

Analysis of Work-Related Stress on HSE Department Employee in Concentrating Division of PT Freeport Indonesia

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Abstract. Work stress can arise from within or from outside the organization, the cause of which is often felt by workers. Work stress is included in occupational diseases and generally comes from the amount or lack of understanding of the work. The purpose of this study is to diagnose work stress on employees in the HSE Department of the Concentrating Division of PT Freeport Indonesia, which is assessed through 6 aspects contained in the Regulation of the Minister of Manpower Number 5 of 2018. Type of research is semi-quantitative, with a cross-sectional research design. The research method uses a survey, and the sampling technique used is a saturated sample. The survey results show that the overall level of work stress on employees is 2.81. This value indicates that the level of work stress felt by employees of the HSE Division is classified as mild, because the score obtained is less than 9. The mean aspect of role ambiguity is 2.73; role conflict 2.76; quantitative work overload 2.75; qualitative work overload 2.87; career development 3; and responsibility towards others 2.74. Based on these values, it can be concluded that each employee of the HSE Department has high accountability from each function as well as the division of personal responsibility to regulate the determination of work priorities and rest periods. However, the majority of employees still feel that there are some tasks that are deemed unnecessary, the existence of high skill expectations from superiors, and the lack of opportunities for promotion or career development within the organization which can be a stressor in the department.

1 Introduction

In this disruption era, there have been massive environmental and technological changes in all aspects of human life, including the mineral mining industry. The decline in quality and the increasing complexity of ore rocks, especially those from underground mines, require more water, energy, and sophisticated technology for processing. This is a challenge for the

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mineral mining industry [1]. Furthermore, the company is still adapting to various easing policies for the COVID-19 pandemic while remaining vigilant in the event of further restricting measures. This certainly adds to the challenges faced by every industry [2].

These challenges are closely related to the human resources (HR) in the organization. Good quality HR will improve performance and companies can face various existing problems [3]. However, efforts to maintain the quality of human resources have various challenges, such as stress, which is an adaptive response mediated by individual characteristics. It is a consequence of actions, situations, or events that cause physical and/or psychological demands [4].

Work stress is illustrated as a combination of role conflict, excessive workload, and ambiguity with negative impacts on employees. These impacts include decreased work commitment or job satisfaction leading to increased workplace accidents and safety violations [5]. Work stress is a risk that arises from psychosocial hazards, which are frequent problems in the mining industry [6]. A study in Australia found that psychological distress was significantly experienced by mining workers compared to those in other fields [7].

The characteristics of the mining industry which include labor-intensive, high worker mobility, operations that have to run 24 hours, and mining locations in remote areas can be a source of stress. This is because employees have to be away from home, working for long hours, the economic demands of the family, the risk of reducing the number of workers, and social isolation [6,8] This condition is exacerbated by the closure of recreational facilities such as karaoke, fitness centers, sports fields, swimming pools, restaurants, and others during the COVID-19 pandemic [9].

The HSE Department has a major responsibility for the management of operational safety and the mining environment. This is particular for a large processing plant consisting of four factories with specific and dynamic hazards and risks including dust, noise, vibration, lighting, work climate, and hazardous chemicals. The current construction of the concentrator 5 plant is a challenge for the department. Work risk factors, new operating patterns, construction targets, and workload during the commissioning phase are new things to be identified by the employees. Furthermore, the new working time conditions and resources make it necessary to identify the level of work stress.

2 Methods

This is a semi-quantitative study with a cross-sectional design and a saturated sample size. Also, it is descriptive and aims to describe employees' work stress in the HSE Department. The measuring instrument used is a job stress questionnaire based on the Minister of Manpower Regulation No. 5 of 2018. The factors discussed include role ambiguity and conflict, quantitative and qualitative overloads, career development, and responsibility towards others. This will analyze the average calculation results of each individual, sections in the HSE Department, the average of each stress factor, and the average overall stress factor. The category of cumulative results will show the level of stress which includes mild (score < 9), moderate 10-24 (score 10-24), and severe (score > 24).

3 Results

3.1 Distribution of HSE Department Employee Characteristics

Table 1 describes the sample characteristics of the HSE department employees in this study. They were dominated by males (85.7%) compared to females (14.3%). Furthermore, the department is dominated by employees from the safety section (42.9%) followed by safety

training (28.6%), environmental (14.3%), human development (9.6%), as well as IH and Communication (4.6%). 15 employees have work experience > 5 years (71.4%) and 6 have < 5 years (28.7%).

Table 1. Distribution of HSE Department Employee Characteristics

Variabel	N (Employee)	Percentage (%)
Gender		
Men	18	85,7
Women	3	14,3
Section		
Enviromental	3	14,3
Safety	9	42,9
Safety Training	6	28,6
IH and Communication	1	4,6
People Development	2	9,6
Length of Employment		
>5 Years	15	71,4
< 5 Years	6	28,6

