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Assess the Execution Engineer's Safety Culture at Workplaces

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Abstract: ***In many nations, the construction sector plays an integral role in social and economic development. Construction site safety is a key concern in both industrialised and developing countries. The Indian construction sector suffers from inadequate safety and health conditions due to a lack of safety regulations and a lack of awareness of workplace hazards. The goal of this study is to evaluate the safety culture among site engineers in the construction industry. This goal will be accomplished by achieving the following objectives. To begin, list the components and variables that affect safety culture. Second, assess the safety culture of the site's engineer in the construction industry and finally, build a framework to improve the safety culture in the construction industry.***

To achieve these goals, the research was grouped into three categories: literature review, questionnaire survey, and final verification of results. Data was gathered via a standardised questionnaire that was distributed to 50 site engineers. During the procedure, all completed questionnaires got a 100% response rate.

Management commitment, safety priority, safety rules, physical work environment, and personal appreciation risk are among the five components of safety culture that site engineers have a favourable perception of. Furthermore, the finding showed that if top management wants to strengthen and maintain a safety culture, they must make it a top priority, as well as analyse accident causes, inspect safety preparations, and teach personnel at the start of a new project. The focus of the research is to suggest to individuals and other stakeholders in the construction sector in order to improve the safety culture of site engineers.

Keywords: Safety Culture, Construction Sites, Site Engineers, Management, Safety Regulations, Analysis, Risks

I. INTRODUCTION

In comparison to other (labour-intensive) businesses, the construction industry has historically had a disproportionately high rate of debilitating injuries and fatalities for its size. Construction is a complex activity in which a variety of stakeholders are involved, all of whom are constantly challenged by the job's demands. Each job will have many safety and risk considerations, necessitating the establishment of quality and safety management systems. Typically, safety activities cost a set amount of money, whereas injury expenses are borne only if an injury occurs. Furthermore, injury costs will be high if there is a low priority on safety, whereas injury occurrences will be low if there is a high priority on safety.

The construction sector is complicated, with a wide range of trades and occupational groupings, as well as a large number of small organisations (less than 50 employees). Despite widespread agreement that injuries go unreported, injury rates in the workplace are high. False reporting of work injuries is a problem that may be highly common in small organisations. Carter and Smith (2001) defined an accident at work as a sudden event produced by an external cause that results in harm or death that occurs while at work. The industry has a reputation for being out of date and unorganized and for being unable to provide long-term employment by addressing the needs of its employees.

II. PURPOSE

In comparison to other countries, Indian's construction industry has a relatively low site safety record. In addition to the lack of a strong safety culture in the construction industry, phrases like safety climate, safety behaviour, safety systems, safety programmes, and safety management are not widely used in India, even among Arab countries, when compared to the United States or Europe. Furthermore, at all levels of management, there are major commitment issues with regard to safety. As a result, these reasons will serve as a motivating factor in choosing this topic to investigate the construction industry's safety culture and assess the level of awareness of its components, which include management commitment, safety priority, safety rules, education, training, and the environment. Every company is constantly looking for better solutions and a more sustainable environment. The construction industry's safety culture aims to keep the workplace safe for employees and assets.

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A strong safety culture can help with competitiveness in a variety of ways. Although a focus on safety is generally perceived as a non-productive expense mandated by law, it can also contribute to profit by reducing loss and increasing an organization's capital worth. The focus of this research is to evaluate the safety culture of site engineers in the Indian construction industry. Developing a framework to improve the construction industry's safety culture.

III. OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM

A management system is a proactive procedure that allows an organisation to achieve a set of objectives via the use of a well-organized set of components. An OH&SMS is a framework that enables an organisation to regularly detect and regulate its health and safety hazards, minimise the risk of incidents, assist in achieving compliance with health and safety regulations, and improve its performance over time.

A safer workplace, greater employee morale, lower expenses, stakeholder confidence, and more are just a few of the benefits. The majority of successful OH&SMS is built on a set of important elements. Management leadership, employee participation, hazard identification, hazard prevention and control, education and training, and programme evaluation and improvement are all examples of these.

