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SAFETY MANAGEMENT AND SAFETY COMPLIANCE IN OIL AND GAS INDUSTRY IN RIVERS STATE

BY

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Abstract

The paper investigated safety management and safety compliance in oil and gas industry in Rivers State. The objectives of this study include to determine the influence of human resource management on safety culture for employee productivity in oil and gas industry in River State, and to ascertain the influence of employee safety compliance on reduction of accidents in oil and gas industry in Rivers State. Social exchange theory was used in the study. The purposive sampling technique was also utilized, and the study adopted a cross-sectional research design to elicit data from respondents. The data were retrieved from employees of company A and B's operation and production departments of the downstream sector of oil and gas in Rivers State and were analyzed and presented in tables. The findings revealed that the human resource management has influence on safety culture in the company for employee productivity, and that employee safety compliance influences the reduction of accidents in oil and gas industry in Rivers State. Therefore, based on the findings, this study recommends that the human resource departments in oil and gas companies should use surveillance cameras at the workplace to identity employees that comply with safety culture and procedures as stipulated by management, and reward such employees for reducing accidents, workplace injuries, and increasing productivity in the organization. Management should regularly organize safety training programmes for employees to keep refreshing their knowledge on the importance of working to stay alive, healthy and fit on the job for productivity.

Keywords: Safety, Management, Compliance, Oil, Gas, Industry

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Introduction

The issues of safety are traceable to the emergence and activities of industrialization, which stresses more on the importance of industrial and technical safety. The occurrences of workplace accidents led to the demand for safety management, technical safety improvements, and safe-tolerant facility installations in oil and gas operations. However, safety management is a proactive approach to work hazards management at all levels of work design and work operations. Safety management concerns work designs and work operations in oil and gas industry, and it assist safety managers to initiate strategies that can prevent and avoid workplace accidents and hazards. Safety management and employee compliance are determinants with the capacity of critically ensuring that there are safety outcomes and safety performance in the oil and gas industry. This approach is seen as a growing demand in petroleum industry, and more significant is that, safety outcomes remain to be achieved in relation to acceptable safety procedures in oil and gas activities at all time.

It is clearly evident that the oil and gas industry is surrounded with high-risk and complex working environment that involves exploration, extraction, exporting, scaffolding, climbing, offshore operations, refining, distribution, packaging of oil and gas substances (Thuyet et. al., 2007). Furthermore, the industry is saturated with hazardous installations and processes, heavy machineries, gas flares and heats, and dangerous high working conditions that give rise to safety and hazard management. Safety management and safety compliance are imperative in oil and gas operations because it comes with associated risk of accidents, machineries damage, environment catastrophes as well as the loss of lives (Dahl & Kongsvik, 2018). The common safety operations in oil and gas industry include risks management, process or procedures work safety, employee safety compliance, occupational safety and health conditions as well as environmental safety, all of which constitutes safety management strategies and mitigating pathways for safety outcomes and safety performance (Khan et. al., 2015).

The human resource (HR) department in oil and gas companies plays a significant role in ascertaining that safety processes are complied with in the work environment. The HR department is charged with the responsibility of initiating and implementing safety policies as well as organizing safety training programmes, developing safety culture or strategies that can minimize potential risks and guarantee a safe workplace (Asad et. al., 2019). However, the role of HR department in safety management, safety compliance details and safety performance are critical in ensuring that there is safety consciousness and practices among employees, and in fostering or promoting safety climate in the working environment (Dahl & Kongsvik, 2018). In a nutshell, the HR department is concerned with developing safety and compliance management information systems, risk-based support system, inspection and assessment system to evaluate safety and risk impacts as well as strategies for mitigation in high-risk work environment of the oil and gas industry (Asad et. al., 2019).