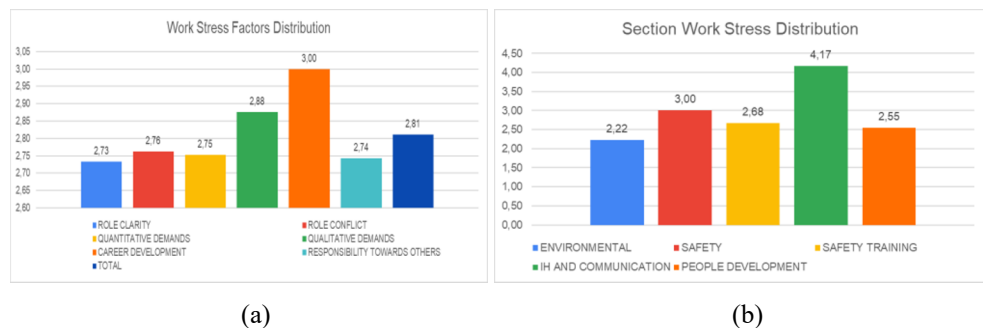


Fig. 1. (a) Distribution of HSE Departemt Work Stress Factors, (b) Work Stress Distribution at HSE Department Section

3.2 Overview of Work Stress based on Factors at the HSE Department

Figure 1(a) describes the total accumulated work stress factors experienced by the employees. The results of the role ambiguity factor showed 2.73 which significantly indicates mild stress. The role conflict factor had 2.76, quantitative overload had 2.75, and qualitative overload had 2.88 which denotes mild stress.

The role conflict showed the highest number among other factors, which is 3. However, it had a score of <9 which indicates mild stress. The factor of responsibility for others showed 2.74, implying mild stress. Overall, the average factor has a cumulative number of 2.81 indicating mild stress on each factor in the HSE department.

4 Discussion

The variety of works, especially in the construction of a new mineral processing plant, and the change in work shifts to 6 weeks on-site and 2 weeks off-site do not necessarily indicate high stress for the employees. This is revealed from the analysis results which showed the average value for each stress factor is <9 or cathegorized as mild.

Out of the 6 existing factors, role conflict has the highest number. This is due to high turnover and no recruitment during the COVID-19 pandemic to date. Handling of health promotion related to work stress is not optimally carried out. Preventive data collection to determine work stress factors has been carried out in previous studies but the intervention has not been optimal [10]. Therefore, health promotion programs in the workplace that target stress management need to convince employees about the value and participation benefits to ensure high enrolment rates and generate great benefits [7].

The most influential role ambiguity factor is the purpose of the tasks and work performed by the employees. This is of concern because it has the highest mean among other questions related to role ambiguity. This ambiguity also occurs when an individual receives insufficient or unclear information about how to perform a task or lacks feedback about work progress [5].

The role ambiguity factor in the HSE department has been well-conditioned. This is evidenced by the employees who have understood their respective roles listed in accordance with the job description. The division of roles is an important factor to consider between employees and contractors, as well as assigning tasks in the same shift [7].

The dominant role conflict factor that appears is that employees feel they have carried out unnecessary tasks and feel they are doing work that is accepted by one person but rejected by another. Operators who experience stress due to work demands and other factors will be more prone to mental exhaustion. In contrast, those who experience mental fatigue due to work pressure and personal characteristics are more likely to have acute and chronic stress [11].

The quantitative workload is the amount of work and the speed required to complete the task [12]. The most dominant quantitative burden factor that appears in this study is that employees feel they have a high responsibility to complete projects and work at the same time. A greater workload in terms of time and magnitude can lead to stress [5]. However, the employees feel they can effectively manage their work and rest patterns. This is evidenced by the continued achievement of work in 2021 in all sections. Entertainment and sports facilities are one of the factors that support productivity during breaks.

The most dominant qualitative workload factor is the high expectation of abilities and skills. With economic and social developments, working conditions and procedures have changed dramatically. Workers are increasingly experiencing stress due to a complex work environment with high requirements and challenges [13]. In the HSE department, dynamic work requirements and high safety require employees to adapt to every condition. In contrast, employees do not feel any difficulties related to the tasks being carried out. This is because the majority (71.4%) have more than 5 years of experience which made them adapt to daily work.

The most dominant career development factor is the opportunity to advance in the organization. Low job support, rewards, recognition, and control are the factors most related to work stress [14]. An uncertain career path is a problem felt by employees with long experience. Even though they believe the opportunity for promotion is low, the potential for competency advancement in the form of experience is seen to be beneficial.

The most dominant factor of responsibility towards others is the ability to act or make decisions that affect the welfare between employees and superiors. The factors of role overload and job safety have a stronger correlation with context-free psychological tension than job burnout. Meanwhile, role conflict, ambiguity, interpersonal conflict, and low work support show a stronger relationship with job burnout than individual psychological tension [14]. Employees feel that the responsibility to help subordinates is not a big problem in the organization.

Based on the results, IH & Communication is the section with the highest stress level even though it is still in the mild category. This is because the focus is divided into two with

inadequate employee resources. Furthermore, the number of special projects in the field with short durations requires IH & Communications section employees to be adaptive. Safety is the second section with the highest stress level. Complex work with external challenges such as accidents make the workload of employees to be unpredictable. System data processing from the field, routine work inspections, and implementation of fatality prevention programs in each unit are carried out by the safety section. Also, environmental is the section with the lowest stress level compared to others. Although it quantitatively has the lowest stress level, weekly work schedules and field inspections are continuously carried out.

5 Conclusion

Based on the results, it can be concluded that the stress level experienced by each employee in the HSE Department is low. The most perceived risk factor for work stress is role conflict. In general, the employees have high accountability both in the division of tasks from each function and the division of personal responsibility for managing rest periods and determining work priorities. Although the majority still feel some tasks are unnecessary, the existence of high skill expectations from superiors, and the lack of promotion opportunities within the organization can be a stressor in the HSE department.

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