Steps of an OH&SMS

An efficient OHSMS has five steps, which form a continuous cycle of improvement as indicated in the diagram. Each phase begins with a consultation.

A. Policy And Commitment From The Top Management

The policy is a broad statement of aim that impacts or guides future decisions. It serves as the foundation for the development of measurable objectives and targets, as well as the OHSMS.

B. Planning

Plan how to carry out the OHS policy, objectives, and targets so that hazards emerging from work activities can be identified, assessed, and subsequently controlled.

C. Implementation

Develop the capabilities and support mechanisms required to fulfil the OHS policy, objectives, and targets by implementing the plan.

D. Evaluation

To identify the effectiveness of risk management and, if necessary, take preventative and corrective action, measure, monitor, and evaluate OHS performance.

E. Review & Improvement

Review and improve the OHSMS on a regular basis with the goal of enhancing OHS performance.

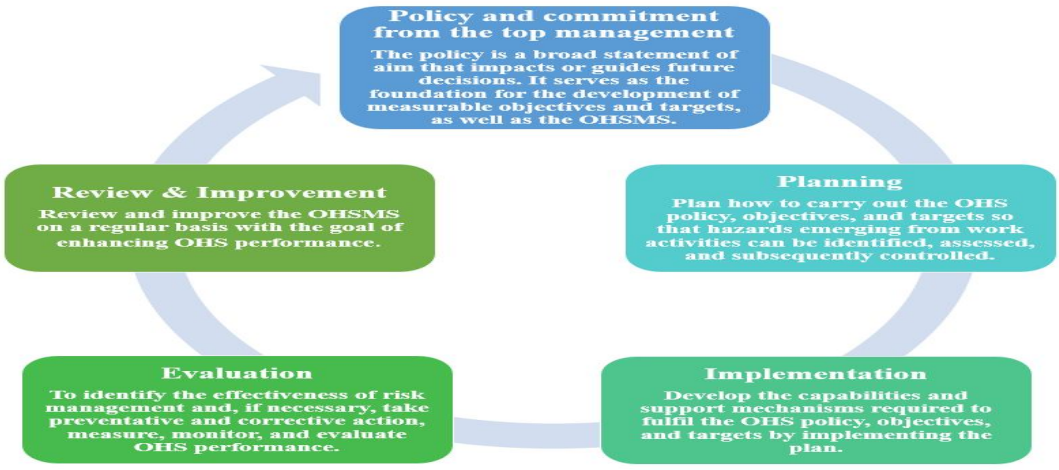


Figure 1. Steps of OH&SMS

IV. METHODOLOGY

Purposive sampling, one of the non-probabilistic approaches, was used for the sampling. A proportional stratified sampling method was used, as well as a simple random sampling method.

A structured questionnaire was used to collect information from construction sites. Following up on some of the responses included phone calls and reminders, as well as repeat visits. All the questionnaires were received during the research. The questionnaire received a 100% response rate. This is considered a strong response rate, which can be credited to the follow-up activities.

