Academic Scholars Publishing League (ASPL)
International Journal of Management Sciences
ISSN: 2360-9944 | Volume 12, Issue 1 | January, 2024| pages 48 – 60
DOI: 277514562112012
arcnjournals@gmail.com
https://arcnjournals.org

Workplace Hazard Identification and Organizational Performance in the International Oil and Gas Companies in Nigeria

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Abstract: *One of the challenges that stand on the way of organizations from performing optimally, is its inability to identify and assess workplace risks. This study examined the relationship between workplace hazard identification and organizational performance of international oil and gas companies in Nigeria. The study adopted the cross-sectional survey in its investigation of the variables. Primary source of data was generated through structured questionnaire. The population for the study was five (5) international oil and gas companies in Nigeria according to the website of the Department of Petroleum Resources (2019). Since the population was small, the entire population of five (5) international oil and gas companies in Nigeria were used as a census. However, for the purpose of data collection, fifty (50) managers were used. The hypotheses were tested using the Spearman's Rank Order Correlation Coefficient. The tests were carried out at a 0.05 significance level. Findings from the study revealed that there is a significant relationship between workplace hazard identification and organizational performance of international oil and gas companies in Nigeria. The study concludes that workplace hazard identification significantly relates with organizational performance of international oil and gas companies in Nigeria. Therefore, the study recommends that international oil and gas companies should have well-structured policies and have a mechanism to enforce these policies so that employees can be able to comply with and ensure work safety is adhered to.*

Keywords: *Workplace Hazard Identification, Organizational Performance.*

INTRODUCTION

Organizations around the globe are in a continuous dilemma of maintaining business performance. Most business organization managers around the world find it difficult to constantly achieve targeted business performance due to the dynamic nature, open market competition and globalization characterized with the 21st-century industry. Firms in different industries around the world have experienced unstable performance, seemingly uncertain on strategies to employ in reacting to flexible policies, and unstable performance arising from challenges in the local and international business contexts (Arokodare & Asikhia, 2020).

The Oil and Gas industry is a major contributor to the Nigeria economy. It accounts for about 90% of the federal government's annuals revenue. This industry which is dominated by foreign interests and major activities like exploration, drilling, production; well intervention and servicing

provision remain primarily controlled by IOCs, NOCs, and local contractors. According to an IEA report on energy consumption in 2010, oil and gas provides the world's population of about 6.9 billion people with 90% of their daily energy need. Despite the huge benefits this industry brings to society, it has been noted to be an industry characterized by complex exploration and production processes, which if not well managed, could lead to disasters. Considering the nature of the Oil and Gas industry and the complex processes involved in its operation, it is a high risk industry.

Workplace hazards can result in fatal accidents, damage to machines and equipment and loss of productivity. Such industrial accidents with adverse consequences can result in fatalities and disabilities. In the study of Afube, Ify and Ugbebor (2019) they reported that approximately 3,183 injuries occurred in Nigerian factories between 1987 and 1996, out of which about 2.2% was fatal. The chemical industry was said to account for 9.8% of the death of workers within this period. The hazards of high noise levels, explosion and working at heights have been found to be among the major causes of injuries and deaths in chemical industry in Nigeria (Adhikari, 2018; Agba, Ushie, Abam, Agba & Okoro 2010; Ahmed, Dosoki & Nasr, 2010).

Most similar studies have focused on occupational safety and health practices and performance/productivity of the organization, and their findings have established that occupational health and safety enhances organizational performance. However, there is little empirical studies conducted on occupational hazard management and organizational performance. It is at this point that this study departs from previous studies by examining the relationship the relationship between occupational hazard management and organizational performance of international oil and gas companies in Nigeria. This study as its point of departure from similar studies examined the relationship between workplace hazard identification and organizational performance of international oil and gas companies in Nigeria

This paper was guided by the following research question:

i. What is the relationship between workplace hazard identification and product/service quality of international oil and gas companies in Nigeria?
ii. What is the relationship between workplace hazard identification and innovativeness of international oil and gas companies in Nigeria?
iii. What is the relationship between workplace hazard identification and timely delivery of international oil and gas companies in Nigeria?

