

EFFECT OF TRAINING ON HAZARD PREVENTION ON PERFORMANCE OF CEMENT MANUFACTURING FIRMS IN KENYA

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CITATION: Mwaruta, S., S., Karanja, P., N., & Kamaara, M. (2019). Effect of Training on Hazard Prevention on Performance of Cement Manufacturing Firms in Kenya. *Journal of Social Science and Humanities Research*

Abstract: This study sought to find out the effect of hazard prevention training on the performance of cement manufacturing companies in Kenya. Manufacturing firms are spending a lot of money to take care of their workers' absenteeism and compensation which is caused by occupational accidents. It has been argued that lack of hazard prevention training has majorly contributed to the continued losses to the companies due to occupational accidents among the employees. It therefore becomes necessary to assess the effect of hazard prevention training on the performance of manufacturing companies in the cement sub-sector in Kenya. The study adopted the descriptive research design which used both quantitative and qualitative approach to determine the relationship between employee training and Performance of Cement Manufacturing firms in Kenya. The study adopted a sampling formula to identify 344 as the appropriate sample size and the respondents were picked through stratified random sampling. Data was collected using a structured questionnaire for employees that had both open-ended and close-ended questions. Hypotheses were tested using linear regression, multiple regression analysis. The study established that hazard prevention training had significant and positive effect on performance of cement manufacturing firms in Kenya. The study also established that management styles had significant moderating effect on the relationship between hazard prevention training and performance of cement manufacturing firms in Kenya. The study concluded that as a result of hazard prevention training, the awareness on how to prevent hazard was enhanced thus preventing occupational accidents and promoting employee productivity. The study recommended that there was considerable need to provide training on need hazard prevention to the employees so as to avoid work-related accidents and promote performance.

Keywords: Hazard Prevention, Training, Management Style, firm Performance and Cement Manufacturing Firms and Occupational Health and Safety.

1. INTRODUCTION

Background of the Study

In the current 21st century, Human Resource is turning to be a central aspect on the organizational performance and competitiveness. The skills, competencies and physical well-ness of employees determine the extent to which an organization is able to meet its mandate and stand a chance to compete with its peers. Health and safety training stand to be among the major areas of focus in promoting the wellness and physical fitness of the employees to perform their mandate. One of the aspects of Occupational health is the training on hazard prevention. In the modern business World,

there are numerous hazards and safety risks facing employees at the workplace. Providing the necessary information on these hazards through training to the workers is therefore a good motive towards enhancing their productivity and effectiveness (ILO, 2013). Safety and health training is key part of the preventive programme in any organization and that it should start as part of the induction course and should also take place following a transfer to a new job or a change in working methods (Armstrong & Taylor, 2014).

Hazard prevention should be a function of safety precautions and ultimately performance of the firm (Isik & Atasoylu, 2017). Occupational Safety and Health training has been associated with hazard prevention and control. When organizations have adequate safety materials as well as personal protective equipment, then they are likely to reduce the number of incidents and accidents at workplace (Podgorski, 2015). It is expected that Occupational Safety and Health training has an effect on hazard prevention that translates to changes in the performance of the organization.

Ways and methods of hazard prevention should be emphasized when training employees on hazard prevention and control. Training employees on Hazard prevention helps in averting work injuries through using the recommended hierarchy of control whereby the control is participative with workers engaged in providing insights on how to prevent hazards. The participative nature, the communication and engagement of workers should be able to aid in developing knowledge, instilling attitude and promoting practices geared towards protecting workers and minimizing occupational incidences.

Monitoring the prevention measures put on the day to day operations of the firm is critical in enhancing the idea of prevention. Appropriateness is another aspect that has been pointed out as far as hazard prevention is concerned. The measures put to prevent risks ought to be appropriate so as to avoid mistakes that could worsen the problem. Prevention of hazards takes a multi-faceted approach where the staff, the management and other stakeholders observe actions and incidents that when implemented can have a change on overall productivity of the firm (Podgorski, 2015).

Among the main sectors where occupational accidents are peculiar is the manufacturing sector. This is a sector where despite the continued automation of processes through adoption of machinery and technology, a lot of manpower and physical activities are involved. Cement manufacturing sub-sector for instance is involved with processes that affect the employee health to a great extent. It therefore becomes imperative to enhance employee safety and above all uphold training on prevention of hazards and other work-related risks.

