

Disaster preparedness in major hazard installation: Issues and challenges from the perspective of enforcement officers

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ABSTRACT – Major hazard industry is considered to be one of the sectors with a high potential for disaster occurrence. Disaster preparedness activities are crucial to ensure major hazard installations are in the state of readiness in the event of disaster. To regulate preparedness, CIMAH Regulations has been in gazette since 1996 by the Malaysian government. The regulations provide minimum requirements for major hazard industries to comply with regards to disaster management planning and activities. However, after more than two decades of being enforced, there has been no study conducted to explore the issues and challenges related to CIMAH compliance, particularly on the topic of disaster preparedness activities from the perspective of enforcement officers. This study sought to explore the experiences of auditors or enforcement officers regarding the disaster preparedness process and activities in major hazard installations. The study used a qualitative design, specifically utilizing semi-structured interviews. There were three experienced enforcement officers interviewed. The findings showed five issues and twenty-eight challenges in preparedness activities from the enforcement officer viewpoint. The human capital issues have the largest number of challenges facing by MHI.

1. INTRODUCTION

Major Hazard Installation (MHI) is an organization that has a higher likelihood to be involved in industrial disasters due to the use or storage of specific major hazard chemicals in their facilities [1]. In 2016 there were a total of 315 MHIs identified throughout Malaysia [2]. The Control of Industrial Major Accident Hazard (CIMAH) Regulation, 1996 was formulated to regulate the control and mitigation activities related to major hazard disaster. The Department of Occupational Safety and Health (DOSH), under the Ministry of Human Resources is responsible for enforcing this law. Accordingly, enforcement officers from the Major Hazard Division are tasked to conduct regulatory activities. This includes reviews of reports prepared by MHI, conducting an MHI audit, becoming independent observers in the MHI's preparedness programmes and become prosecutors whenever CIMAH non-compliance arises.

Disaster preparedness activity is one of the components in the enforcement scope under the CIMAH Regulations. The preparedness activities and initiatives by MHIs are to be monitored and examined by DOSH's enforcement officers through a field audit assessment. The extensive experiences of these enforcement officers that have not been documented become the motivation of this study. The aim of this study to explore MHI's the issues and challenges in disaster preparedness during of DOSH enforcement officers audit activities.

2. METHODOLOGY

To obtain qualitative data, in-depth interviews were conducted to tap on the perspective of three DOSH enforcement officers related to disaster preparedness activities implemented by the MHIs. The inclusion criteria for interview candidates are; (1) have a professional experience of more than 5 years in CIMAH enforcement activities, (2) holds at least a bachelor degree, (3) have reviewed more than 50 safety case reports and (4) have conducted more than 50 major hazard audits to MHIs.

A semi-structured interview guideline was utilized throughout the data collection process. The question starts with the enforcement officers' definition of disaster preparedness. The interview questions then followed the themes stated in the disaster preparedness management cycle [3]. The semi-structured format allows the researcher to add questions during the interview to explore another topic that seemed relevant. Interviews were recorded and transcribed.

The method of analysis applied was a qualitative analysis approach. Data collected from the transcript were extracted and organized based upon frequently discussed themes and issues. Atlas.ti software was used to code the extracted issues and themes.

3. RESULTS & DISCUSSION

Three officers were interviewed in March 2019. They are identified as officer P1, P2 and P3. The P1 and P3 officers are male, and officer P2 is female. The interview lasted between 30 and 57 minutes with mean 45 minutes. The mean age of study participants was 33 years old, ranging from 30 to 35. Officers P1 and P2 have served in the role of CIMAH enforcement team for more than 10 years while officer P3 has served for 6

years. Both officers P1 and P2 held a master degree in process loss control management, while officer P3 held a bachelor degree in engineering.

From the perspective of DOSH’s enforcement officers, there were a total of five issues and twenty-eight challenges captured, concerning disaster preparedness activities among MHIs. Table 1 summarizes the interview findings.

Table 1: Issues and challenges of disaster preparedness implementation in major hazard industries

Issues	MHI Challenges
Preparedness Budget	1. No allocation or budget for preparedness emergency equipment
	2. Fail to perform emergency equipment maintenance activities
	3. Fail to perform engineering control measures from previously identified risks
	4. Limited budget to conduct emergency preparedness training
Emergency Exercise	5. Have not performed any emergency exercise
	6. The emergency exercise conducted only through paper-based simulation or discussion
	7. Emergency exercise does not include contextual and realistic scenarios
	8. Lack of cooperation among workforces during an emergency exercise
	9. Poor response time during an emergency exercise
Emergency Equipment	10. Inadequate emergency equipment
	11. Emergency equipment that has already been expired
	12. Inadequate personal protective devices provided
	13. Personal protective devices provided are not suitable / does not fit to ERT
	14. Outdated emergency equipment technology provided
	15. ERT is not competent enough to use emergency equipment
Human Capital	16. No focal person assigned to coordinate response activities
	17. Inadequate workforce to provide efficient response
	18. No back-up personnel assigned to support response coordination activities, if the focal person is not available
	19. Poor voluntary participation and involvement of the workforce as ERT members
	20. Poor ERT commitment to ensure proper implementation of preparedness programmes and activities
	21. Ambiguous ERT roles and responsibilities
	22. Ignorance and unawareness of the general workforce related to preparedness and responses
	23. A sizeable proportion of general workforces consisted of individuals

Issues	MHI Challenges
	with low education level
Emergency Preparedness Training	24. Inadequate training implementation efforts
	25. Inadequate monitoring of training quality
	26. Training contents that are not tailored to specific MHI’s work contexts and requirements
	27. Training conducted just to meet law requirement, without proper planning
	28. Management did not approve training due to its effect on production outputs

Notes: ERT – emergency response team

Preparing an emergency response plan is one of the main elements in disaster preparedness management [4]. Some of the issues and challenges found in this study can be used in the future as measurement indicators for disaster preparedness or readiness level for major hazard industries.

4. CONCLUSIONS

Disaster preparedness activities are critical to ensure that MHIs are in the state of readiness to respond to major disaster occurrence adequately. Findings from DOSH’s enforcement officers on the implementation challenges in Malaysian MHIs revealed a total of five main issues: (1) preparedness budget, (2) emergency equipment, (3) emergency exercise, (4) human capital and (5) emergency training. Each issue has its challenges, in which a total of twenty-eight challenges has been extracted from the study. The findings provide a general overview of preparedness issues and challenges among MHIs, with regards to CIMAH regulations compliance.

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