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Impact of Organizational Safety Culture on Employees' Safety Behavior in Hydrocarbon Industries of Maharashtra

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Abstract

This study paper intentions to investigate the effects of safety culture of organizations in hydrocarbon industries in Maharashtra on the demonstration of safety behaviours among employees. since the hydrocarbon sector is carried out in risky areas it is important to promote a strong safety culture among employees. Three hundred employees from various hydrocarbon companies were surveyed quantitatively on their safety culture and behavior using pre-designed questions. To examine the connection between safety culture in the workplace and actual safety practices, researchers used Pearson's correlation test. The findings show a positive correlation, which means that safety culture is favorably impacted by organizational characteristics. We may say that safety culture and safety behaviors among employees go hand in hand for the reasons given below. A safety culture is a set of values that an organization upholds in order to make sure its workers are safe. The study shows that leadership commitment, employees' participation, and communication are the key factors in safety other-oriented culture. All the above facts support the need to promote safety culture within hydrocarbon industries in Maharashtra to improve the safety behaviour of employees which will result into less incidences and high organisational performance. Further research recommendations and guidelines for applying the findings within the context of the industry are also provided.

Keywords - safety climate, risk management, leadership commitment, employee involvement, workplace safety

Introduction

Over the last few years the hydrocarbon industry has attracted much attention of the wider community given its essential contribution to the world economy and the inherent hazards involved in the sector. Hydrocarbon industry being one of the biggest industries of Maharashtra, it contributes significantly to the states gross domestic product. But it is also marked by high risk activities that can lead to some risks regarding the safety of the employees and the vicinity. Since such an industry carries so many risks, the safety of the employees is paramount in avoiding dreadful incidents that may lead to loss of lives, destruction of the environment and commercial losses.

Organizational safety culture refers to the beliefs, thoughts and feelings towards safety of the employees and organizations safety policy at workplace is a new field that has been noted to have a positive correlation with the safety performance of the industries especially those industries that are regarded as high risk operation industries such as hydrocarbon extraction and processing industries. Safety culture is therefore defined as the safety values of an organisation, as well as how various actors in an organization think about safety and act accordingly. A robust safety attitude means that workers engage and act in ways that would ensure their own protection as well as those of their peers' protection at the workplace.

Studies have shown that if an organization has a strong safety culture, the resultant accident rate would be low and safety performance improved. It also highlights the practical elements that support initiative pillars, including staff motivation, improved communication and leadership commitment. In the hydrocarbon sector, employees operate under conditions that are adverse at best and hence it is crucial for organizations operating in the sector to deepen a positive safety culture.

Finding out how safety culture in the workplace influences workers' actions to avoid harm is the driving force behind this study in Maharashtra's hydrocarbon sector. In order to determine how safety culture may be best used to improve safety performance, this research aims to investigate the relationship between safety environment and safety culture. It is believed that the outcomes of the current study will extend the body of knowledge on safety management, and will provide specific guidelines for improving the practices in the field of safety in the hydrocarbon industry. In doing so, the research seeks

to highlight the importance of maintaining a behavioural safety culture as part of the strategy for risk mitigation and the welfare of workers in high risk sectors.

Literature review

Organizational safety culture has been accepted far and wide as a critical factor influencing safety performance within high risk environments. Modern researches make a tendency to investigate how the safety culture it is possible to affect the employees' safety activities, especially in hydrocarbon industry. For example, Cooper (2020) explain that safety culture be strong enough to engage the employees in the practice of safety measures aimed at reducing the rate of accidents. The author notes that a sound safety climate encourages employees to take accountability for safety and safety performance consequently improves.

Safety culture within organizations has been reported to influence employees' safety behaviors by a number of research studies. In the systematic review of DeJoy et al. (2021), they concluded that safety culture is directly connected to safety behaviors and believe that increases in perception on safety climate among employees foster the practice of safety standards. Following the same context Fang et al. (2021) observed that in the hydrocarbon sector which is regarded as high risk area the safety behavior of employees is proportional to the developed safety culture expectations.

In this study, it has been ascertained that leadership had a critical role to play in the rights, as well as the creation and sustenance of safety culture. According to Mearns and Yule (2021) safety wise leadership involve constant demonstration of commitment, sharing of issues to do with safety. This is in agreement with Neal and Griffin (2020) who posit that larger amounts of transformational leadership improve the safety culture and safety actions of personnel within organizations; more so, in high risk organizations.

