Analysis Of the Costs of Preventing Work Accidents in The Implementation of The Occupational Health and Safety Management System in The Palopo City Arts and Sports Building Construction Project

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Abstracts: The construction industry is characterized by many small companies working with limited resources and substandard safety management systems. The aim of this studyto analyze the costs of preventing work accidents in implementing the work health and safety management system in the arts and sports building construction project in Palopo City. This research uses the methodmixed qualitative and quantitative research with descriptive analysis research design. The selected samples in this research were project contractors, K3 experts and several workers who almost had work accidents. ResultsThe costs incurred by the company do not meet the requirements of the PUPR ministerial regulations in Circular Letter Number 11/SE/M/2019. Based on the analysis of tangible benefits, the total cost of treatment and the total cost of project delays is IDR 317,859,200. And based on the BCR analysis the results obtained are B/C ≥ 1 for the benefits realized.

Keywords: Work accidents, Costs, Benefits, Prevention, SMK3

1. INTRODUCTION

The construction industry is notoriously bad when it comes to occupational health and safety (K3). Data shows that one of the industries with the largest accident rate is construction (Ahn et al., 2022; Jin et al., 2019). According to the 2019 ILO report, work-related accidents or diseases claimed the lives of more than 2.78 million people in 2018. According to the data, increasing prevention spending will reduce the level of risk, which in turn reduces the number of work accidents (Sousa et al., 2021) . However, it is still unclear how much accidents can be influenced by prevention efforts and how prosperous a company will be in the long term. According to several studies (Wang et al., 2019), the construction industry is characterized by many small businesses working with limited resources and substandard safety management systems. Evidence shows that these companies often ignore all the costs of safety, its impact on their financial performance, and ultimately, the threat to their existence (Cagno et al., 2011). Therefore, it is important to investigate to what extent accidents experienced by employees, caused by the OSH management of these companies, can be used to justify their continued existence.

An examination of contemporary research on the financial impact of occupational safety management systems on OSH prevention. Construction organizations can gain lasting competitive advantage through high safety performance with the help of effective safety management. In addition, it is widely recognized that substandard performance in the area of OSH, such as a high rate of accidents per worker, can result in costs so high that entire

businesses can lose revenue, thereby endangering a company's financial stability and even its very existence. Long term or medium term (Kim and Park, 2021; Sousa et al., 2021).

The Palopo City Arts and Sports Building was built by CV. Principal Construction Partners, and the author used this information to draw a case study on its construction. The Arts and Sports facilities will be three stories high and function as service facilities, in accordance with DED procedures and the building construction has adopted SMK3. Based on the current state of the project and the data collected, it can be concluded that the project has the potential to study the costs and benefits of occupational safety management systems. To calculate and assess costs and occupational health and safety management systems for the Palopo City Arts and Sports Building project,

RESEARCH METHODS

This research methodology uses a mixed methods design that combines qualitative and quantitative approaches, specifically using a sequential mixed methods strategy, specifically a sequential explanatory strategy. The research methodology used is descriptive analysis, which seeks to provide a comprehensive picture of the facts, characteristics and relationships between the phenomena studied (Iqbal, 2020). This methodology has a higher level of complexity compared to collecting and analyzing two different forms of data. This methodology includes the combined function of both research methodologies, resulting in overall research strength that surpasses qualitative or quantitative research alone (Creswell, 2019).

The research that will be carried out will take a case study of the Palopo City Arts and Sports Building Construction Project with CV. Main Construction Partners as contractor.

The data presented in this research was collected through analysis of existing data sources, including direct interviews with the Head of the Health, Safety and Environment (HSE) Division Office, as well as examination of relevant project documents. The primary data collected in this research is of a qualitative type including several elements, such as observations, work methodology for project implementation, safety measures in the workplace, and documentation of administrative project data. This document relates to work instructions relating to occupational safety and health, as well as other relevant matters.

RESULTS AND DISCUSSION

Total Cost Analysis of Occupational Health and Safety Management Systems

Table 1. Details of the Total Cost of the Occupational Health and Safety Management System

No	Items	Amount
1	Details of RKK Preparation Costs	9,082,613.29
2	K3 Socialization and Promotion	500,000.00
3	Work Protective Equipment	1,350,000.00
4	Personal protective equipment	3,800,000.00
5	Insurance	2,500,000.00
6	K3 Personnel	5,000,000.00
7	Health Facilities	500,000.00
8	Signs	500,000.00
9	K3 Risk Control	850,000.00
Total		**24,082,613.29**
Contract value		**6,954,000,000**
Percentage of Contract Value		**0.034%**

Source: Primary Data 2023

Table 1 shows that the SMK3 costs for the Arts Building Rehab Construction project in the RAB recapitulation attached to the table above are IDR. 24,082,613.29 with a percentage of 0.034% of the total project contract cost. The K3 percentage indicator is 1.5% of the project value according to the Circular Letter of the Minister of PUPR number 11/SE/M/2019.

Analysis of Tangible Benefits of Occupational Health and Safety Management Systems

In accordance with the Regulation of the Minister of Health of the Republic of Indonesia Number 52 of 2016 concerning Health Service Tariff Standards in the Implementation of Health Insurance Programs, a study of BPJS treatment prices using the INA CBGS reference was carried out.

