.

Third, infrastructure maintenance must be prioritized. This includes investing in the upkeep and upgrading of safety infrastructure such as emergency lighting, sprinkler systems, eyewash and shower stations, and fire extinguishers. A routine inspection schedule should be established to monitor the condition and functionality of these safety assets.

In addition, an adequacy assessment of the OSHWA checklist should be extended to other industries such as manufacturing, construction, and agriculture. This broader evaluation will help enhance the checklist's coverage and effectiveness across different work environments.

Finally, a comprehensive study on bird nest control measures is recommended. This issue has been consistently observed at all ports and presents ongoing safety and hygiene challenges that need to be addressed systematically.

CONCLUSION

This study identifies critical gaps in the implementation of the OSHWA checklist at ports in Sarawak, especially in hazardous chemical handling, emergency preparedness, equipment maintenance, and housekeeping practices. These shortcomings not only pose substantial risks to worker safety but also reflect inconsistencies with regulatory compliance. The research provides new insights by directly comparing observed safety practices with checklist requirements and national regulations, revealing specific areas where the current checklist is inadequate. Key contributions of this work include evidence-based recommendations to revise the OSHWA checklist, which has remained unchanged since 2005. Given the evolving industrial landscape and regulatory standards, an update is crucial to ensure relevance and effectiveness. The proposed enhancements incorporate critical requirements such as the implementation of secondary containment systems, establishment of designated smoking areas, integration of effective fire suppression mechanisms, and the development of clearer, more comprehensive emergency response protocols. Furthermore, the study underscores the importance of continuous training, increased safety awareness, and infrastructure improvements. By addressing these issues, the findings offer a valuable foundation for DOSH to enhance safety standards at Sarawak's ports and serve as a model for improving workplace safety in other high-risk industries.

ACKNOLEDGEMENT

The authors would like to thank University of Technology Sarawak (UTS) for funding this work under an internal grant (1/2024/20).

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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