It was also noted that for an organization to have a good safety culture, employees should embrace safety issues by coming up with their commitments. Also using employees' participation in making decisions related to safety not only creates better safety culture but also increases employees' job satisfaction according to Niskanen (2020). It has been associated with safer situation within the hydrocarbon industry as supported by the study by Yorio and Wachter (2020).

Safety climate is a part of the broader safety culture concept that has, however, featured prominently in the recent literature. According to Zohar (2021), perceptions of safety climate in organizations affect the safety behaviour of employees which reemphasises that safe climates result in better overall practices. Also, according to Guldenmund (2022) indicated that organizations where there are common and open reporting of safety issues they record high levels of compliance with safety measures among the employees.

The literature again and again emphasizes the need for a positive organizational safety culture in combating risks in hydrocarbon industries. The study shows that increasing leadership commitment, employee involvement, and the clear safety culture concept can lead to a better understanding of the desirable safety attitude and show superior safety behaviour, and, thus, better safety performance and incident rates.

Thus, the current review of the literature evidence concerns relations between structural and behavioural aspects of organisational safety culture in high risk industries with reference to the hydrocarbon industry. This study endeavors to proceed from these findings by considering hydrocarbon industry factors in Maharashtra so as to provide key recommendations for enhancements in safety management to theoreticians as well as practitioners in the applied field.

Objectives of the study

- To examine the relationship between organizational safety culture and employees' safety behavior in hydrocarbon industries of Maharashtra.
- To identify key factors within organizational safety culture that influence employees' safety behavior.
- To evaluate the impact of leadership commitment on safety culture and employee safety behavior.

Hypothesis of the study

H_0 (Null Hypothesis): There are no significant key factors within organizational safety culture that influence employees' safety behavior in hydrocarbon industries of Maharashtra.

H_1 (Alternative Hypothesis): There are significant key factors within organizational safety culture that positively influence employees' safety behavior in hydrocarbon industries of Maharashtra.

Research methodology

This study uses a survey research approach to examine how safety culture in organizations impacts worker protections in Maharashtra's hydrocarbon industries. Organizational safety culture and employee behavior were assessed using a well-structured questionnaire that included pre-existing measures. Anentire 300 employees from the hydrocarbon sector were contacted and responded to the survey, covering all necessary demographic aspects, as well as differing job roles and levels of experience. The data collected was done so with the help of an online survey tool that would help capture data from a wider population and ensure data anonymity. To analyze employee safety behavior with the factor of organizational safety culture, software tools like SPSS were used. For purposes of description, mean, median and standard deviation were used whereas to test the hypothesized relationship, Pearson's correlation coefficient was used. The research design aims at identifying the antecedents of safety behavior in order to make concrete suggestions to improve safety climate in the hydrocarbon sector.

Data analysis and discussion

Table 1 – Descriptive statistics

Variable	**Mean**	**Median**	**Mode**	**Standard Deviation**	**Minimum**	**Maximum**
Age (years)	36.2	36	35	8.0	22	58
Years of Experience	9.8	10	7	5.5	1	30
Education Level (Mode)	-	-	Graduate	-	-	-
Gender (Mode)	-	-	Male	-	-	-
Safety Behavior Score	4.3	4.4	4.5	0.5	3.0	5.0
Productivity Score	4.1	4.0	4.2	0.6	2.5	5.0

Data from a survey of 300 people working in the hydrocarbon sector are shown in Table 1. Respondents are a somewhat senior workforce, with an average age of 36.2 and a median of 36 years. The sample has a wide demographic makeup with an age range of 22 to 58 years. The personnel have a reasonable degree of industry experience, with a mean of 9.8 years. The shortest documented experience is merely 1 year and the highest is 30 years.

Although the education level is not provided numerically, it suggests that most responders have a doctorate degree or above, which is critical in a highly difficult field like hydrocarbon. As is common in this industry, the mode is male, indicating that men make up the majority of the workforce.

