

## **Safety Sustainability Management in Some Selected Industries in Greater Accra Region**

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### **Abstract**

Safety sustainability management in selected industries is essential as industrial operations cannot be completely free of hazards and risks. The aim of this paper is to examine safety practices, determine the safety management, sustainability and implementation in industrial operation to reduce and eliminate engineer operational accidents and serious incidents.

As human activities and systems cannot be completely free from operational errors and consequences. Questionnaires were administered to selected industries in Greater Accra Municipality seeking the views of personnel on safety management implementation and the data obtained were analysed by using SPSS. The findings of the study identified the gap of emphasizing on safety training and implementation at the educational level to build the skills of personnel in safety practices for industrial development.

The study recommends that workers must be trained and encouraged to identify unsafe workplace conditions or hazards and also workshop managers acting as safety practitioners be given further training in safety sustainability management for improve operational management of personnel. The study adds to the existing knowledge of safety management implementation in engineering industries in Greater Accra Municipality, Ghana.

**Keywords:** Safety Management, Implementation, Sustainability, Selected Industries, Working Condition.

### **1. Introduction**

Safety management is the assets to control risk, measure the range of accident or fatalities taking place for a team of works. Accident prevention has been taken into account solely after an accident has occurred and caused damage. Safety sustainability management in industries was as a result of lack of safety practitioners in place to train and equip employees with safe working practices. However, the aim is for safety implementation and sustainability in the industries as most industries lack the need of safety supervisor for risk management and accident prevention. As there are no academic and career progression in that field in the educational institutions.

Safety Management System in industries is important in managing the risk of dangerous activities which may also lead to accidents, hazard identification, management and undesirable occurrences within the selected industries such as AJ Plant Pool, SA Automobile, Hyundai Motors, Agricultural Engineering Services, ECG Legon workshop and 49 Engineer Regiment.

When safety sustainability is not adhered to or maintained, the existence of employees and property are in danger as some accidents are due to lack of safety management.

Safety management for flight activities are abundant but limited resource of safety management system for literature and research for safety management in maintenance operation (Heng, 2005). Every industries is to develop for the implementation and monitoring of safety management (Okema, 2016). The need to examine safety management implementation and performance in our working organization (Yiu & Chan 2019). Accident cases continuously been reported in industrial activities need to focus on safety implementation (Razali 2018). Lack of employees to adapt to safety practices is the cause for accident on site (Omolola & Ibrahim 2019). Most workplaces do not considers the safety and health of personnel as a priority (Kagawa, 2011).

## **2. Methodology**

The sample size of 250 personnel from the six (6) industries and the population of this study includes employers, supervisors, technicians, engineers and craftsmen. The data sampling techniques used is as questionnaire were administered amongst six (6) industries out of many institutions base on how reliable these industries are in their operations. Based on the recommendation of (Gay& Airasian, 2003) that a sample size of 10% to 20% of the target population is representative in descriptive research. The sample size from various institutions represent about 17% of the target population and was accepted as representative of the target population. This is greater than the minimum suggestion proposed by (Gay & Airasian, 2003).

Data collected were analysed using Statistical Packages for Social Science (SPSS) where the average score rates were used to rank the questionnaire. The study involves the use of a survey and research strategy in data collection, analyzing and interpretation of data to understand the study. The study was conducted in Grater Accra Metropolitan Area thus the capital town of Ghana. The city was chosen for the study due to (1) its industrial hub (2) divert institutions and (3) activities for central business area for engineering industries.

The data used in the study is a mixed method, as a designed questionnaire for the survey contains questions to collect the quantitative data (numerical) and an open-ended questions for narrative to collect qualitative data (textural).The study is to determine the elements of Safety Sustainability Management from the various selected industries in order to assess its safety performance in these areas.

