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Research paper

THE strategic of implementation health and safety to improved performance construction management system (Case in Arcamanic project, Indonesia)

Achmad H Sutawijaya[1*], Lenny C Nawangsari[2]

[1]Postgraduate, University Mercu Buana, Jakarta and Indonesia
[2]Magister Management, University Mercu Buana, Indonesia
**Corresponding author E-mail: ahsuta69@gmail.com*

Abstract

Implementation of management systems on health, safety and environment (HSE) in Indonesia is still not optimally implemented, this is because the safety culture is not rooted among the people. Accidents occurred in construction activities will have direct impact on safety construction time, productivity losses and every individual involved in the work. These concerns are responsibility of company that must be addressed by the delivery of an integrated management strategy of quality, health and safety and environment. This study aims to obtain strategic implementation model in occupational safety and health to improve performance, particularly on construction activity. Qualitative and philosophical approaches are methods that used in this research. This research is located at construction area of SPOrT Jabar Arcamanik Indonesia with 10 (ten) research subjects involved. This research indicated that in order to improve performance in construction management, the system must be integrated with safety management strategy which are categorized in three sub area: structure policy organization, procedures and implementation. The implementation of this integration is expected to establish a culture of safety in the context of behavior and environment. In conclusion, the implementation of this project will improve performance in construction activities.

Keywords: *strategic implementation of health and safety; safety culture and performance of construction*

1. Introduction

Nowadays, one of the most pressing concerns for this construction industry is the occupational safety & health which is an increase in the accidents and health problem (1). The construction industry is part or overall series of activities which support construction activities starting from a provision of goods needed for construction activity, delivery of goods, until implementation of construction activity which includes some activities such as civil, architectural, mechanical, electrical and urban planning. Construction activity itself is series of activity on planning, implementation, and supervision which covers architectural works, civil, mechanical, electrical and urban planning along with its completeness to actualize a building or any other physical form.
Below are some elements involved in the implementation of the construction project:

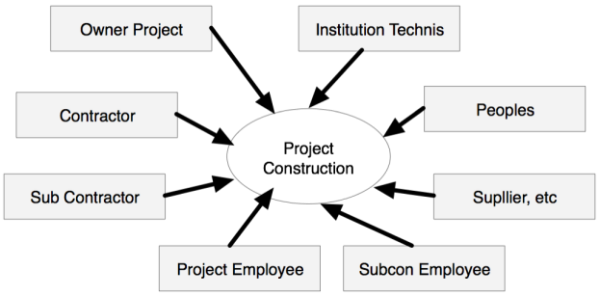


Fig 1: Construction Project Implementation

Construction activity is an important element in a development of construction, but this element has relatively higher accident rate compared to other activities. Construction activity may cause some undesirable impacts, especially on work safety and environment.
Therefore, a good implementation of Health, Safety, and Environment (HSE) in a construction project is necessary for construction activities to minimize the risk that arose from construction activities. There are many factors that caused work accidents in a construction project. According to data, those factors are poor implementation of HSE in management, a budget issue on HSE implementation, an ineffective organization of HSE, no reward on HSE implementation, and minimum workers' knowledge on HSE. Based on a report generated by PT Jamsostek from the year 2000 to 2015, work accident fluctuated every year. For example, for the

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year of 2000 to 2007, the number fluctuated around 98,000 to 105,000 cases every year until it showed a significant decrease on 2008 where work accident fell to 36,986 cases (Anshori 2008). Below are statistical data for work accident for a period of 2007 – 2011 in Indonesia according to ILO:

Table 1: Workplace Accident Statistics in Indonesia, 2007 – 2011

Periods	Number of Accident (Cases)	Work accident insurance claims
2011	99.491	505 billion
2010	98.711	401.2 billion
2009	96.314	328.5 billion
2008	94.736	297.9 billion
2007	83.714	219.7 billion

Work accident number as stated above is still relatively high. Work accident could cause a detrimental effect for both workers and contractor. For workers, work accident could cause injury (light or heavy), disability or even death. While for a contractor, work accident could cause financial loss. Knowledge related work accident in a construction project can be used as input for steps of work accident prevention and show that work accident will create a loss for workers and contractor.