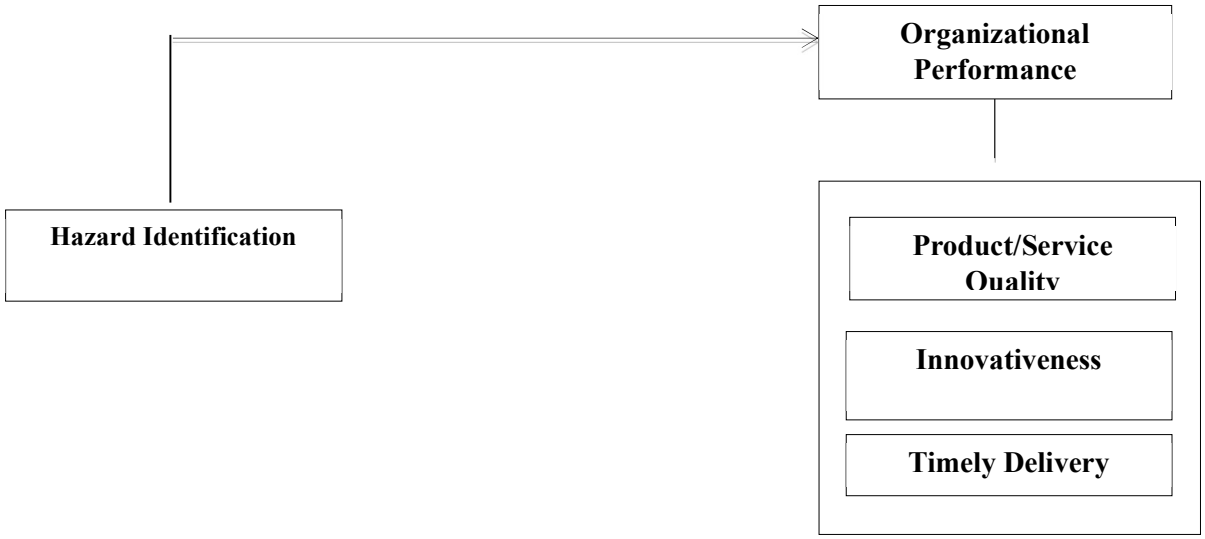

Fig.1 Conceptual framework for workplace hazard identification and organizational performance

Source: Desk Research (2023)

LITERATURE REVIEW

Theoretical Foundation

Heinrich's Domino Accident Causation Theory

Heinrich (1931) was the pioneer of the accident causation theories. He described the accidents causation theory in the form of man and machine relationship, frequency and severity relation, unsafe acts reasons, management role in accident prevention, costs of accidents and the impact of safety on efficiency (Philip, Montgomery & O'Reilly, 2001). The Heinrich's domino theory is comprised of five standing dominos which will fall one after the other if the first domino (ancestry and social environment) falls. The accident can be prevented only if the chain of sequence is disturbed, for example the unsafe act/condition can be eliminated in order to prevent the accidents and associated injuries. Heinrich efforts on accident causation theory can be summed up into two points, people (human) who are the main reasons of accidents and management which has the responsibility of preventing the accidents (having the power and authority) (Jhamb & Jhamb, 2003).

According to Taylor, Easter and Hegney (2004), Heinrich (1931) established the 'Domino theory' which is based on five sequential factors as following: The first domino was ancestry and social environment; Ancestry and social environment are the process of acquiring knowledge of customs and skills in the workplace. Lack of skills and knowledge of performing tasks, inappropriate social and environmental conditions will lead to fault of person. Heinrich (1931) explained that undesirable personality traits such as stubbornness and recklessness can be

passed along through inheritance or developed from people's social environment that this contributes to the faults of person. The second domino is the fault of person (carelessness); Faults of person or carelessness are negative features of a person's personality although these unwanted characteristics might be acquired. The result of carelessness is unsafe act/conditions. The third domino is unsafe act and/or mechanical or physical condition; Unsafe acts/conditions include the errors and technical failures which cause the accident. Some of the unsafe acts and conditions included: insufficient light, absence of rail guards, unguarded point of operation, removal of safeguards and mechanical or physical hazards, horseplay, starting machinery without warning, standing under suspended load (Katsakiori, Sakellaropoulos & Manatakis, 2009). Heinrich (1931) felt that unsafe acts and unsafe conditions were the central factor in preventing accidents and easiest causation factor to remedy a process which he likened to lifting one of the dominoes out of the line. The fourth domino is accident; Accidents are caused by unsafe acts/conditions and subsequently lead to injuries. Lastly, the fifth domino was injury; Injuries are the consequences of the accidents for example broken bones and cuts.