The petroleum industry is a workplace that is viewed to have optimum level of risky operations in relation to equivalent safety demands and occupational hazards as was found by (Pandey & Pestonjee, 2017). Such work environment increases the risk of accidents, injuries, and deaths (Al-Mekhlafi, Isha, & Naji, 2020). Therefore, safety management ideologies are found to play key role in reducing work environment accidents and injuries in the petroleum industry. To this end, for petroleum industry employee's safety in the workplace, compliance to safety work procedures were found to contribute toward achieving a safe workplace, while the ignoring of safety management processes was also found to be the root cause several industrial accidents (Ajmal, Isha & Nordin 2021).

Despite technological advancement that has led to increase in industrial productivity, the safe condition of the workplace remains a crucial challenge for most scholars and practitioners in the petroleum industry as to reduce the cost effect of occupational health and safety in the organizations (Mearns, Whitaker & Flinn, 2003). Oil and gas workers globally, in both developed, and developing countries still suffer major accidents, injuries and deaths every year. Non-compliance to safety protocols in organizations was found to have contributed to unbearable medical expenses, and other health-related challenges on employees who fail to continuein workplace safety rules (Alloni, De-Benedictis & Nobile, 2016). More so, oil firms around the world spend multi-million dollars of their annual budget in handling issues of workplace accidents outcomes as well as in developing a saferoil and gas working environment (Naji, Isha, Al-Mekhlafi, Sharafaddin & Ajmal, 2020).

International labour organization (ILO), (2018) reported that globally, 4% of gross domestic product of industrial productivity in oil and gas operations is annually impeded by the maintenance of employees' health effects as a result of non-compliance to effective safety requirements and occupational expenses, and that there are 317 million job-related deaths, accidents, injuries, and near-accident misses that are also reported annually (ILO, 2018). More so, these figures provide highlight on the need for conscientious efforts for safety management in the oil and gas industry. Safety management was found to reduce work environment injuries and accidents (Hong, Surienty & Hung, 2011). Therefore, there are insufficient studies related to oil and gas operations on safety management as well as on safety compliance and safety outcomes in the reduction of workplace injuries and accidents (Hanafi, 2018).In addition, (Hanafi, 2018) found that safety management, safety compliance and safety outcomes had positive relationship in the reduction of work environment injuries, accidents and deaths in high hazardous oil and gas industry. There is more emphasis on employee health and occupational safety regulations or guidelines in oil and gas workplaces for accidents and injuries reduction. Therefore, government and oil companies, are responsible in creating more awareness on workplace safety practices (Ajmal, Isha & Nordin, 2022). This is because the oil and gas industry are perceived as the backbone of oil producing countries economy, the ineffectiveness of safety management can result to workplace injuries, accidents and deaths, and that can make companies to pay bogus compensation to employees for lost working days and hours (Vinodkumar & Bhas, 2010).

Liu et. al., (2020) in their study on employee's safety knowledge and safety performance found that safety training has positive effect on the employees' safety knowledge and safety performance. While high safety performance depended on safety training as was found by (Khdair et. al., 2011). It was also found that safety training has link to lowering of mishap rates at workplace, as was also found by (Vinodkumar & Bhasi, 2010). Therefore, safety training improves the efficiency of employees' productivity. However, Lambert et. al., (2020) found that safety training boosts work productivity and safety performance. Thus, it is against these backdrops that this paper seeks to investigate the influence of safety management on employee productivity in oil and gas operations, and the influence of employee safety compliance on reduction of accidents incidences in oil and gas operations.

Objectives of the Study

1. To determine the influence of human resource management on safety culture for employee productivity in oil and gas industry in River State.
2. To ascertain the influence of employee safety compliance on reduction of accidents in oil and gas industry in Rivers State.

Research Questions

1. What is the influence of human resource management on safety culture for employee productivity in oil and gas industry in Rivers State?
2. What is the influence of employee safety compliance on reduction of accidents in oil and gas industry in River State?