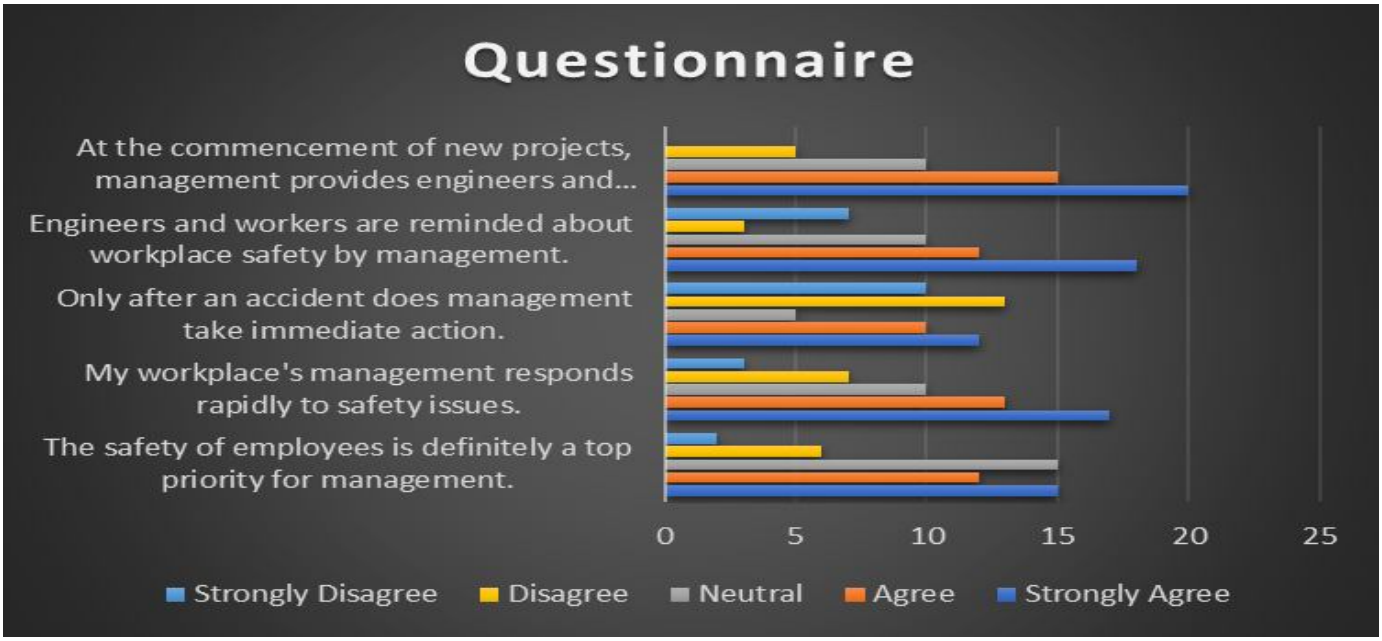
V. RESULT & DISCUSSION

Test Questionnaires

To answer the research's questions and verify questionnaire, a median will be generated for each of the phrases in the questionnaire, which show individual responses to the study. Grade (5) as a weight for each answer "Strongly agree," grade (4) as a weight for each answer "agree," grade (3) as a weight for each answer "neutral," grade (2) as a weight for each answer "disagree," and grade (1) as a weight for each answer "strongly disagree."

"Management commitment has a positive significance influence on safety culture," states the first questionnaire.