Workplace Hazard Identification

Hazard identification and risk analysis (HIRA) is a collective term that encompasses all activities involved in identifying hazards and evaluating risk at facilities, throughout their life cycle, to make certain that risks to employees, the public or the environment are consistently controlled within the organization's risk tolerance level (Purohit, Siddiqui, Nandan & Yadav, 2018). Also, Hazard Identification Risk Assessment (HIRA) is a process of defining and describing hazards by characterizing their probability, frequency, and severity and evaluating adverse consequences, including potential losses and injuries. A Hazard Identification and Risk (HIRA) analysis is a systematic way to identify and analyse hazards to determine their scope, impact and the vulnerability of the built environment to such hazards and its purpose is to ensure that there is a formal process for hazard identification, risk assessment and control to effectively manage hazards that may occur within the workplaces (Purohit, *et al.,* 2018).

Organizational Performance

Organizational performance also known as firms' performance is an indicator stating the extent to which the company runs its business, and is an important measurement for estimating the success or possibility and survival of the company (Chan, Chiu, Orr & Goldstein, 2007). According to Cascio (2014) organizational performance is the degree of attainment of work mission as measured in terms of work outcome, intangible assets, customer link, and quality services. According to Kaplan and Norton (2001) organizational performance is the organization's capacity to accomplish its goals effectively and efficiently using available human and physical resources. This definition provides the justification for organizations to be guided by objective performance criteria when evaluating employees' work based performance. This is also helpful in evaluating the achievement of the organizational goals as well as when developing strategic plans for the organizations' future performance (Ittner & Larcker, 2012).

The management of many firms are faced with the challenge to improve their performance and deal with the changing competitive arena (Williams, 2003). Firms have an important role in our daily lives, and successful firms are a key ingredient for developing nations like Nigeria. Academics

and practitioners endeavor to understand and explain the differences in organizational performance in the face of the complexity of the market, competitive pressures and uncertainties. Firms must be able to cope with the increasingly number of challenges from the business environment, in order to increase their ability to adapt (Gavrea, Ilies & Stegerean, 2011). The concept of performance of a business firm is based upon the idea that an organization is the voluntary association of productive assets, including human, physical, and capital resources, for the purpose of achieving a shared purpose (Alchian & Demsetz, 1972; Barney, 1995; Carton, 2004).

Product/Service quality

According to Zeithaml (1988), "quality can be defined broadly as superiority or excellence". Here, Kotler and Armstrong (2012) described that "product is anything that can be offered to a market for attention, acquisition, use, or consumption that MIGHT satisfy a want or need ", while Aaker (1994), quoted Ehsani (2015), said that "quality of product is the customer's perception of the overall quality or superiority of the product or service, with respect to its intended purpose, relative to alternatives. Kotler and Amstrong (2012) assumed that product quality is the characteristic of a product or service that bear on its ability to satisfy stated or implied customer needs. The measurement of quality is complex because there is no universal definition of quality. For quality to be evaluated, there must be clear definition, in the same vein, there are other measures designed using other approaches as posited by Sebastianelli and Tamini (2002) which include transcendent measures, user-based measures, product based measures, manufacturing based measures and value based measures. The quality of a product is the features of the product complemented with dimensions of a product which include; performance conformance, features, durability, reliability, aesthetics, serviceability and the perceived quality by customer. If the perceived product quality is in line with the expectation, then the customer will perceive the product quality as a good quality and also feel satisfied. Conversely, if the perceived product quality is not as expected, then the quality of the product as the customer perceived is qualified as a bad product quality.

Innovativeness

Innovation refers to the process of translating an idea or invention into a good or service that creates value or for which customers will pay; it is finding a better way of doing something (Frame &White, 2004). Innovation can be viewed as the application of better solutions that meet new requirements, in-articulated needs, or existing market needs. Innovation is accomplished through having effective products, processes, services, technologies, or ideas that are readily available to markets, governments and society. The term innovation can be defined as something original and, as a consequence, new, that breaks into the market or society (Frankelius, 2009). The measures of innovation at the organizational level include financial efficiency, process efficiency, employees' contribution and motivation, as well benefits for customers. Measured values will vary widely between businesses, covering for example new product revenue, spending in research and development, time to market, customer and employee perception & satisfaction, number of patents, additional sales resulting from past innovations (Frankelius, 2009).