Statement of the Problem

As reported by the World Health Organization (2013) estimates that over 160 million of new cases of work related illnesses occur every year while the International Labour Organization (ILO) estimates that 2.2 million workers die every year as a result of work related ill-health and injury and 350 thousand of these deaths are due to occupational illnesses and accidents. Most organizations are spending a lot of time and money on health and safety of their employees, yet occupational accidents which results into absenteeism and financial costs have continued to increase especially among the manufacturing firms (Klynveld Peat Marwick Goerdeler-KPMG, 2016). According to Robbins, De Cenzo and Coulter (2015), since 2002, health costs had risen to an average of 15% a year and were expected to double by the year 2016 from \$2.2 trillion spent in 2007. In addition, the time lost and the financial implications accrued due to the occupational accidents added to the operational costs of the manufacturing firms (Zhao et al, 2016). It was further remarked that most of the industrial accidents happening in Kenya were related to lack of training and adherence to the OSHA regulations (Otieno, 2012; Makori, Nandi, Thuo, & Wanyonyi, 2012). It is believed that raising awareness on how to avoid and prevent some hazards plays a key role in reducing the occupational accidents but very scant literature exists to support this. This paper therefore sought to fill the existing gaps by addressing the effect of hazard prevention training on the performance of cement manufacturing firms in Kenya.

Objectives

- i. To determine the effect of hazard prevention on performance of cement manufacturing companies in Kenya.
- ii. To examine the moderating effect of management styles on the relationship between hazard prevention training and performance of cement manufacturing companies in Kenya.

Research Hypotheses

- i. **H_{a3}**: Hazard prevention has a significant effect on Performance of cement manufacturing firms in Kenya.
- ii. **H_{a5}**: There is significant moderating effect of management styles on the relationship between hazard prevention training and performance of cement manufacturing companies in Kenya.

2. LITERATURE REVIEW

Theoretical Review

Epidemiological Theory

The epidemiological theory was pioneered by Iskrant (1962) in an attempt to address the casual relationship between diseases or occupational incidents and environmental factors. The model thus indicates that the environment of the workers has a significant relationship with the rate and probability of occurrences of accidents and incidents (Robertson, 2015). The epidemiological theory asserts that there are two characteristics associated with workers that can lead to occupational accidents. The two include situational and predisposed characteristics that could either cause or prevent incident/accident conditions. The predisposed characteristics included perceptions, environmental factors and susceptibility of the workers. Their perceptions and susceptibility could be improved through performing safety training and ensuring strong adherence to the safety guidelines. Situational characteristics included peer pressure at work, attitudes of workers and priorities of the supervisor (Robertson, 2015).

The Contingency Theory

The contingency theory asserts that management problems are different under different situations and require to be tackled as per the demand of the situation. The Contingency Approach recognized that all business situations were different and that each event comes with its own set of problems, challenges and internal and external environmental factors. On the off chance that administration is adaptable, at that point the executives can react to every one of these variables and act in like manner. Strikingly, investigations of organizations that work in unsure situations are progressively fruitful with an adaptable way to deal with the executives, while organizations in an increasingly steady condition improve an increasingly inflexible and organized administration style of activities. In order to determine the most effective management approach, each situation had to be evaluated separately to determine how best to apply any individual management theory.