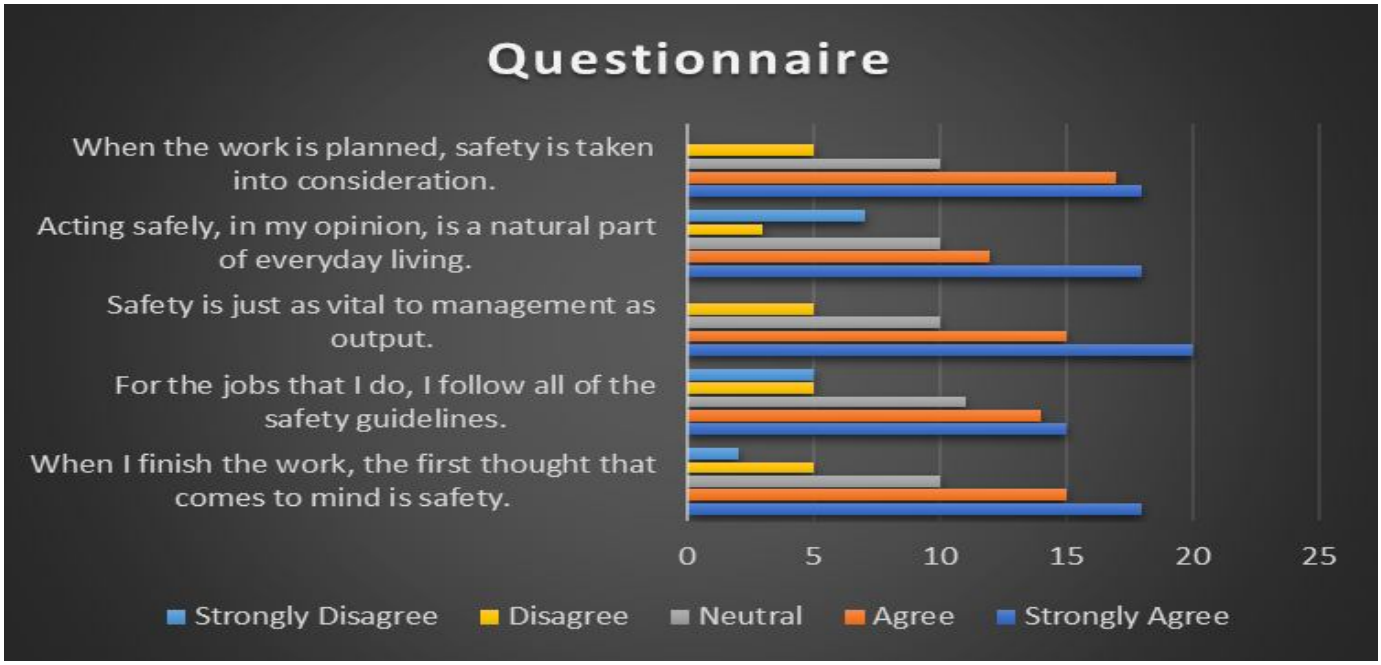
Questionnaire	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The safety of employees is definitely a top priority for management.	15	12	15	6	2
My workplace's management responds rapidly to safety issues.	17	13	10	7	3
Only after an accident does management take immediate action.	12	10	5	13	10
Engineers and workers are reminded about workplace safety by management.	18	12	10	3	7
At the commencement of new projects, management provides engineers and workers with training.	20	15	10	5	0



From the foregoing, we may infer that the first questionnaire, "Management commitment has a positive significance effect on safety culture," has been met and so that we agree.

"Priority of safety has a positive significance influence on safety culture," states the second questionnaire.

Questionnaire	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
When I finish the work, the first thought that comes to mind is safety.	18	15	10	5	2
For the jobs that I do, I follow all of the safety guidelines.	15	14	11	5	5
Safety is just as vital to management as output.	20	15	10	5	0
Acting safely, in my opinion, is a natural part of everyday living.	18	12	10	3	7
When the work is planned, safety is taken into consideration.	18	17	10	5	0