Innovation can be defined as an organizations tendency towards experimenting with new ideas and supporting creative processes which precede the actions of competitors. It is a concept that is concerned with the creative tendencies of the organization through the organized actions of workers and research activities carried by the organization (Coulthard, 2007). McFadzean, O'Loughon and Shaw (2005) defined innovation as a process that provides added value and novelty to the business, its suppliers and customers through the development of new procedures, solutions, products and services as well as new methods of commercialization.

Timely Delivery

When the employees are productive, they accomplish more in a given amount of time. In turn, efficiency saves their company money in time and labour. When employees are unproductive, they take longer time to complete projects, which cost employee's more money due to the time lost (Olajide, 2000). The importance of higher productivity of the employees in public enterprise cannot be overemphasized, which include the following; Higher incomes and profit; Higher earnings; Increased supplies of both consumer and capital goods at lower costs and lower prices; Ultimate shorter hours of work and improvements in working and living conditions; Strengthening the general economic foundation of workers (Banjoko, 1996).Armstrong (2006) stated that productivity is the time spent by an employee actively participating in his/her job that he or she was hired for, in order to produce the required outcomes according to the employers' job descriptions. Timeliness is recognized as an important component of work performance (Downs, 2008) Timeliness is a way of developing and using processes and tools for maximum efficiency, effectiveness, and productivity (Downs, 2008) It involves mastery of a set of skills like setting goals, planning and making decisions better. At the end we have better performance (Brogan, 2010).

Time is an essential resource since it is irrecoverable, limited and dynamic (Downs, 2008) Irrecoverable because every minute spent is gone forever, limited because only 24hours exist in a day and dynamic because it's never static (Claessens, Roe &Rutte, 2009) According to North (2004) time management is the organization of tasks or events by first estimating how much time a task will take to be completed, when it must be completed, and then adjusting events that would interfere with its completion is reached in the appropriate amount of time. Effective time management is the key to high performance levels. Effective time management not only affects the performance of employees, but also helps to cope with stress, conflicts and pressure more efficiently North (2004).

Hazard Identification and Organizational Performance

Afube, Ify and Ugbebor (2019) carried out a study on identification of industrial hazards and assessment of safety measures in the chemical industry, Nigeria using proportional importance index. This study, which was carried out in both a petrochemical and an oil refining companies of Nigeria, identified industrial hazards and assessed safety measures in the Chemical Industry (CHI) of Nigeria. A well-structured questionnaire instrument was used for data collection. The study was carried out amongst technical staff and management staff of the chemical industry whose day to-day duty is such that they are exposed to one form of hazard or the other in the industry. The questionnaire was administered to 96 technical staff and management staff in the CHI out of which 84 (88%) were completed and returned. The study focused on types of hazards, hazards

and risk awareness, implementation of control measures and effectiveness of safety hazards and risk management programs in the chemical industry of Nigeria. Modified Proportional Importance Index (PII) and a four-point Likert scale were adopted in data analysis. Results revealed that loud noise (PII = 3.2; respondents = 92%), working at heights (with PII = 3.1; respondents = 89%) machines and equipment vibration (PII = 3.0; respondents = 87%), high voltage areas (PII = 2.9; respondents = 84%) and chemical spills (PII = 2.5; respondents = 55%) are the most high ranking hazards in the chemical industry. A high level of safety hazard awareness was found among workers in the industry ($p < 0.05$, 95%Cl.; PII = 3.1 - 3.5). The outcome of the intervention showed that Chemical Industry Number 1 (CHI-1) improved from 87.90% to 98.09%, Chemical Industry Number 2 (CHI-2) improved from 81.53% to 95.54% on worker's knowledge on the identification and assessment of hazards and risk in the chemical industries. The study was conducted among petrochemical and an oil refining companies of Nigeria which is quite but the current study is to be conducted among international oil and gas companies in Nigeria indicating the presence of contextual gap. Also, the study used Modified Proportional Importance Index (PII) was adopted in data analysis while the current study will adopt the Spearman Rank Order Correlation indicating a methodological gap exists.

