

The Influence of Human Factors on Petroleum Operation Accidents

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Abstract: To understand the relationship between maintenance personnel's effectiveness and operational reliability of oil operations organizations. The existence of engineering measures evaluates the effectiveness of equipment maintenance and reliability. These measures are usually retrospective and may not provide insight into the factors that hinder system reliability. Staff's perception of organizational efficiency may provide a predictive measure, so the article discusses maintenance personnel's views on human-caused accidents through questionnaires and other methods to improve the understanding of human factors that affect system reliability. Keywords: goldmine, flotation, constant parameters, surface methodology, beam dimensions

1. INTRODUCTION

Studies of the industrial environment show that human factors have caused 50% to 70% of industrial failures. There is a large amount of literature dedicated to measuring the contribution of human factors to accidents that occur in high-risk industries, as well as other forms of organizational failure, especially those involving human error. Early pioneers in the field of human factors conceptualized this relationship, with specific factors leading to human-induced failures in specific areas. Later studies used early research methods to study methods for identifying specific human factors that led to accidents and other types of workplace failures. Some scholars have developed their Human Factors Survey Tool (HFIT), based primarily on Rasmussen's taxonomy and applying their methods to analyze accidents in the oil industry. Similarly, methods have also been developed for the analysis of human factors that cause maintenance-related failures in the aerospace and nuclear industries [1]. In further studies, some scholars have also used HFIT survey methods to determine that major human factors have led to maintenance-related failures in petroleum operations.

2. THE CAUSE OF THE ACCIDENT

Focus on work needs and workplace constraints, consider technologies and groups weaving complex systems to make decisions. In a simple "linear" system, you can learn about the system status and how to run the system. However, as the system becomes more and more

complex, the result of the decision becomes more and more difficult to predict. Therefore, the closest collaborators in the workplace system are most likely to judge “emergency” assets in terms of safety and reliability. They believe that the view of the cause of failure (or the opposite reliability) depends on the perspective or framework of the person involved [2]. The perception of the outcome of the decision depends, at least in part, on the atmosphere within the working group or the cultural differences across the organization. Rather than looking for the cause of failure, it is better to gather multiple narratives from different perspectives of a complex system.

3. ACCIDENT INVESTIGATION QUESTIONNAIRE

The questionnaire survey analyzed the impact of human factors on the reliability of the maintenance of oil industry companies. The personnel involved in the investigation included the maintenance technicians, maintenance supervisors, and maintenance coordinators/planners of a large oil production company. Participants from 9 institutions from three different workplaces were invited to participate in the study. Of the 133 participants, 69 (51.9%) completed a complete questionnaire, including a written comment on maintaining efficiency. When analyzing the respondents’ comments, the initial goal was to provide maintenance personnel with an opportunity. By using thematic analysis methods, there is a significant relationship between the perception of maintenance personnel and the quantitative measurement of workplace reliability, ie, the average time between failures. These qualitative data may increase the indicators of emerging performance to the commonly collected quantitative data to assess the role of human factors in the organization [3].

4. SURVEY RESULTS AND CONCLUSIONS

4.1 Survey results

The results of the survey show that the analysis of the perceptions of human factors in the workplace by the respondents can provide a reliable indicator of the relative performance of their workplaces in terms of system reliability.

In thermal processing of residual materials with a various origin and predominantly for fire treatment of hazardous wastes rotary kiln are employed. In metallurgy they serve for heating of solid particles like oxide ores reduction, limestone calcination, cleaning of dwarfs from machine oil. This means that future research on workplaces and job performance will benefit from text-based comments from staff who are asked to relate to the information sought in the study, provided that the content of the review is subject to a rigorous topic analysis.

The limitations of this survey include the reliance on a single project to supplement the closed-ended problem data obtained from the same survey. The limitation of the qualitative approach is that it particularly depends on the level of motivation of employees, their ability to analyze performance, their workplace, and their opinions. Because of the generous reward system, workers in the oil industry are often well-incented. Due to the technical requirements of working in high-risk industries, they will also have a high level of education. Therefore, the

conclusions drawn from this study may not be applicable in other industries. An interesting comparison may be to use this method in a less dangerous industry, or in an organization with low wages or worker education.

4.2 Survey conclusion

The advantages of this study include the comparison of objective reliability data and personnel perception data and the analysis of different levels of organization. The method also reveals a high degree of awareness of the reliability and effectiveness of the workplace. As observed in this study, employee behavior may indicate future reliability and provide a leading indicator of their future work performance. The importance of understanding the "weakness" of potential workplace systems was discussed and the staff of the study seemed to prove this. In contrast, the standard method of measuring workplace reliability is often a lagging indicator that relies on past results or performance and cannot be predicted.

Survey respondents used the opportunities provided by the survey to express their views on various aspects of the workplace, which affected their ability to perform their work. Therefore, although not all of the comments are related to the research questions they raised, according to the high recovery rate (55.6% of the respondents provided by the survey respondents), the maintenance personnel obviously appreciated the opportunities offered by the open survey questions. And give their opinions and suggestions to their workplaces.

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