Conceptual Framework

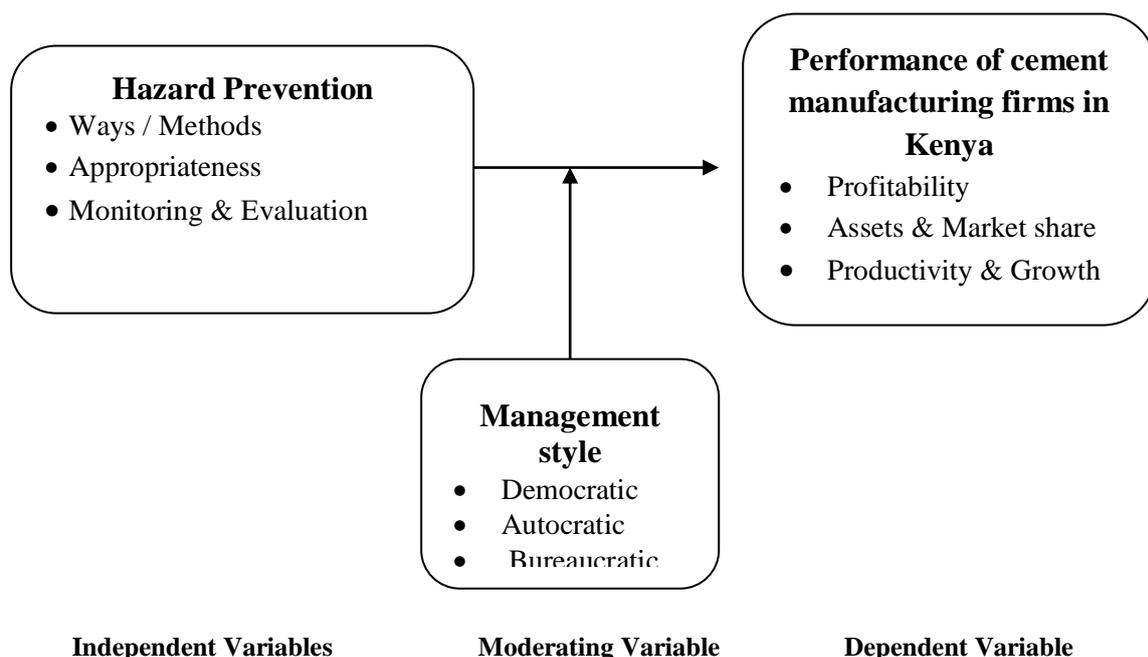


Figure 1: Conceptual framework

Empirical Literature Review

A study by Yu, Li, Qiu, Wan, Xie, & Wang (2017) on the effectiveness of participatory training in preventing accidental occupational injuries identified identification as well as control of such hazards as key in reducing the number of incidents and accidents at an organization, an action which had a positive effect on the overall firm productivity. According to Armstrong and Taylor (2014) hazard prevention and control includes the following actions: identifying the causes of accidents and the conditions under which they are most likely to occur. Taking account of safety factors at the design stage – build safety into the system. Designing safety equipment and protective devices and providing protective clothing. Carrying out regular risk assessment audits, inspections and checks and taking action to eliminate risks.

Leigh (2011) indicates that management should be committed to implementing effective health and safety programs. The management should have activities that lead workers and other stakeholders in identifying the importance of adhering to the OSHA recommended practices. There should be a culture that ensures health and safety practices are implemented and adhered to, throughout the operations of the organization. When the organization visibly demonstrates and communicates its commitment to workers' health and safety, then workers would adopt the OSH practices, participate in their implementation and improve their OSH KAPs thus leading to reduced occupational accidents. The management should also fully commit to eliminating hazards, protecting workers and continuously improving the workplace to ensure it is safe. The management should act as an example in adherence to the OSH recommended practices.

Sinclair and Cunningham (2014) conducted a study that examined predictors of safety activities among producing industry. The study found out that where owners of small businesses identified hazards there were higher chances of initiating hazard control measures that further reduced the cases of occupational incidences. The authors also argued that more workplace injuries were experienced in smaller firms as compared to larger firms. A limitation of the study is that the predictors of safety activities were infrequently studied. The study involved 722 respondents where they found that safety activities kept increasing in technology, new education and new methods. Among the predictors that were identified for identifying hazards in the study was having a previous inspection program for the safety of the organization.

Abrahamsen, Asche, and Milazzo (2013) while studying on an evaluation of the effects of using safety standards in hazard industries argued that employees who were sampled, agreed that having general understanding about safety standards had capacity to improving safety. The study refutes the opinion that using safety standards is not always as expected. The study also indicated that having safety standards designed and implemented had capacity of reducing investments in compensations and other adverse effects that further negatively affect the organization. The study concludes by urging stricter safety standards that could lead to overall safety improvement.