Tang, Qiang, Duffield, Young and Lu (2007) discussed risk management in Chinese construction industry. Their research outcome was based on an observed survey on the construction industry in China investigating the significance of project risk, risk management application techniques, status of risk management and barriers or setbacks to risk management application perceived by project members. The risk management strategies adopted by Three Gorges Project were also analyzed. The result of the study revealed that the current risk management system cannot or is not sufficient to manage project risk, the construction industry in China have move from risk transfer control method to risk reduction, project risks are only a worry to the project members and lack of an industry accepted model for risk management is the main barrier to risk management application. They suggested that a future research should be conducted in order to improve risk management within the construction industry using different methodologies that facilitate reasonable reward sharing by the use of effective risk management among participants. The study was conducted among construction companies China but the current study is to be conducted among international oil and gas companies in Nigeria indicating the presence of contextual gap.

Based on the foregoing, the study thus hypothesized that:

Ho_1: There is no significant relationship between workplace hazard identification and product/product/service quality of international oil and gas companies in Nigeria.

Ho_2: There is no significant relationship between workplace hazard identification and innovativeness of international oil and gas companies in Nigeria.

Ho_3: There is no significant relationship between workplace hazard identification and timely delivery of international oil and gas companies in Nigeria.

METHODOLOGY

The study adopted the cross-sectional survey in its investigation of the variables. Primary source of data was generated through structured questionnaire. The population for the study was five (5) international oil and gas companies in Nigeria according to the website of the Department of Petroleum Resources (2019). Since the population was small, the entire population of five (5) international oil and gas companies in Nigeria were used as a census. However, for the purpose of data collection, fifty (50) managers were used. The hypotheses were tested using the Spearman's Rank Order Correlation Coefficient. The tests were carried out at a 0.05 significance level.

DATA ANALYSIS AND RESULTS

The level of significance 0.05 was adopted as a criterion for the probability of accepting the null hypothesis in ($p > 0.05$) or rejecting the null hypothesis in ($p < 0.05$). The level of relationship between workplace hazard identification with each of the measures of organizational performance is to examine the extent workplace hazard identification can impact on the outcome of each measure of organizational performance.

Table 1: Correlations Matrix for Hazard Identification (HI) and Organizational Performance Measures

			HI	Product/ Service Quality	Innovativeness	Timely Delivery
Spearman's rho	HI	Correlation Coefficient	1.000	.726**	.796**	.510**
		Sig. (2-tailed)	.	.000	.000	.000
		N	42	42	42	42
	Product/Service Quality	Correlation Coefficient	.726**	1.000	.931**	.839**
		Sig. (2-tailed)	.000	.	.000	.000
		N	42	42	42	42
	Innovativeness	Correlation Coefficient	.796**	.931**	1.000	.813**
		Sig. (2-tailed)	.000	.000	.	.000
		N	42	42	42	42
	Timely Delivery	Correlation Coefficient	.510**	.839**	.813**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	42	42	42	42

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Output version 23.0

RQ1: What is the relationship between workplace hazard identification and workplace hazard identification and product/service quality of international oil and gas companies in Nigeria?

H_{o1}: There is no significant relationship between workplace hazard identification and product/service quality of international oil and gas companies in Nigeria.

Table 1 shows a Spearman Rank Order Correlation Coefficient (rho) of 0.726 on the relationship between workplace hazard identification and product/service quality. This value implies that a strong relationship exists between the variables. The direction of the relationship indicates that the correlation is positive; implying that an increase in product/service quality was as a result of the adoption of hazard identification. Therefore, there is a positive and strong correlation between workplace hazard identification and product/service quality of international oil and gas companies in Nigeria. Similarly displayed in the table 1 is the statistical test of significance (p-value) which makes possible the generalization of our findings to the study population. From the result obtained from table 1, the sig- calculated is less than significant level ($p = 0.000 < 0.05$). Therefore, based on this finding the null hypothesis earlier stated is hereby rejected and the alternate upheld. Thus, there is a significant relationship between workplace hazard identification and product/service quality of international oil and gas companies in Nigeria.

