

# Implementation of Occupational Safety & Health Management System (SMK3) and Availability of Safety Facilities, in Construction Projects

A Case Study in Semarang, Central Java, Indonesia

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**Abstract**—The developments in Indonesia, particularly in Semarang, have allowed many contractors to compete in establishing a project. However, nowadays, several contractors not yet obey the Occupational Health and Safety (K3) at construction project. The aim of this study is to know the level of implementation of the occupational health and safety management system in construction projects. This research is descriptive, quantitative approach, through observation. This study used purposive sampling technique. The instrument used in this study was the instrument from the Regulation of the Minister of Public Works No. 9 year 2008. The result of the study shows that the level of the SMK3 implementation in high risk construction projects is 83.43%, while the level of SMK3 implementation in medium risk construction projects is 42.12%. In addition, the provision of K3 facilities at high risk projects is 75% while the provision of K3 facilities at medium risk projects is 30%.

**Keywords**—Occupational Safety and Health, Occupational Safety and Management System, Construction Project

## I. INTRODUCTION

As one of the developing countries, there are numbers of development being established in Indonesia. Some significant developments happen in the construction field. Several construction projects are established in big cities, one of them is Semarang.

Based on the International Labor Organization (ILO) report, there are about 6000 cases of occupational accident that lead to fatal injuries everyday. In Indonesia, every 20 of 100.000 workers suffer from fatal injuries caused by occupational accidents in the construction field. In addition, according to ILO, the loss resulted from occupational accidents in developing countries is kind of high. It reaches 4% of GNP (gross national product) [1].

In order to decrease the occupational accidents, it is important for the companies to implement a proper and strict occupational safety system. Therefore, the Occupational Safety and Health Management System (SMK3) is required in construction projects to increase workers' protection.

The Occupational Safety and Health Management System (SMK3) manages the K3 by implementing management system to achieve effective result in

preventing accidents and other adverse effects. In its practice, a lot of errors occur and bring disadvantages for the company, in-person, and other related people. The SMK3 cannot be underestimated in work on construction projects because the occupational safety is closely related to the life of the project workers or people who are in the project area. In fact, some companies in the construction sector hardly implement a proper occupational safety. This could potentially lead to accidents, particularly to the on-site workers.

The other focus of the occupational safety and health management system implementation is the provision of facilities related to the construction project. By providing good facilities, the implementation of SMK3 would run properly, and vice versa.

Based on the explanation, implementation of the occupational safety and health is required to minimize the occurrence of occupational accidents in construction projects. Therefore, a study of implementation of the occupational safety & health and also the safety facilities in construction project is needed to prevent and decrease the number of occupational accidents happen in the future.

## II. OCCUPATIONAL SAFETY

### A. Occupational Accident and Occupational Safety

Construction works are associated with the equipments use, both the simple and complex ones, from the light to the heavy equipments. Since the time of the industrial revolution until now, the use of mechanical equipments are often chosen.

Occupational accidents may occur in every occupational activity. It happens for several reasons. In this study, accidents refer to the unpredicted, unexpected and inadvertent adverse events. Occupational accidents are the accidents happen in the workplace, suffered by the workers and/or the equipments in an occupational relation.

The cause of occupational accidents is divided into two categories, there: Unsafe human acts and unsafe conditions [2].

Despite the human carefulness, several accidents may occur for unsafe conditions and vice versa. Therefore, a guideline about how to work properly and meeting the safety principles is necessarily needed.

Occupational safety is all effort which guarantees the workers' condition, integrity and perfection (physically and spiritually), along with their works and equipments in the workplace. Those efforts should be carried out by all elements in respect with the working process; they are the workers, working team monitors, companies, government, and society. The objectives of the occupational safety would be maximally achieved if all of the elements harmoniously cooperate.

The objectives of the occupational safety are: (1) Preventing accidents in the workplace; (2) Preventing the emergence of occupational disease; (3) Preventing/minimizing death in the occupation; (4) Preventing/minimizing permanent disability; (5) Securing any material, constructions, use, building maintenance, working equipments, machinery, instruments, and installations; (6) Improving the productivity without torturing the workers out and ensuring their sustainable productivity; (7) Preventing the dissipation of workers, modal, equipments and other resources in the working process; (8) Ensuring the workplaces healthy, clean, comfortable and safe in order to trigger working spirit and excitement; (9) Facilitating, improving and securing the productivity, industry and developments [3].