Human Resource, Safety Culture and Employee Productivity in Oil and Gas Industry

In order to have employees that are effective in productivity in the oil and gas industry, it is imperative for oil companies' human resource management to ensure there is the existence of safety culture within its workplace. Oil firms are having adequate resources like manpower, money, materials, equipment, supplies, insights, ideas and knowledge that position the human resources department to initiate and manage safety requirements and performance (Mohammed et. al., 2020). Since the human resource arm is obliged to manage employees, there main role in most organizations focuses on growing and sustaining productivity through strategic approaches in modern personnel or employee management. Human resource safety management is an essential area of organizational safety, safety regulation, and safety performance management (Wood & Bischoff, 2020). In this aspect, human resources management incorporates the administration of safety culture as required by the firm as well as providing access to safety equipment, safety rules and safety outcomes to strengthen the attainment of the company's goals (Nawar, 2019). The optimum objective of any oil firm is to ensure that the human resources accomplish its vision of sustainable safe workplace, employee productivity through its safety management processes, safety procedures and compliance feedbacks on the procedure's effectiveness (Ngumbi & Wambua, 2019). However, when employees work productively with dedication to safety regulations and procedures, the organization will have less accidents and injuries in the workplace. Consequently, the employee's productivity becomes tantamount to the organization productivity (Aeknarajindawat & Jermsittiparsert, 2020).

Effective human resource safety management (HRSM) can offer significant advantage in improving employee work safety, health and productivity in organizations (Karman, 2020). Therefore, safety minded and productive employees are the bedrock of organizational safety performance. HRSM's effectiveness remains the available mediator to employee safety compliance as well as improving the safety culture and safety attitudes amongst employees in upstream and downstream oil and gas companies. Hence, HRSM are mainly viewed as a critical component of the competitive advantage in modern oil and gas firms. HRSM are obliged with the task of identifying and evaluating the safety procedures overtime, and to assess the effective implementation of safety policies, rules and regulations of the organization to know how it may offer good safety outcomes as well as contribute to the success and productivity of the firm in the competitive oil and gas industry as opined by Hendry (2012).

The promoting of safety culture in high-risk petroleum industry has been viewed to be of priority in determining employee safety compliance, safety outcomes and safety performance. For the productivity of the extremely competitive global oil and gas industry, a strategic and effective approach of safety management is indeed crucial. The core purpose for safety culture in petroleum industry is to protect the workers, environment and the organization from risks and damages. According to Nyarugwe, Linnemann & Luning (2020) to make employees realize the necessity of safety perception and safety attitudes, there is need for petroleum companies to conduct safety assessment periodically as a way of making it the company's strategy for work environment safety (Naji, Isha& Al-Mekhlafi, 2020). It is

important for safety culture to persist among petroleum companies, this is because of the high-risk conditions the industry is facing. Therefore, the initiating of high-levels of safety strategies, procedures for doing high-risky works, and evaluation of safety performance are all vital to the success, productivity, and survival of competitive firms even as there can be regulations, rules and legislations placed by various government and its agencies in oil and gas industry in different countries.

According to Nyarugwe et. al., (2020) safety culture evaluation allows firms to better have more perception on how employees understand the importance of safety management and safety performance. It can also enable employers to identify the weakness and strength of safety regulations, as well as enabling it to frequently monitor and advance its approach or strategy to safety. In addition, safety culture remains a contentious issue in the petroleum sector. Following the functionalist and interpretive arguments on safety management, there are stronger divergences and enthusiastic developments that safety is unavoidable in industrial settings over decades (Roughton, Crutchfield, & Waite, 2019). However, this knowledge and understanding features in several and potentially complex or competing interests. Furthermore, safety culture in this perception is critically an example of key issues of industries (Roughton et. al., 2019).

For instance, according to Aswathappa (2015) employees having positive workplace safety consciousness and attitudes give attention to lessons derived from safety inductions and trainings. The knowledge of safety procedures enables employees to work productively, and they can also urge other co-workers at workplace to follow safety rules, regulations, and procedures as they perform work functions toward improving productivity. Li et. al., (2020) argue that workers with contrary safety attitudes occasion unnecessary workplace risks, while ignoring safety procedures. More so, Laura (2019) argued that the safety commitment of most employers in making the workplace safe as well as improve employee work productivity, reduce work environment accidents and protect employee health is believed to be the appropriate resolution of management in any organization that foresee having an enduring productivity. However, the problems that may persist over time is the potential negative employee safety attitudes that can increase the occurrences of loss of work hours due to the event of workplace accident. According to Kundu (2016) negative safety attitudes cannot allow employees to become productive because of potential events of accidents. Therefore, addressing negative safety attitudes among employees is imperative through organizing of safety programmes that can include safety training, safety control and safety assessment.