## **3. Results and Discussion**

### *3.1. Safety Supervisors Role*

Respondent's scores YES, for 157 personnel as it represent 63% out of 250 respondents. The score, sometime = 3 is the highest score for YES. As supervisors sometime provides PPE for employees and inform personnel about their responsibilities on safety practices, provides instructions on hazards in the workshop on safety awareness. As 93 personnel scores NO which represent 37% out of 250 respondents. The score of Once =1 and Seldom = 2 are the lowest scores for NO, respondents suggests that no safety officer exist in their working environment and that normally leads to lack of enforcement in safe working practices and procedures, as this

failure leads to accidents, there are no instructors who must be responsible for training and periodically remind personnel on how to correct and report unsafe working conditions or hazards.

Table 1. Safety Supervisors Role

	Mean Scores
Do you have a safety supervisor who examines workers on protective measures?	Seldom = 2
Does safety supervisor arrange workshop on safety?	Once =1
How frequent are workshop safety organized?	Once =1
Does supervisors consider employee’s safety?	Sometime = 3
Does supervisors evaluate on how safety measures can be improved?	Once =1

Source: Field survey, September 2021

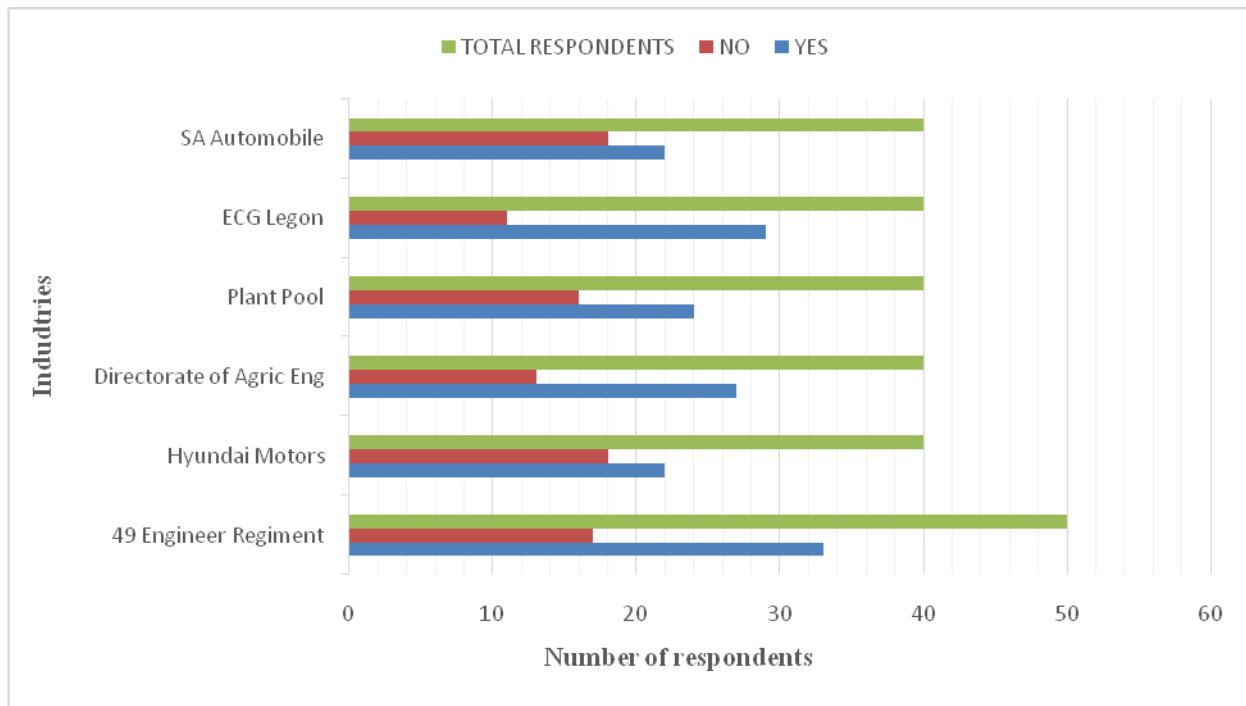


Figure 1. Chart for respondents on safety supervisor roles

### 3.2. Hazard Identification

Personnel scores YES, for 144 workers, as it represents 58% out of 250 respondents. The score rate, High hazard = 3 is the highest score for YES, were indication by respondents to identify hazards and risk factors that have the potential to cause harm in their various workshops. Safety trainers sometimes setup formal processes for personnel to report hazards they see, conduct surveys to receive safety inputs from workers and creates committee of employees to discuss workplace hazards. However, the low hazard = 1, as 106 respondents score NO for low hazard, it