Reynolds, Douphrate, Hagevoort, Brazile, and Root (2013) focused on managing worker safety, productivity as well as regulatory issues where the authors argued that creating awareness and overseeing compliance to the set rules is key in ensuring proper implementation. The authors indicated that organizations need to adopt an effective safety-specific transformational leadership that could help in ensuring identified programs were implemented strictly. Proper management and leadership of teams in realizing the importance of adopting OSH programs and implementing them to the latter. Appropriate management styles would address the issues of workers' health and safety as they form some of the critical assets an organization could use to achieve its goals. Visionary, innovative, responsive and flexible management is recommended for ensuring high good performance at the cement manufacturing firms in Kenya.

3. METHODOLOGY

The study adopted descriptive research design which used both quantitative and qualitative approach to determine the relationship between employee safety and health training and performance of cement manufacturing firms in Kenya. Descriptive research design involves measuring a set of variables as they exist naturally (Gravetter & Forzano, 2011). Qualitative and quantitative approaches were therefore adopted by this study because qualitative data provided detailed answers and quantitative approach emphasized measurement whereby data was analyzed in a numerical form to give precise description.

The target population for this study was six (6) licensed cement manufacturing firms in Kenya (Economic Survey, 2015). Out of the six cement manufacturing firms, one cement manufacturing firm was used for piloting purposes. The target population had heterogeneous characteristics because it consisted of the cement manufacturing firms that dealt with

employees in human resource department, production department and marketing department. These employees thus formed the units of analysis.

Purposive random sampling method was used to select a sample of the six cement manufacturing firms in Kenya according to the market share. The sample size was drawn from 2500 employees of the five cement manufacturing firms. The study adopted the simplified sample size formula by Yamane (1967) which is expressed mathematically as follows:

$$n = \frac{N}{1 + Ne^2}$$

Where

n = Sample size

N = Target population

e = maximum acceptable margin of error (5%).

$$n = \frac{2500}{1 + 2500 (0.05)^2}$$

$$n = 344 \text{ (sample size)}$$

The total number of respondents was 344 as selected across the three departments within the five firms. This is around 14% of the total population of employees in the six licensed cement manufacturing firms in Kenya.

Primary data was collected using a questionnaire that was designed with both structured and unstructured questions and an interview guide for the Human Resource and Safety/Production managers. Questionnaires were administered by the researcher with the help of three research assistants.

Data was analyzed mainly by use of frequencies, descriptive and inferential statistics. Descriptive statistics included percentages, mean and standard deviation. Inferential statistical techniques included correlation and regression analysis which were used to draw a causal relationship between the hazard prevention training and the performance of cement manufacturing firms in Kenya. The regression model adopted was as follows:-

$$Y = \beta_0 + \beta_1 X_1 + e \quad \text{where:}$$

Y = represents the dependent variable, performance of cement manufacturing firms in Kenya

β_0 = the Constant

β_1 = the coefficient for the independent variable

X_1 = hazard prevention

e = error term

Moderating effect:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 Z + \beta_3 X_1 Z + e$$

Where:

Z = the moderator (Management styles)

e = error term

4. FINDINGS

Response Rate

The overall response rate for the study was 96% indicating that only a few questionnaires were returned unfilled, that is, 96% which was composed of 330 positive responses on questionnaires out of the targeted 344.

Results of Descriptive Analysis

Hazard Prevention

The findings as shown in Table 1 imply that through hazard prevention, the employees get more time to focus on the operations of the firm hence promote the firm performance. The findings concur with those by Yu *et al.* (2017) who found that effective participatory training in preventing accidental occupational injuries led to increased identification as well as control of such hazards as key in reducing the number of incidents and accidents at an organization, an action which had a positive effect on the overall firm productivity. Keane (2015) also supported the assertion that training workers on safety practices had an impact on reducing losses at organizational level. Keane further asserted that there was need to change OSH paradigms and practices in a bid to influence reduction in occupational accidents.

When organizations have adequate safety materials as well as personal protective equipment, then they are likely to reduce the number of accidents at workplace (Podgórski, 2015). It is expected that OSH training has an effect on hazard prevention and control that translates to changes in performance of Kenyan cement manufacturing companies. Observing and assessment of OSH projects is related with improved OSH preparing content. Through grasping solid checking and assessment of word related wellbeing and wellbeing programs, the administration is able to identify areas that were not done according to the set procedures and set expectations. Effectiveness of any OSH program depends on how the management implements it and allows the workers to view their opinions on the success or failure of previous programs (Podgórski, 2015).