Lencioni (2019) argued that insufficient safety programmes such as safety training and safety procedures, and absence of safety consultants in organizations can lead to negative safety attitudes. This condition causes employee phobias and overconfidence in taking unnecessary or avoidable risks at workplace. This can also lead to consistency in workplace accidents as well as allowing low productivity time in terms of employee accomplishment of tasks. Furthermore, Huang et. al., (2022) posits that organizing safety training programmes for employees may contribute in eliminating undesirable safety attitudes at the work environment. Therefore, the inclusion of safety training, safety performance and safety compliance audits, safety drills, safety laws and rules, safety talks and safety seminars among others increase the forum for the elimination of negative safety attitudes, contributes in the reduction of chances of potential accidents as well as influencing the employee productivity. Dessler & Varrkey (2015) also opined that workers' safety attitude can be changed by determining whether workers adhere to existing safety rules, safety procedures, and safety regulations; this process determines safety performance and employee work productivity.

Employee Safety Compliance and Accidents Reduction in Oil and Gas Industry

The compliance to safety regulations involves a systematic observance of safety practices and procedures that promotes workplace safety performance and outcomes in relation to safety management (Abuashour & Hassan, 2018). The maintaining of safety policies and practices in oil and gas operation improves safety performance. In addition, the inclusion of accident causes, incidences reports and investigation outcomes can cause management to improve on employee safety training, safety promotion and safety outcomes to ensure a reduction to the rate of workplace injuries, accidents and deaths (Naji et. al., 2020). According to Neal & Griffin (2000), there are two patterns of behaviour that is adopted by employees at the workplace, and this includes safety compliance and safety participation (Hong, Surienty & Hung, 2011). These two patterns of behaviours can build employee safety compliance behavior stronger; and they identify that safety management can assure safety outcomes that can be given intrinsic consideration (Ricchiuti, Postiglione, Galle & Liguori, 2018). However, safety management and commitment to potential safety outcomes can motivate oil and gas workers to ensure compliance safety regulations, rules and procedures. This approach can assist in the maintaining of workplace safety in all operation of petroleum producing and storage organization. This can also encourage workers to put more efforts on engaging in safety regulations, safety compliance, safety outcomes and safety programmes enlisted for employees (Linnan, Leff & Martini, 2019).

In safety management, rewards and incentives strategies are sometimes adopted to promote and encourage employees to be safety compliant, while in other cases penalties are melted on employees that ignore safety procedures as well as the safety culture in existence within the organization. Bhasi et. al., (2010), posits that it is essential to use these tactics of rewards and incentives to motivate workers to ensure there is safety compliance. In safety management, the use of these tactics is mostly successful while implementing safety programmes. In addition, it can play critical role in preventing, controlling and reducing workplace accidents and injuries due to the outcomes of safety culture common to the organization. However, safety compliance can engender positive outcomes, and it can be mediated by employees' that are prone to having positive safety attitudes and behaviour (Gard & Larsson, 2017). More so, it is organizational safety management that can assure safety compliance for the reduction of workplace injuries, accidents and deaths in extreme hazardous petroleum working environments.