With a mean score of 4.3 and a standard deviation of 0.5, the safety behavior score shows that workers often display good safety behaviors, especially as the scores get closer to 5. Additional evidence of this trend toward safer work practices is shown by the median (4.4) and mean (4.5) ratings. Similarly, workers are very productive, according to the productivity score (4.1 on average, 0.6 standard deviation), which is somewhat below the safety behavior ratings but still above average. Productivity scores range from 2.5 (indicating considerable fluctuation in performance) to 5.0 (indicating instances of perfect productivity). The petroleum industry seems to have a competent and safety-conscious staff according to the descriptive data. This bodes well for the possibility of successful safety culture efforts that will lead to even better safety behaviors and productivity results.

Table 2 – Correlation analysis

Key Factors	**Pearson's Correlation Coefficient (r)**	**p-value**	**Interpretation**
Management Commitment	0.68	0.001	Significant positive correlation ($p < 0.05$)
Communication	0.62	0.002	Significant positive correlation ($p < 0.05$)
Employee Involvement	0.65	0.001	Significant positive correlation ($p < 0.05$)
Training and Education	0.57	0.005	Significant positive

Key Factors	**Pearson's Correlation Coefficient (r)**	**p-value**	**Interpretation**
			correlation ($p < 0.05$)
Safety Policies and Procedures	0.64	0.002	Significant positive correlation ($p < 0.05$)
Safety Performance Feedback	0.61	0.003	Significant positive correlation ($p < 0.05$)

Employees in Maharashtra's hydrocarbon sectors were the subjects of a correlation research designed to identify any links between certain organizational safety culture factors and their actual safety-related actions. The findings are shown in Table 2. The results show a number of strong positive correlations, all of which point to the fact that workers' safety behaviors increase when certain parts of the company's safety culture are strengthened.

With a p-value of 0.001 and a Pearson's correlation coefficient (r) of 0.68, the largest association is shown between management commitment and employee engagement in safe practices. This suggests that when management displays a strong commitment to safety, workers are more likely to follow suit. Likewise, there is a strong correlation between communication and safety ($r = 0.62$, $p = 0.002$), suggesting that when safety regulations and expectations are well communicated, it leads to improved safety behavior.

When workers are actively engaged in safety activities, they are more likely to adhere to safe practices. This is supported by a substantial positive connection ($r = 0.65$, $p = 0.001$) between employee involvement and safety. Employees' comprehension and adherence to safety protocols are both improved by thorough training programs, according to the Training and Education correlation ($r = 0.57$, $p = 0.005$).

There are significant relationships between safety performance feedback ($r=0.61$, $p =0.003$) and safety policies and procedures ($r =0.64$, $p =0.002$). This suggests that clear safety policies and constructive criticism of safety performance are essential for developing safe habits.

In sum, the findings highlight the significance of fostering a robust company safety culture. Investing in safety culture not only improves compliance but also promotes a proactive safety environment within the hydrocarbon industry. Each component greatly enhances workers' safety behavior. Organizational initiatives may be informed by these results to promote a safety culture that values the well-being of employees and operational efficiency.

Conclusion

The research question was to establish the effect of organisational safety culture for safety behavior amongst employees of the hydrocarbon industries in Maharashtra. The results highlight a significant association with safety culture components including management commitment concerning safety, communication, employees' participation, training/education, organizational safety policies and procedures, and finally safety feedback and performance and the employee's safety behaviour.

The study, conducted on factors affecting the safety practices, identified the key factors, and demonstrated their impact on the extent to which workers complied with safety measures; therefore, safety in the workplace needs to be nurtured to ensure effective while culture impacts on the safety rates and need to be monitored to ensure that it enhances safe work practices on the job. Overall, several factors were found to predict safety climate scores, with management commitment alone proving to be the most significant factor in the current study; emphasizing on leadership involvement in the enhancement and the sustaining of safety culture. Also, the conclusions show the importance of communication and motivation of employees to create the safety culture.

In conclusion, the study finds that there is strong evidence of the fact that improving organizational safety culture can bring positive change in the safety behaviour of employees and will help decrease accidentally related loses in the hydrocarbon industry. These findings provide valuable implications for management with the primary focusing on the continuous investment on the safety culture for benefits of employees and for success of operations. In fact, further research could focus on the long term impact of these programs, as well as their possibility for expansion to other segments of the industry.

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