represent 42% out of 250 respondents, as supervisors take measures to comply with safety measures to minimize the rate of hazards by collecting information from injury reports and workshop inspections for better workplace hazard assessment.

Table 2.Hazard Identification

	Mean Scores
Are hazards recognized in your organization?	High hazard = 3
Are employees exposed to hazard that could cause the loss of their lives?	High hazard = 3
Are workers subjected to dangerous equipment?	Low hazard = 1
How do employees quickly deal with hazard they come in contact with?	Low hazard = 1
Are there warning signs in place that helps curtail the accidents in your organization?	High hazard = 3

Source: Field survey, September 2021

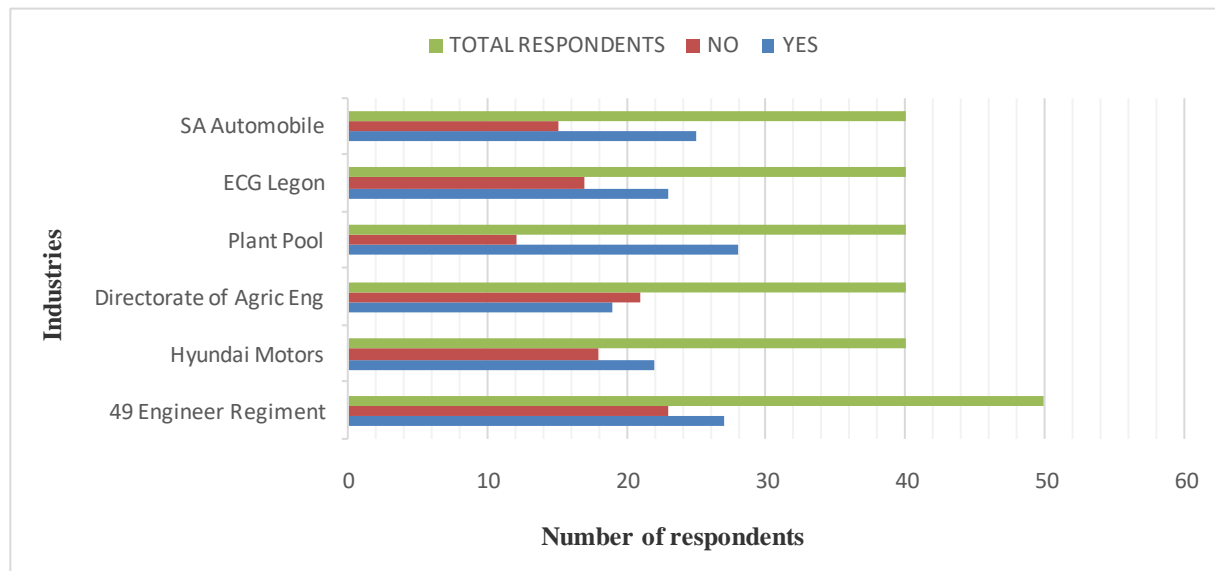


Figure 2. Chart for respondents on hazard identification

3.3. Risk Assessment

The most scores for risk assessment are High risk=3 is the highest score rate for YES and 1= Low risk or 2 for Moderate risk for NO responses. As 153 respondent’s score YES, it represent 61% out of 250 respondent and 97 respondents score NO, it represent 39%. Various risk categories were identified. Mostly high-risk categories are serious hazards that includes head

injuries, fatalities, fractures, loss of blood and poisoning. The moderates-risk includes less-serious injuries, that are burns, strain, sprain and injuries that need adequate care. Low-risk are treated using first aid, as minor pain, dizziness and irritation. Risk evaluation was also a challenge by most of the safety practitioners to identify risk and develop solutions for each risk, to protect workers.