Table 1: Descriptive Statistics on Hazard Prevention

Measurement Aspect	Mean	Std. Dev.
The organization should conduct monitoring and evaluation of OSH programs	3.86	0.73
The organization performs frequent checks on safety preparedness(like twice or thrice a year)	3.91	0.68
Different and unique techniques are applied by the organization to ensure hazard prevention and control	3.84	0.75
Our organization has embraced change of focus on OSH training to enhance its effectiveness	4.01	0.49
I am satisfied in all preparedness, implementation and monitoring of OSH training programs	2.31	1.08
The organization has adequate safety materials and personal protective equipment	2.86	0.93
The reduction of working hours has an impact on the number and trends of incidents and accidents at the organization	3.86	0.73
Overall, embracing hazard implementation and control has an impact on the number of accidents	3.91	0.68
OSH training should come along with rewards and recommendations to ensure employees' motivation and adherence.	3.93	0.91
OSH training of employees on hazard prevention has helped in averting work injuries in your firm.	3.91	0.84
Average	3.64	0.78

Management Styles

The management style has been associated with enabling the adoption of workplace measures to control occupational incidents and accidents (Boustras et al., 2015). The respondents were asked to indicate their levels of agreement with various statements on management styles based on a five-point Likert's scale. The findings are as shown in Table 2. The findings compare with those by Athey (2015) who established that the management styles used by the organizational management to integrate the OSH aspects in the organizational mainstream explained the level at which the aspect was embraced. Through proper communication and seeking opinion of the employees as some of the best management styles, the entire organizational community aligns into embracing the OSH training thus making the implementation of the entire process and its contribution to firm performance viable (Reynolds et al., 2013).

Table 2: Descriptive statistics on Management Style

Statement	Mean	Std. Dev.
Communication between senior management and other employees impact on the number of incidents and accidents	4.13	0.76
The management involves staff/workers in planning on OSH training, selection of safety and health topics to be covered	3.79	0.94
In case of incidents and accidents, the management has well-coordinated structures that help in reducing the magnitude of damage	3.48	1.05
The management focuses on frequent OSH training on all staff	2.09	1.33
The management trains new staff on their roles and safety practices before starting working	3.86	0.96
The management rewards staff, groups and departments that show high degree of OSH preparedness and OSH practices	3.71	0.99
The staff have conducive working environment as facilitated by the management	3.94	0.98
Management of your firm through OSH training has ensured that employees feel valued	2.68	1.33
Average	3.57	1.00

Performance of Cement manufacturing firms

Performance of cement manufacturing firms in Kenya, being the dependent variable, was measured by eight items that were closely associated with organizations output and the ability to generate positive changes after implementing OSH training programs (Gopang, Nebhwani, Khatri & Marri, 2017). The findings as shown in Table 3 concur with the arguments by Petersen (1984) in the human factor theory that employees turn to be more productive when they are free from accidents related to their daily duties which is ensured by training and creating awareness on how to avoid such accidents. Moreover, Menger *et al.* (2016) contend that through occupational health training, the confidence among the workers is enhanced and this contributes to the increased productivity thus promoting firm performance. The findings also compare with those by Granerud and Rocha (2011) who found that for a manufacturing sector to achieve the best out of the employees, occupational health and safety training was necessary such that they (employees) are aware of the dangers they might encounter while working and how they could avoid or prevent such occurrences.

Table 3: Descriptive Statistics on Firm Performance

Measurement Aspect	Mean	Std. Dev.
There is increase in production after OSH training associated with motivated staff	3.86	0.73
OSH training has led to reduced incidents and absenteeism thus influencing firm productivity	3.84	0.75
OSH training leads to better preparedness that translates to fewer incidents and saving on medical costs	3.91	0.88
OSH training at the firm has increased hazard identification and leading to improved working conditions	3.77	1.03
OSH training has increased workers' participation enabling efficient production processes	3.96	0.91
OSH training and hazard prevention has led to improved production and overall firm performance	3.77	1.00
Management style on OSH training and staff handling is associated with changes in production and ultimately firm performance	3.75	1.01
Overall, OSH training at this organization can be associated with changes in firm performance	3.91	0.68
OSH training has potential impact on performance of a firm since training builds strong, proficient and qualified personnel.	3.91	0.78
Training staff frequently on the occupational safety and health has ensured that the bulging cases of occupational accidents are minimized and in some cases eliminated.	3.86	0.73
OSH training has opened up opportunities for employees to master new operations and give the firm an advantage in improving operational efficiency.	3.86	0.73
Average	3.85	0.83

Inferential Analysis

The Regression was conducted using a simple regression analysis which involved running the least square regression method and interpreting the R^2 values, F values and coefficients.