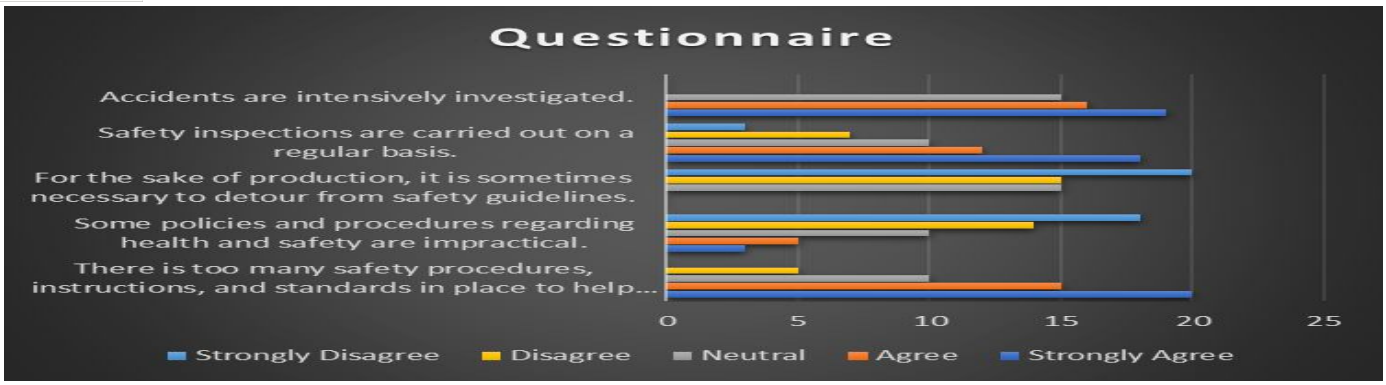


From the above, we can conclude that the second hypothesis, "Priority of safety has a positive significance influence on safety culture," has been confirmed.

"Safety rules have a positive significance influence on safety culture," states the proposed hypothesis.

Questionnaire	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
There is too many safety procedures, instructions, and standards in place to help minimize the actual hazards of the jobs you are responsible for.	20	15	10	5	0
Some policies and procedures regarding health and safety are impractical.	3	5	10	14	18
For the sake of production, it is sometimes necessary to detour from safety guidelines.	0	0	15	15	20
Safety inspections are carried out on a regular basis.	18	12	10	7	3
Accidents are intensively investigated.	19	16	15	0	0

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VI. CONCLUSIONS

Most site engineers show positive responses to the safety-related parts of culture, such as management commitment, importance placed on safety, safety rules, the actual working environment, and individual risk appreciation.

Construction site engineers have a moderate safety culture, according to the results of the investigation.

The findings also suggest that the following factors should be carefully considered in order to enhance site engineers' safety culture. Safety should be the top concern for management, "Training before the start of new projects," "Dissemination of safety related themes in various media like radio, newspapers, and the Internet," "Regular safety assessments," and "Thorough investigations of accidents."

VII. RECOMMENDATIONS

The government, construction companies, consultants (owners/designers), contractors associations, and associations of engineers will all be suggested in the recommendations as to what role they should play in order to improve the safety culture in Indian construction sectors.

A. Government Of India

The safety department should be given authority by the ministry of labor and welfare to carry out the following duties:

1) Creating a national framework with the assistance of all stakeholders and decision-makers to improve the safety culture in the construction sector.
2) To protect the rights of all construction employees, Indian safety rules and regulations such as BOCW act, factory act etc. need to be updated in accordance with international standards.
3) Establishing and deploying specialist committees to carry out recurring safety assessments and accident investigations
4) Work on passing legislation requiring all institutions (owners, consultants, businesses, and contractors) to include a clause addressing safety as one of the contract's clauses.
5) Drafting legislation to impose fines on anyone who violates safety regulations.
6) Holding safety-related (workshops, conferences, and seminars) in collaboration with consultants, building businesses, and engineering associations.
7) Publishing a regular safety magazine with assistance from construction businesses, academic institutions, consultants, and engineering organizations that will cover safety (news, statistics, accident investigations and any other related issues).

B. Construction Organizations

The data analysis shows that construction organizations should:

1) Prioritize safety as a top priority in order to establish a great safety culture.
2) Implement the safety standards and laws set forth by the Ministry of Labor.
3) Create effective safety communications (Periodic Safety assessments, accident investigation, encourage report unsafe conditions).
4) Conduct safety-training sessions, especially at the start of new projects.
5) Penalties for staff members who disregard safety rules.
6) Hold workshops, conferences, and seminars on safety in collaboration with the Ministry of Labor, consultants, engineering associations, and others.

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C. Eductaional Institutions

Educational institutions should involve providing guidance by mandating all engineering faculty students to take at least one safety course.