Table 3. Risk Assessment

	<b>Mean Scores</b>
Does the organization have assessment process for identifying risk?	Moderate = 2
What risk assessment does the company have in place?	High risk = 3
Do you agree with the risk that has been identified by management?	High risk = 3
How is the risk to the organization presently managed?	Moderate = 2
The consequences to the organization if risk assessment is not adhered to?	High risk = 3

Source: Field survey, September 2021

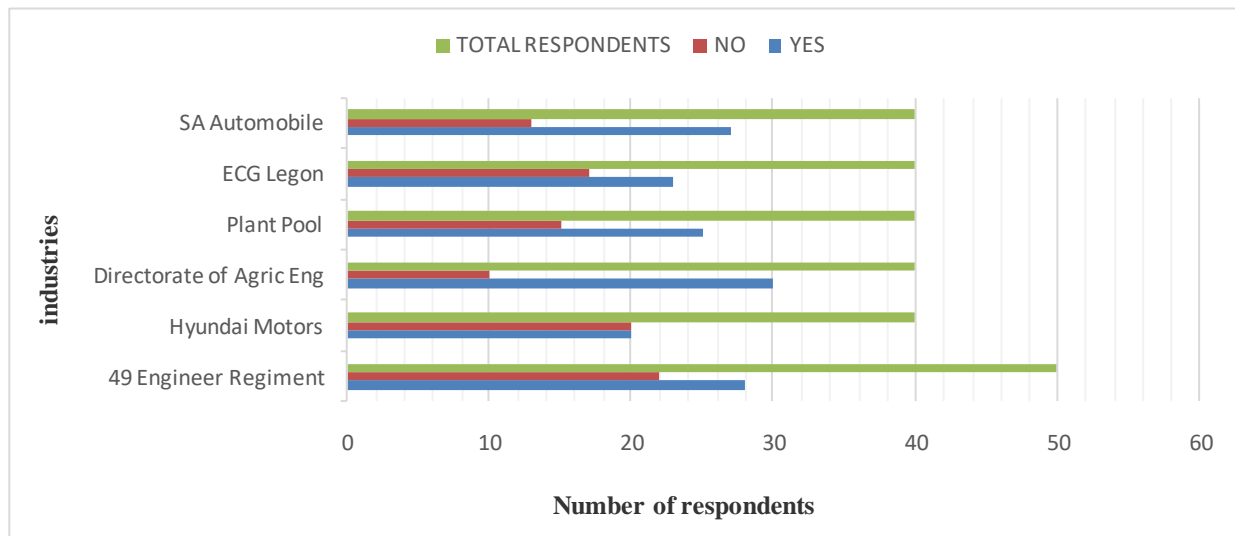


Figure 3. Chart for respondents on risk assessment

### 3.4. Defensive Measures

Defensive measure, as is the responsibility of personnel to protect themselves when working or operating equipment or machines. The scores are Satisfied = 3 is the highest score for YES and Dissatisfied = 1 is low score for NO, as 99 respondent's scores YES, it represent 40% out of 250 respondent. They were satisfied with the provision of PPE to be used by personnel, as PPE were not adequate but personnel did manage with it. Majority were dissatisfied, thus 151 respondents of 60% out of 250 personnel were dissatisfied, as no First Aid kits were available or provided to

take care of immediate accidents in the working environments. Fires extinguishers were found to have expired and they lack training in the use of the extinguisher during emergency on how to fight the fire. Machinery usage was also a challenger, talking whiles operating and others close to the machines.