Hazard Prevention and Firm Performance

Model summary, ANOVA and regression coefficients were used to test for the hypothesis and exemplify the statistical relationship between hazard prevention and performance cement manufacturing companies in Kenya. The model summary findings as shown in Table 4a revealed that the R^2 for the model was 0.681 which implies that hazard prevention explained up to 68.1% of the variation of performance of cement manufacturing firms in Kenya. On the other hand, the ANOVA results on Table 4b indicated that the model had an F-calculated of 9.708 at a significance level of $0.003 < 0.05$.

This implies that the model is statistically significant and that hazard prevention can statistically explain the performance of cement manufacturing companies in Kenya. The regression coefficients on Table 4c revealed that hazard prevention had a significant and positive influence on the performance of cement manufacturing companies in Kenya ($\beta = 0.711$ & P-value = $0.000 < 0.05$). The findings imply that a unit change in hazard prevention can explain up to 71.1% of performance of cement manufacturing companies in Kenya. This therefore justifies the decision to accept the alternative hypothesis that hazard prevention significantly and positively influences the performance of cement manufacturing companies in Kenya. According to Yu *et al.* (2017), hazard prevention implies that the organization is ready to counter the occupational accidents and this gives the employees courage and commitment to perform their duties effectively thus promoting firm performance.

Table 4a: Model Summary on Hazard Prevention

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.825 ^a	.681	.513	.133

a. Predictors: (Constant), Hazard prevention and control

Table 4b: ANOVA Results on Hazard Prevention

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.821	1	1.821	9.708	.000 ^b
	Residual	15.381	329	.188		
	Total	17.202	330			

a. Dependent Variable: Performance of cement manufacturing firms

b. Predictors: (Constant), Hazard prevention and control

Table 4c: Regression Coefficients on Hazard Prevention

Regression Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error			
1	(Constant)	2.916	.264		11.039	.000
	Hazard prevention and control	.711	.065	.825	10.938	.000

a. Dependent Variable: Performance of cement manufacturing firms in Kenya

Moderated Effect of Management Styles

The study sought to find out the moderating effect of management style on the relationship between hazard prevention training and performance of cement manufacturing firms in Kenya. The results as shown in Table 5 reveal that there is a significant and positive moderating effect of management styles on the relationship between hazard prevention training and Performance of cement manufacturing companies in Kenya.

Table 5: Regression Coefficients (Moderated Model)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.702	.057		64.924	.000
Hazard prevention_Moderator	.213	.059	.139	1.746	.002

a. Dependent Variable: Performance of cement manufacturing companies

5. CONCLUSION

The study sought to assess the effect of hazard prevention training on performance of cement manufacturing companies in Kenya. The study established that hazard prevention training enhanced the awareness and application of methods to avoid and prevent hazards thus reducing the occupational accidents and enhancing the productivity of the employees. This as a result enhanced the performance of cement manufacturing firms. The study concluded that hazard prevention translated to reduced number of incidents and accidents. Prevention of accidents was determined by frequent monitoring and evaluation of the OHS programs, performing frequent checks on safety preparedness and applying different techniques in performing OSH trainings. Management style was found to influence how organizations adopted hazard prevention training thus playing a moderating effect on the relationship between hazard prevention training and performance of cement manufacturing firms in Kenya.

6. RECOMMENDATIONS

From the study findings, it is recommended that the management of cement manufacturing firms ought to uphold hazard prevention training so as to prevent occurrence of hazards that affect the health and physical wellness of their employees. This will enhance employee productivity thus translating to enhanced firm performance. The management should ensure frequent checks on safety preparedness across all the sections of the organization, using different techniques on prevention of hazards and regularly changing the focus of OSH training to the key areas that seem to be mostly affected by occupational accidents and incidents.

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