H_{o2}: There is no significant relationship between workplace hazard identification and innovativeness of international oil and gas companies in Nigeria Table 1 shows a Spearman Rank Order Correlation Coefficient (rho) of 0.796 on the relationship between workplace hazard identification and innovativeness. This value implies that a strong relationship exists between the variables. The direction of the relationship indicates that the correlation is positive; implying that an increase in innovativeness was as a result of the adoption of hazard identification. Therefore, there is a positive and strong correlation between workplace hazard identification and innovativeness of international oil and gas companies in Nigeria. Also displayed in the table 1 is the statistical test of significance (p-value) which makes possible the generalization of our findings to the study population. From the result obtained from table 1, the sig- calculated is less than significant level ($p = 0.000 < 0.05$). Therefore, based on this finding the null hypothesis earlier stated is hereby rejected and the alternate upheld. Thus, there is a significant relationship between workplace hazard identification and innovativeness of international oil and gas companies in Nigeria.

H_{o3}: There is no significant relationship between workplace hazard identification and timely delivery of international oil and gas companies in Nigeria.

Table 1 shows a Spearman Rank Order Correlation Coefficient (rho) of 0.794 on the relationship between workplace hazard identification and timely delivery. This value implies that a moderate relationship exists between the variables. The direction of the relationship indicates that the correlation is positive; implying that an increase in timely delivery was as a result of the adoption of hazard identification. Therefore, there is a positive and strong correlation between workplace hazard identification and timely delivery of international oil and gas companies in Nigeria. Also displayed in the table 1 is the statistical test of significance (p-value) which makes possible the generalization of our findings to the study population. From the result obtained from table 1, the sig- calculated is less than significant level ($p = 0.000 < 0.05$). Therefore, based on this finding the null hypothesis earlier stated is hereby rejected and the alternate upheld. Thus, there is a

significant relationship between workplace hazard identification and timely delivery of international oil and gas companies in Nigeria.

DISCUSSION OF FINDINGS

The findings as presented in table 1 revealed that there is a positive significant relationship between hazard identification and organizational performance in international oil and gas companies in Nigeria. This finding agrees with the empirical study of Afube, Ify and Ugbebor (2019) who carried out a study on identification of industrial hazards and assessment of safety measures in the chemical industry, Nigeria and revealed that a high level of safety hazard awareness was found among workers in the industry. Similarly, this study agrees with the work of Tang, Qiang, Duffield, Young and Lu (2007) who found that the current risk management system cannot or is not sufficient to manage project risk, the construction industry in China have move from risk transfer control method to risk reduction, project risks are only a worry to the project members and lack of an industry accepted model for risk management is the main barrier to risk management application.

The finding equally confirms the earlier findings of Banaitiene and Banaitis (2012) who discussed risk management in Lithuanian construction projects and stated that risk management practice encourages construction companies in identifying and quantifying risks, and that risk reduction and control policies should be considered. They found that Lithuanian construction firms significantly differ from foreign countries firms in that they adopt risk management process. Lithuanian contractors' attitude towards risk management will be difficult to change due to lack of experience. They suggested that construction companies should include risk as an important part of their construction management. In risk management framework, construction projects can be improved by using both qualitative and quantitative methodologies for risk analysis.

Furthermore, the current finding also corroborates with Ehsan, Mirza, Alam and Ishague (2010) who did a study identifying and evaluating current risks and uncertainties within the construction industry of Pakistan and they found that proper risk management techniques and risk analysis are hardly used within the Pakistani construction industry as a result of lack of experience and awareness in the region. The commonly used risk measures are risk transfer and risk elimination. A result of the survey shows these practices are the causes of project complications, delays, below standard or poor quality and poor project outcomes. They suggested that professionals within the construction must be enlightened on risk management, and formal and informal training for risk management should be developed. In the formal system, graduate level education should be in introduced in construction project management and the informal should be in form of training for construction teams within the industry.

CONCLUSION AND RECOMMENDATION

This study concludes that hazard identification significantly relate with organizational performance of international oil and gas companies in Nigeria. This implies that safety assurance evaluates the continued effectiveness of implementing risk control strategies; supports the identification of new hazards.

The study recommends that Management of international oil and gas ccompanies should be committed to hazard identification by ensuring sufficient planning and proper management which is important to the safety and efficiency of the their operational locations. There are many incidents which are credited to tripping, slipping, and falling in the locations of their operations, and by having an orderly site plan, the workers would be properly appraised of the layout of the site and be able to prevent accidents.

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