Table 4. Defensive Measures

	<b>Mean Scores</b>
Are personnel satisfied of defensive measures with regards to safety in your organization?	Dissatisfied =1
How effective are these defensive measures to personnel.	Dissatisfied =1
Do safety supervisors check if employees adhered to defensive measures?	Moderate= 2
Are there any punishment to personnel who do not comply with the defensive measures in the organization?	High=3
What are the consequences if the defensive measures are not adhered to?	High risk=3

Source: Field survey, September 2021

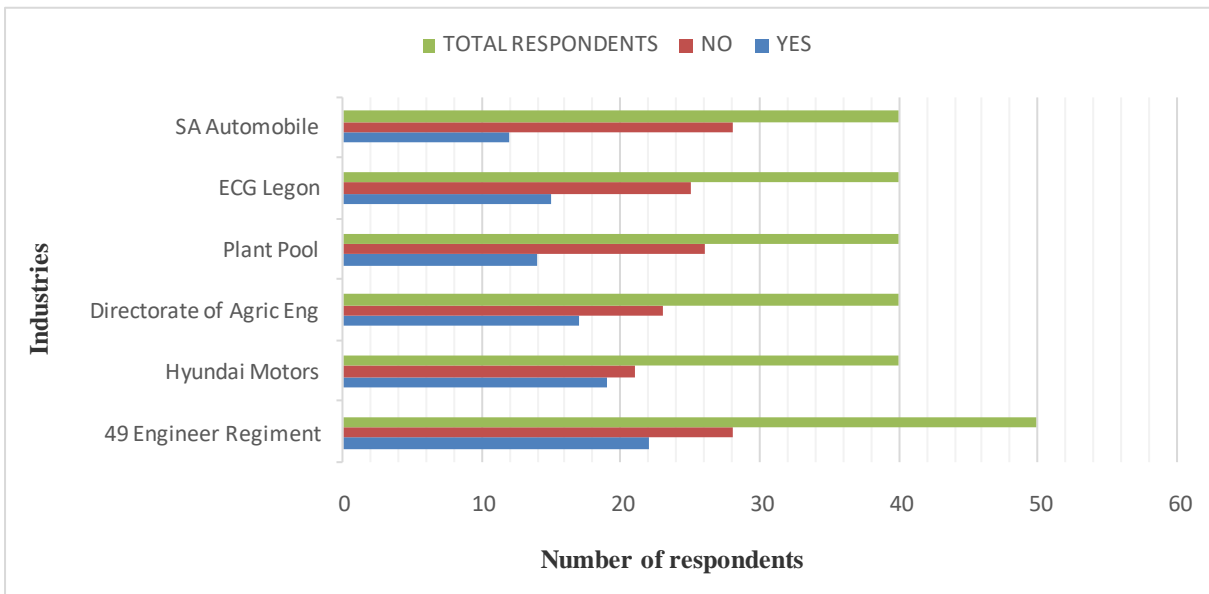


Figure 4. Chart for respondents on defensive measures

### 3.5. Working Conditions

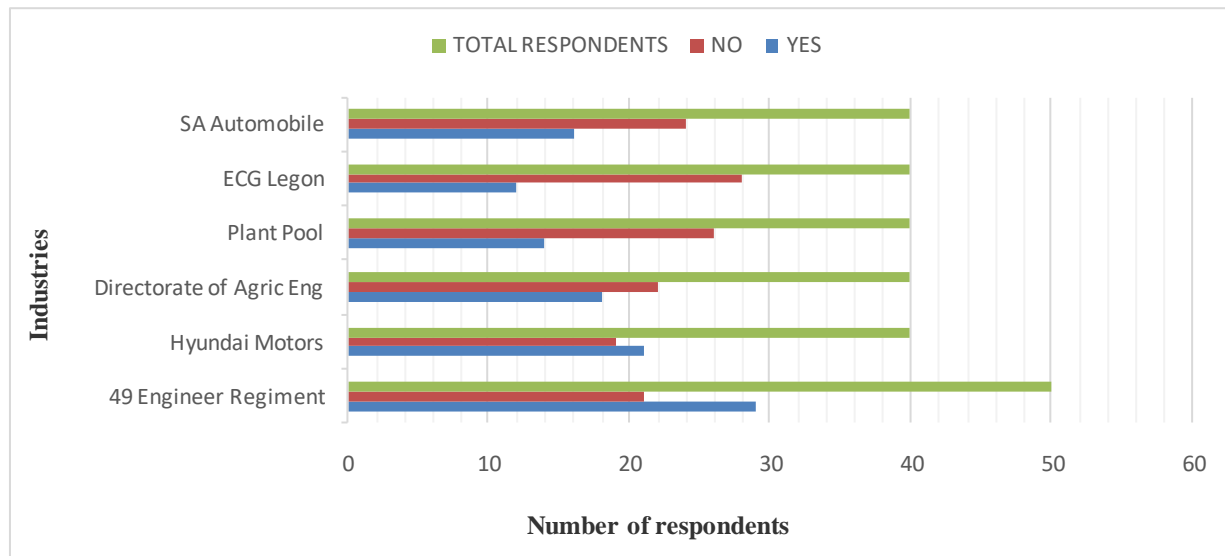
The working conditions and environments of some selected industries, although governed by minimum employment standard, most of the personnel and employees fails to respond to unsafe working conditions as this affected the health and safety of some personnel. As 110 respondent's scores YES, as it represent 44% out of 250 respondent and 140 respondent's scores NO, as it

represent 56% for poor working conditions = 1, is the low score for NO. Respondents complained of their working equipment not maintained and not working properly, the failure to have safety protective guards, some exits ways blocked, inadequate warning systems to indicate areas of hazards. Poor working conditions makes students and workers uncomfortable to work effectively.

**Table 5. Working Conditions**

	<b>Mean Scores</b>
Does the company have good working conditions?	Poor= 1
Are the working conditions in your company active?	Fair = 2