Table 2. Standard Health Cost Tariffs at Advanced Health Facilities (INA-CBG's) for Inpatient Government Hospitals

INA-CBG code	Description of INA-CBG	Class 3 Fare	2nd Class Fare	1st Class Fare
M-1-130-III	Foot Procedures (Severe)	29,474,000	35,368,800	41,263,600
U-1-11-III	Complex Neck and Head Procedures (Severe)	23,033,600	27,640,300	32,247,100
G-1-20-III	Cranial and Peripheral Nerve Procedures (Severe)	31,412,300	37,694,700	43,977,200
Z-4-12-III	Factors Affecting Other Health Status (Severe)	9,586,500	11,503,800	13,421,100

Source: Regulation of the Minister of Health of the Republic Number 52 of 2016)

Three treatment procedures were obtained on the premise that the construction process used class 3 inpatient treatment costs because two respondents almost had an accident due to falling from a height.

Table 3. Analysis of Treatment Costs for Falls from Height

Treatment of Falls from Height	Cost
Foot Procedures (Severe)	29,474,000
Complex Neck and Head Procedures (Severe)	23,033,600
Cranial and Peripheral Nerve Procedures (Severe)	31,412,300
Factors Affecting Other Health Status (Severe)	9,586,500
Total Cost	93,506,400
Total Cost of 2 Workers	187,012,800

Source: Primary Data 2023

Two treatment procedures were achieved with the assumption of using class 3 inpatient rates because two respondents almost had an accident due to a heavy object hitting their head.

Table 4. Analysis of Medical Costs of Being Hit by a Heavy Object

Treatment of being hit by a heavy object	Cost
Complex Neck and Head Procedures (Severe)	23,033,600
Cranial and Peripheral Nerve Procedures (Severe)	31,412,300
Factors Affecting Other Health Status (Severe)	9,586,500
Total Cost	64,032,400
Total Cost of 2 Workers	128,064,800

Source: Primary Data 2023

From table 3 and table 4 it shows that the total medical costs for the 4 workers who were protected due to the use of PPE and APK were IDR 315,007,600.

Cost Analysis

Benefit Cost Ratio analysis is not researched as a structural technique because project operations depend on SMK3. Therefore, SMK3 must be implemented and be useful for project progress regardless of whether the findings can be achieved or not. Here's how BCR analysis is done:

$$\frac{Total\ Manfaat}{Total\ Biaya} = \frac{B}{C} \geq 1$$

Information

B/C ≥ 1, Eligible

B/C = 1, Break Even

$$\frac{317.859.200}{3.800.000} = 83.647 \geq 1$$

The purpose of this research's BCR (Benefit Cost Ratio) analysis is to find out how much benefit is realized compared to the costs incurred. By understanding this relationship, it is hoped that regulations relating to SMK3 will be more likely to be implemented.

Analysis of the Difference in Costs and Benefits of SMK3

The purpose of difference analysis is to determine the disparity between the benefits received and the expenditure incurred. The indicators assessed show that the value of implementing SMK3 is running well if the benefits obtained exceed the costs incurred. The elements of procurement of PPE and APK are the main issues in this research which can be used as a benchmark for differences, and are analyzed as follows:

Benefits obtained: Rp. 317,859,200

Costs incurred: Rp. 3,800,000

Benefits – Costs

Rp. 317,859,200 - Rp. 3,800,000= Rp. 314,059,200 (+)

The final result is a difference of Rp. 314,059,200, showing a good perception of cost advantages. This is intended so that SMK3 can be implemented as well as possible, because the nominal difference obtained is the result of implementing the project.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

1. The Palopo City Arts Building Rehabilitation Development Project costs IDR 24,082,613.29 and the contract value is IDR 6,954,000,000 or 0.034% of the contract value, for the purposes of establishing SMK3.

2. Protection of workers, contractor attitudes that comply with statutory regulations, an efficient work management system, long-term cost reduction, and increased customer satisfaction and reputation are the benefits of implementing SMK3 on the Palopo City Arts Building Rehabilitation Construction project.

3. In the event that the PPE and APK factors protect workers from work accidents, real benefits will be obtained in the form of avoiding medical costs due to work accidents as well as project delay fines, based on an analysis of the real costs and benefits of Work Safety. Management System in projects from eight respondents. Benefit Cost Ratio (B/C) analysis with conditions ≥ 1 results from PPE and APK factors of 83.647. The difference between costs and benefits is IDR 314,059,200. Additionally, because these elements keep employees safe, the intangible benefits become greater and more significant. Additionally, improving worker safety will improve the contractor's reputation and image, thereby fostering confidence in their ability to oversee the next project.

Recommendation

The contractor should provide a routine checking and monitoring schedule for the PPE and APK elements used so that the main components in the SMK3 can be maintained and provided adequately.

The contractor should provide safety induction for new workers who are starting to join in order to achieve success in SMK3

The contractor should provide an SMK3 review schedule to produce adequate implementation and run according to its function.

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