#### B. Occupational Safety and Health Management System

In the section 3 of the Regulation of the Minister of Public Works No. 9 year 2008 [4], Chapter 4 states about the conditions in implementing the occupational safety and health management system (SMK3) in the constructions field as follows:

1. The activities of construction services conducted by the service user/provider consist of chartering service, consulting service and self-managed activity that involve the workers and working equipments to implement physical works in the field are obliged to implement the SMK3 of the public works construction.
2. The SMK3 of the Public Works Construction implementation shall use these guidelines and its attachments.
3. The SMK3 of the Public Works Construction implementation is categorized into 3 (three) groups, they are:
  - High Risk Project covers all construction works that endanger public safety, property, human life, environment, and become a disruption of construction activities in its establishment.
  - Medium Risk Project covers all construction works that may endanger public safety, property, human life, environment, and become a disruption of construction activities in its establishment.
  - Low Risk Project covers all construction works that may not endanger public safety, property; neither becomes a disruption of construction activities in its establishment.

4. The SMK3 of the Public Works Construction implementation performance is categorized into 3 (three) groups, they are:

- Good, when its assessment reaches >85%;
  - Medium, when its assessment reaches 60% - 85%;
  - Poor, when its assessment reaches <60%.
5. In the SMK3 of the Public Works Construction implementation, the Contract of Occupational Safety and Health Plans (RK3K) must be conducted by the service provider and approved by the service user.
  6. In the workplace must employ a worker who trained and responsible for first aid (P3K)
  7. In self-managed activity, it is required to designed:
    - Who as a direct organizer
    - Who as as a controller

#### C. Indicator of Implementation of SMK3

The indicators of Occupational Safety and Health Management System (SMK3) According to Regulation of the Minister of Public Works No. 9 year 2008 described at Table 1.

#### D. The Availability of K3 Facilities

To ensure a good implementation of the Occupational Safety and Health, some standard facilities have to be taken into account in order to support the safe activity. The standard Self Protective Equipment (APD) includes project helmet, protective footwear, protective goggles, masks and ea3.72r protectors. In addition to the protective clothing, the installation of warning signs, traffic signs, the proper equipment use in line with its function and other conditions making the workplace safe, the support from experienced workers would ensure that the occupational safety and health runs smoothly. Besides the planning, training and monitoring, the supporting facilities of the Occupational Safety and Health are also important. The facilities involve both the surrounding facilities and ones that attached to the workers.

### III. METHOD

This study is descriptive, used quantitative approach. The method of collecting data through on-site observation. This study observed the implementation of the Occupational Safety and Health Management System (SMK3) and the provision of the facilities in particular projects.

This study was conducted September 2014 – December 2014, in Semarang, which is one of the developing cities in Indonesia. This study observed 5 projects in Semarang as the objects of the study. There were 3 high risk projects and 2 medium risk projects.

The data was collected by observation. The purposive sampling technique was used in this study. The purposive sampling technique is a way of taking samples by choosing the subjects or objects based on specific criteria set forth by the researcher [5].

TABLE I. THE INDICATORS OF OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT SYSTEM (SMK3)

No	
1	K3 POLICY
1.a	Have a K3 policy and signed by top manager
b	The policy appropriate to the nature and risk category of K3
c	The policy includes a commitment to the prevent-ion of accidents and cover compliant and law
d	The policy used to assess the target K3, docu-mented, implemented and maintained
e	The policy communicated to all personnel in order to care for K3 policy
f	The policy can be accessed by all part-ies and can be evaluated periodically
2	K3 PLANNING
2.a	Hazard identification, risk assessment and control
b	Compliance to the regulations and other requirements
c	Objectives and programs
3	IMPLEMENTATION OPERATION THE PLAN
3.a	Resources, organizational structure and accountability
b	Competence, training and awareness
c	Communication, participation and consultation
d	Documentation
e	Document control
f	Operational control
g	Response and emergency preparedness
4	EXAMINATION
4.a	Measurement and monitoring
b	Evaluation of compliance
c	Incident investigation, nonconformity, corrective and preventive actions
d	Recording control
e	Internal audit
5	MANAGEMENT REVIEW
5.a	The review implemented in the planned time
5.b	Using analysis of opportunities for improvement and policy
c	The review evaluates the results of the internal audit, compliance evaluations, the results of participation and consultation, communication of relevant external parties including criticisms and suggestions
d	The review includes the performance of SMK3, the expansion target, incident, investigation, corrective and preventive actions, and follow up to the next management review.
e	The review includes recommendations for improvement, and the results are in accordance with the company's commitment to continuous improvement
f	Results of the review is the line of improvements in the performance of SMK3, improvements in policies and objectives SMK3, improvements in resources, and improvement in other elements
g	Management review results have been communicated to stakeholders