Are personnel satisfied with these conditions?	Dissatisfied =1
What are some of the conditions that need to be reviewed?	Poor= 1
Are all the working conditions in your company applicable to all?	Fair = 2

*Source: Field survey, September 2021*



*Figure 5. Chart for respondents on working conditions*

**3.6. Action Failure**

Human and technical failures are the action failures attributed to safety management in most of the industries. However 155 respondent’s scores YES, as it represent 62% out of 250 respondent with scores for High risk = 3 is the highest score for YES and 95 respondent’s scores NO, as it represent 38%, where Low risk score is = 1. Human action failures are the unintentional action and intentional failures of skill errors, Slips of action and mistakes were human actions and errors noticed. These can be minimized to reduce lapses by the use of checklists to help confirm actions that have been completed, cross checking complicated tasks. The aspect of technical

action failures are machines failures as a results of equipment in improper operation, failure to continuously monitor equipment in operation, as any fault may lead to production interruptions.

Table 6. Action Failure

	Mean Scores
What are some of the action failures in your company?	Moderate = 2
Are the action failure as a result of human or technical errors?	High = 3
What are the remedies to action failure due to human activities?	Moderate = 2
What are the remedies to action failure due to technical activities?	Moderate = 2
What are some of the implications/ effects your company suffers due to action failure?	High = 3