D. Consultants

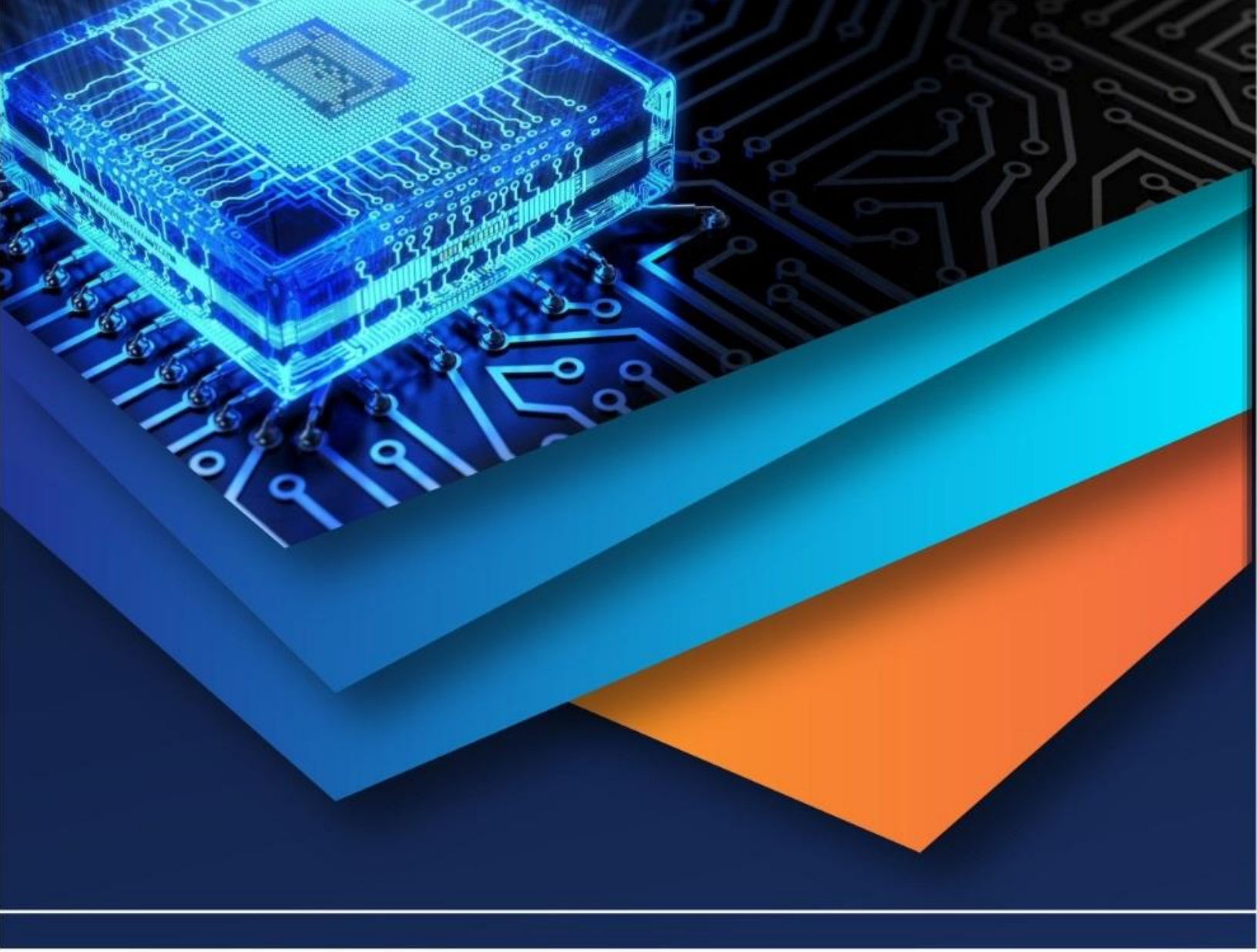
The construction industry may improve its safety culture with the help of consultants. The following are the responsibilities of consultants:

1) Consider safety during the design phase.
2) Include safety requirements and phrases in the project specifications.
3) during the process of awarding contracts, taking safety into account.
4) reviewing the safety records of the subcontractors and contractors, and rejecting any of them who have a poor safety record.
5) periodic safety evaluations.
6) To stop incidents from happening again, provide construction companies comments from the investigation and assessment.

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