The instrument used to find the implementation of SMK3 was the Regulation of the Minister of Public Works No. 9 year 2008. This instrument contains the conditions required in implementing the SMK3, which described at Table 1. Whereas the instrument used to find the provision of safety facilities was observation-form with Likert scale, on a scale of 1 to 5. Each item was assessed by observing the provision of the K3 facilities in the projects. The item was marked “unfeasible” if the relevant item was damaged, and the item was marked “unavailable” if the number of relevant item was insufficient compared to the number of workers in the projects. Data analysis used descriptive.

#### IV. FINDING AND DISCUSSION

##### A. The Implementation of the SMK3

On one hand, the result shows a number of 83.43% for SMK3 implementation in high risk projects, because the workers have the awareness and compliance to the K3. Furthermore, the project manager takes affirmative steps to the workers who fail to comply with the K3 regulation at the workplace. On the other hand, the result for medium risk projects shows a number of 42.12% since the workers do not have any awareness or compliance to the K3. The project manager does not take any affirmative steps in managing the K3. This inconsiderate of mind decreases the level of the SMK3 implementation.

TABLE II. THE IMPLEMENTATION OF OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT SYSTEM (SMK3)

No*)	Implementation of SMK3 in Construction		
	High Risk Project	Medium RiskProject	Max.score
1.	6.50%	3.32%	7.00%
2.a	8.33%	4.37%	10.00%
b	4.32%	2.30%	5.00%
c	5.24%	3.25%	6.00%
3.a	4.64%	3.00%	5.00%
b	3.72%	2.50%	5.00%
c	3.58%	2.34%	5.00%
d	3.36%	1.89%	5.00%
e	3.98%	1.96%	5.00%
f	5.25%	1.17%	7.00%
g	5.50%	3.50%	7.00%
4.a	4.70%	2.62%	6.00%
b	3.75%	1.87%	5.00%
c	5.54%	2.25%	6.00%
d	4.50%	0.00%	5.00%
e	3.81%	1.79%	5.00%
5	5.14%	2.47%	6.00%
TOTAL	83.43%	42.12%	100.00%

\*) accordance with Table 1

##### B. The Availability of K3 Facilities

This study finds that the availability of the K3 facilities in high risk projects reaches 75%. This number is achieved because there is lack of the K3 signs at the workplace. Some construction projects do not provides the standard APD for the visitors and workers at the projects. However, the provision of K3 facilities in medium risk projects reaches 30%. The same conditions as in the previous projects, there is lack of the K3 signs at the workplace. These construction projects do not provides any APD for the visitors and workers at the projects. Therefore, it achieves low score.

##### C. Discussion

Based on this study, it could be concluded that some contractors do not comply with a good implementation of the SMK3, particularly in the medium risk projects. Some of the reasons why it could not meet the standard are the lack of the K3 budget and the contractors' low awareness regarding the occupational safety and health. Differ from the previous statements, the implementation of the SMK3

in high risk project is categorized as good. Some its K3 facilities may less standard but it would not endanger the sustainability of the projects. The result of this study closely aligns the previous study conducted by Dwi Friska G. Naibaho [6] that the level of the contractors' compliance in implementing the SMK3 is badly cross sectioned. This condition is led by the contractors' low awareness.

#### V. CONCLUSION

Based on the data in this study regarding the level of implementation of the Occupational Safety and Health Management System (SMK3) in construction projects in Semarang, some conclusions could be drawn.

1. The average value of the level of the SMK3 implementation in high risk projects is 83.43%. This value is categorized as MEDIUM in terms of the SMK3 implementation in the projects.
2. The average value of the level of the SMK3 implementation in medium risk projects is 42.12%. This value is categorized as LOW in terms of the SMK3 implementation in the projects.
3. The availability of K3 facilities in high risk projects is 75%. This value is categorized as MEDIUM in terms of the provision of K3 facilities in the projects.
4. The availability of K3 facilities in medium risk projects is 30%. This value is categorized as LOW in terms of the provision of K3 facilities in the projects.

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