Source: Field survey, September 2021

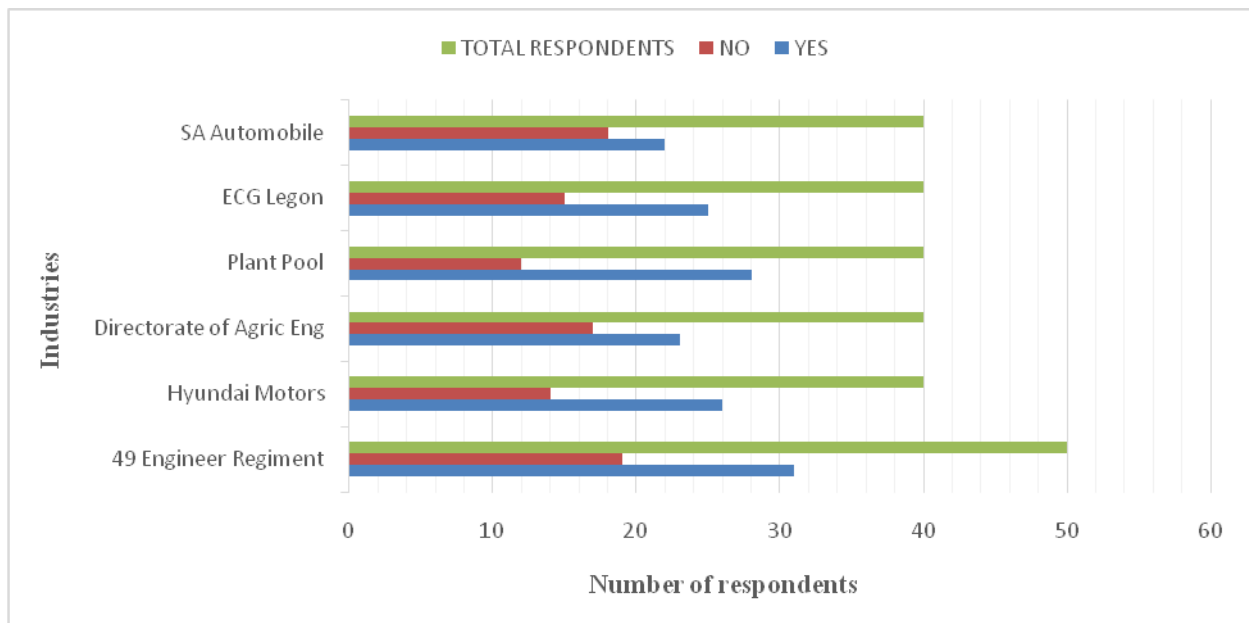


Figure 6. Chart for respondents on action failure

### 3.7. Safety Performance and Monitoring

Safety performance and monitoring are standards used for measuring the effectiveness of the elements in safety sustainable management, to show how the various selected industries ensure the effectiveness of the safety management and to improve the safety performance in their working environments. As 153 respondent's scores YES, as it represent 61% out of 250 respondent and 97 respondent's scores NO, as it represent 39%. Records of occurrence on hazard and dangers on human activities was used to monitor safety performance in various selected



industries. Compliance by most of workshop instructors on safety performance and monitoring provide information to determine the level of risk control in their working environment. Monitoring is achieved by developing a checklist and inspection form to cover all the systems to be monitored.

Table 7. Safety Performance and Monitoring

	Mean Scores
Are there systems in place to monitor and measure the safety performance within your company?	Poor= 1
Are the systems able to validate the effectiveness of safety risk controls?	Poor= 1
Does the safety monitoring process rely mainly on workers identifying existing risk and hazards by using their experience and skills?	Sometimes= 3
Why should safety performance be monitored?	Moderate = 2