Safety compliance is the critical aspect of safety performance and safety outcomes. In a more safety sensitive petroleum organization, safety management focuses on controlling or reducing work environment accidents through effective employee compliance to safety rules and procedures of work activities as well as reportage and investigation of workplace accidents. These processes can help in discovering the causes of potential accidents and strategies for knowing solution approaches (Alloni, De Benedictis & Nobile 2016). Furthermore, safety rules, safety regulations as well as safety procedures are necessary to ensure that employees are kept protected from harms to their health, body and income. The inclusion of the use of personal protective equipment as well as the application of work-life balance practices toward ensuring reduction in workplace hazards are primarily required for the organizational workers to ascertain safety performance and safety outcomes as desired by petroleum firms (Baima, Omer, Varlotto & Yunus 2017). Moreover, safety compliance is a key factor that reduces potential workplace accidents incidences and injuries (Naji et. al., 2020). The safety management strategies adopted in oil and gas can enable the practicability of safety compliance which also can contribute to safety performance and safety outcomes in successful oil and gas operations. This approach plays a major role in reducing the rate or

frequency of accidents and injuries at the workplace (Agarski, Hadzistevic, Budak, Moraca & Vukelic, 2019).

According to Hopkins (2005) employees that comply to safety regulations do so for the purpose of their own safety, safety of co-workers and protection of company's equipment from workplace damages, accidents, and loss. It is expected that safety compliance should become a ritual practice mandatory for each employee, co-workers, and contract workers. However, it is statutory for oil and gas workers to follow and sustain the safety rules and safety procedures evolving within the petroleum industry. Similarly, Borys (2009) posited that workers must have to continuously follow the safety procedures checklist while performing high risks job tasks, and that it can assist in promoting safe work behaviour at the oil and gas work environment. The major variance between safety compliance and safety practices is the hazard management tactics that enables commitment in safety compliance (Hu, Yeo & Griffin, 2020).Furthermore, safety management needs to focus deeply on safety compliance procedure and practices to ensure reduction on the chances of potential risks conditions at the workplace. Hence, it is important for employees to ensure safety compliance at workplace to reduce occurrences of accidents, injuries and avoidable deaths (Hong et. al., 2011).

Safety management and safety compliance are the key indicators of safety outcomes and safety performance in reducing workplace injuries and accidents ratio in the oil and gas industry. However, safety compliance and outcomes demand that employees become active participants in safety management strategic training programmes (Teoh, Cho & Wei, 2020). Hence, safety training activities can improve employees' compliance, understanding, knowledge as well as capabilities to identify and report hazardous factors at the workplace (Teoh et. al., 2020). Meanwhile, safety training can help to minimize potential accident and injury risk as well as to adapt to corrective measures toward preventing workplace accidents and injuries (Fruhen, Griffin & Andrei, 2019).Therefore, safety compliance, safety performance, and safety outcomes are all significant in reducing workplace risks. Safety training can also improve employee retention as well as safety compliance (Bowen et. al., 2011). It affords employees' the knowledge, skills, and capabilities of following the safety procedures in all aspect of their work (Pandy & Rogerson, 2023).

Theoretical Framework

The social exchange theory was adopted in this study. This theory was propounded by Balu (1960) and it emphasizes that employees' interest of participation in safety-prone activities can be as a result to safety related attitude, behaviour and may lead to reducing health-related risks. The outcome is that employees in organizations work based on safety knowledge; they respond to organizational expectations to perform job-related activities Gupta (2010). Therefore, in line with the social exchange theory of Balu (1960), in safety management, employees accept safety compliance procedures at the work environment, and this can reduce the incidences of potential injuries and accidents (Kvalheim & Dahl, 2016).

The social exchange theory of Balu (1960) also emphasizes that as employees perceive and react that management is fully committed to their personal safety, they can develop a deep sense of job obligation, job-related tasks which are carefully performed, which also puts forward a significant outcome on the company's safety performance. More so, the sense of job obligation can promote safety attitude and behaviour among employees, which altogether contributes to promoting organization safety culture. Hofmann & Morgeson (1999) posited that workers react based on their welfare issues in most companies by complying with their safety rules and safe work procedures and also engage in certain behavior that leads to

reduced workplace accidents and injury chances.40 These past studies show the impact of the relationship between safety compliance and safety outcomes, which leads to the development of the proposed hypotheses (Section 3)Based on the theory, employees commence following the safety routines, rules as well as safety procedures to prevent negative workplace outcomes. Hence, Griffin et. al., (2010) opined those workers with positive attitudes and behaviour have to be frequently motivated for safety compliance at the workplace.