Source: Field survey, September 2021

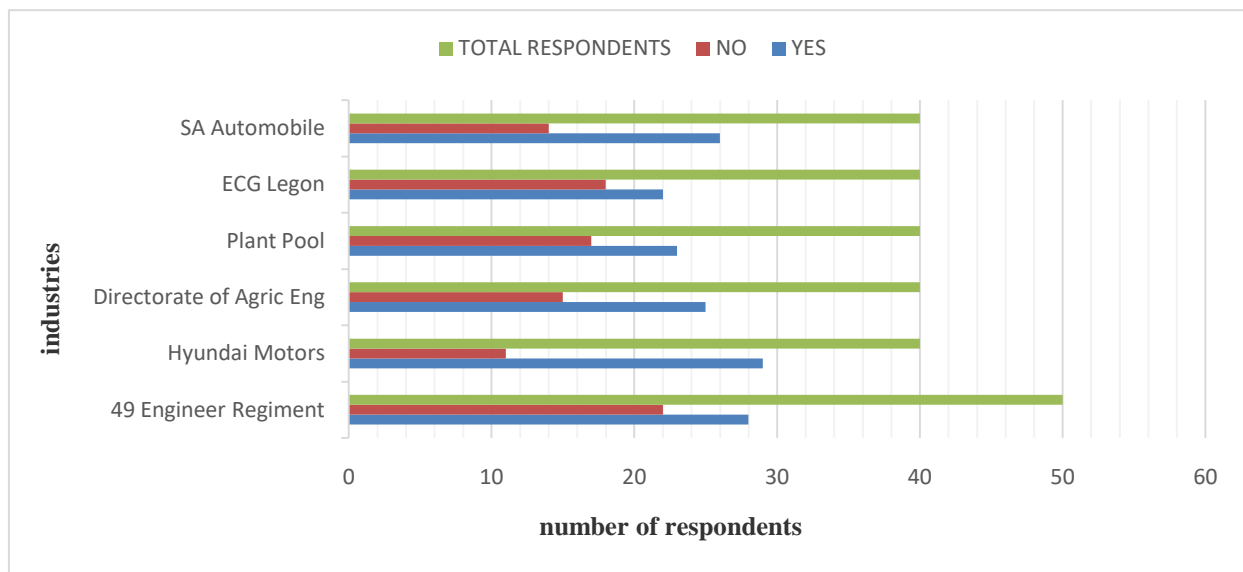


Figure7. Chart for respondents on safety performance and monitoring

**Recommendation for policy formulation**

Based on identified elements of safety practices and implementation of Safety Management System in various selected institutions. It is therefore recommended that workshop managers acting as safety practitioners be given further training in safety sustainability management to improve operational management of personnel. Regulatory body be established to monitor and enforce the implementation of safety management in the industries. Ghana Institute of Engineers and Technologies must organize seminar training on safety management for its members acting as safety practitioners in industries to benefit. KNUST in future should offer certificate or diploma programme on Safety Management or Engineering to enhance career progression for regular and distance programmes.

Stakeholders must enforce employment of safety practitioners before any company registration and renewal of licenses. Ghana Education Service must implement Safety Management course in our secondary and technical institutions as they are being taught in building skills for industrial development. Workers must be trained and encouraged to identify unsafe workplace conditions or hazards and practices.

### **Conclusion**

Safety sustainability management in organization have been identified as effective tool in enhancing safety in our working environment. The study then identified the elements in safety management, as adopted by various organization would better improve their performance and implementation. The results shows how various elements were determined by the respondents' rates of score in their organizations.

Safety supervisor's role, as 157 personnel scores represent 63% on the need of safety practitioner in industries. This shows the importance of safety supervisor roles as a form of providing leadership in management of the organization and training of personnel on safety practices. Respondents of 144, score rates on high hazard is 58%, as hazard and risk identification place the responsibilities on both management and employees for provision of warning indicators at the required place to be recognized by employees.

Risk evaluation, 61 % of the 153 respondents admit the most risk occurrence such as fractures, loss of blood, less serious injuries in their working environment, the increase in percentage, shows that management must train employees to identify, assess the risk and control it, as supervisors must keep records of risk findings. Respondents were dissatisfied with the scores for defensive measures as 60 % of 151 respondents attributed the failure on part of organizations to provide PPE for their workers and also lack of equipment guard protection.

Workplace conditions as 140 respondents which represent 56% score for poor working conditions that affects personnel health and safety, as management must show concern about the working conditions for personnel, since it can seriously affect the implementation of Safety Management System in most of the organizations. The action failures were as a results of human and technical errors, as 62% of 155 respondents scores indicates the occurrence of repeated mistakes, lack of clear direction from leadership to address the cause of action failures and personnel negligence. Supervisors and personnel must be cautious about every action and activities they undertakes in industrial operations. Safety performance monitoring, as 153 respondents scores represent 61%, which indicates the lack of records in occurrence on hazards and injuries on industrial activities. Supervisors must identify hazards in the working area, visit personnel, check work performance and inspection of equipment.

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