Materials and Method

In this study, cross-sectional research design was used, and data were retrieved from employees of company A and B's operation and production departments of the downstream sector of oil and gas in Rivers State. These respondents were material specialists, pipeline welders, and chemical handling specialists. Safety management questionnaire were arranged in four Likert format of strongly agree, agree, strongly disagree and disagree, and distributed through the human resource managers of company A and B respectively. The management gave support due to the assurance of confidentiality, as safety was always of high priority to the companies. A total of 240 respondents were purposively selected from company A and B, and the sample size of 120 from company A and 120 sample size from company B. A total copy of 240 questionnaires were distributed purposively to each company, as company A and B received 120 copies each. More so, 232 valid copies of completed questionnaires were retrieved after administering the questionnaires purposively to the respondents.

Results and Discussion

The findings of the study were analyzed in percentage and presented on tables as thus:

Table 1: Summary of responses on the influence of human resource management on safety culture for employee productivity in oil and gas industry in Rivers State

Variables	Frequency	Per cent
Strongly agree	104	44.8
Agree	112	48.3
Strongly disagree	10	4.3
Disagree	06	2.6
Total	232	100

Source: Nworgu and Amadi (2025)

Table 1 indicates that 104 (44.8%) strongly agree and 112 (48.3%) agree that human resource management has influence on safety culture for employee productivity in oil and gas industry in Rivers State, whereas, 10 (4.3%) strongly disagree and 6 (2.6%) disagree that human resource management has influence on safety culture for employee productivity in oil and gas industry in Rivers State. As a greater number of respondents agree to the stated opinion, the study stands to retain that human resource management has influence on safety culture for employee productivity in oil and gas industry in Rivers State. This finding is in agreement with the findings of Dimitrios et. al., (2020) that safety culture is considered as a powerful force that shape human behaviour for economic activity and labour productivity.

Table 2: Summary of responses on the influence of employee safety compliance on reduction of accidents in oil and gas industry in River State

Variables	Frequency	Per cent
Strongly agree	122	52.6
Agree	96	41.4
Strongly disagree	08	3.4
Disagree	06	2.6
Total	232	100

Source: Nworgu and Amadi (2025)

Table 2 reveals that 122 (52.6%) respondents strongly agree and 96 (41.4%) agree that employee safety compliance influences the reduction of accidents in oil and gas industry, while, 8 (3.4%) respondents strongly disagree and 6 (2.6%) disagree to the stated opinion respectively. Therefore, a greater number of respondents agree that employee safety compliance influences reduction of accidents in oil and gas industry. The study retains that employee safety compliance influences the reduction of accidents in oil and gas industry. The finding is in tandem with Ajmal et. al., (2022) that safety compliance is associated with the reduction of occupational accidents.

Conclusion

Safety culture in petroleum companies is of necessity because it is viewed as an integral aspect that improves the safety consciousness and safety attitudes of employees. This notion posits that organizations amass more profit, and claims of compensation for accident and injuries are reduced. Safety compliance has shown to reduce the incidences of accidents and injuries, and employees who comply with safety procedures have lesser chance of experiencing workplace accidents. Employee safety compliance have shown that the capacity of productivity for organization's productivity, reputation and safety performance in relation to safety management by the human resource personnel to employees' safety outcomes at the workplace. The findings of this study have proved that the human resource management has significant contribution to safety management, safety culture, safety compliance and safety outcomes toward controlling occupational accidents and workplace injuries.

Recommendations

The study provides the following recommendations

1. Government and its oil and gas regulatory agencies should ensure that safety policies and regulations are critically and periodically reviewed to match modern facilities that are used in oil and gas operations across the State oil and gas industry.
2. Human resource departments in oil and gas companies should use surveillance cameras at the workplace to identity employees that comply with safety culture and procedures as stipulated by management, and reward such employees for reducing accidents, workplace injuries, and increasing productivity in the organization.
3. Management should regularly organize safety training programmes for employees to keep refreshing their knowledge on the importance working to stay alive, healthy and fit on the job for productivity.

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