Related to the implementation of health, safety, and environment (HSE), implementation of this system in the field still has any flaws and weakness although regulation on this issue has been issued. The phenomenon that is related to HSE implementation in construction project industry are:

1. Lack of knowledge about HSE in project workers community
2. Lack of attention in current HSE implementation
3. Unsafe work culture
4. Lack of control on HSE implementation

2. About Arcamanik Project

Sarana Pembinaan Olahraga Terpadu (SPOrT) Arcamanik is one of a sports facility that will be utilized for PON XIX/2016 Jabar. Starting from the year of 2016, facilities that are built were athletic track, beach volley area, baseball field, gymnasium, and Youth Center building.

3. Literature Review

3.1. OHSAS 18001

OHSAS - Occupational Health and Safety Assessment Series-18001 is an international standard for the implementation of SMK3. As a standard, OHSAS 18001: 2007 does not contain implementation procedures. Therefore, OHSAS 18001: 2007 is equipped with OHSAS 18002: 2008 as a procedure for the implementation of OHSAS 18001: 2007. The OHSAS 18001 standard is also a set of standards aligned to be applied with other standards (ISO 9001, ISO 14001, etc.) making it easy to integrate (Incorporating) the application of the OHSAS 18001 Standard to other standards (in particular the ISO Standards).

The objective of OHSAS is to improve occupational health condition and prevent the occurrence of work accident potential and prevent the occurrence of work accident potential because Safety and Health (K3) condition not only cause economic loss but also non-economic loss such as bad image of company. The main components of OHSAS 18001 standard in its application in the company include: the company's commitment to OHS., there are plans for OSH programs., OSH Operation and Implementation., Inspection and corrective action on the implementation of OSH in the company., Assessment of company management on OSH policy for sustainable implementation.

In the planning stages, the OHSAS 18001 standard has requirements for the organization to establish a control hierarchy. During the hazard identification process, organizations need to identify whether there is already control within the organization and whether such controls are adequate for hazard identification. When defining controls or making changes to existing ones, organizations need to take into account hierarchy of hazard control/control. The hazard control hierarchy basically means the priority in the selection and implementation of controls related to the hazard Safety and Health (K3).

3.2. Safety culture

A safety culture is a combination of many safety-related variables, which can be collected into the levels of safety climate and safety activity (2). Others say that, Work culture is a set of behavior patterns that are attached as a whole to each individual in an organization. Building culture also means enhancing and sustaining the positive sides, as well as attempting to habituating processes of certain behaviors in order to create a new, better form.

The fundamental goal of a work culture is to build fully human resources so that everyone is aware that they are in a relationship to the nature of the customer's role, the supplier in communicating with others effectively and efficiently and excitingly. The working culture seeks to transform traditional communications into modern management behaviors, so that embedded trust and high spirit of cooperation and discipline.

The purpose of Safety and Health (K3) culture, is to be awareness workers refers to requirement of Safety and Health (K3). Therefore, every worker must have the awareness to follow the rules or instructions given for their safety. Culture Occupational Safety and Health Work (K-3) in a company as part of corporate organizational culture can be seen from three aspects, namely:

1. Psychological aspects of workers to Safety and Health (K3) (Psychological aspects, what people feel, what is believe). The aspect, what one feels is highly related to the Personal aspect (PERSON), such as way of thinking, value, knowledge, motivation, hope, and so on.
2. Occupational aspects of occupational safety (Behavioral aspects, what people do, what is done). The aspect is closely related to daily behavior (BEHAVIOUR), such as daily behavior in the company, habits in K3 and so on.
3. Situation aspects or organization in relation to Safety and Health (K3) (Situational aspects, what organizational has, what is said). The aspect is closely related to the situation of the work environment like what the company/organization about Safety and Health (K3), for example OSH Management System, SOP, OSH Committee, equipment, work environment, and so on.

   These three aspects interact and interact with each other. A strong Safety and Health (K3) culture will certainly be marked by the strength of these three aspects.

3.3. Sustainability Construction

Project definition is a set of interconnected activities where there are starting points and endpoints and specific outcomes, projects are usually cross-organizational, requiring various skills from different professions and organizations. The construction project is a series of interrelated activities to achieve certain goals (buildings/ construction) within a certain time, cost, and quality. Construction projects always require resources (man), materials, machines, methods, money, information, and time.

Currently, construction projects are growing in implementation, where the building is the easiest object for the implementation of sustainable construction due to younger control in every stage of the activity. In this case, the Project Manager in a construction project is positioned to act proactively, care about the environment during the construction phase through the efficient use of natural resources (energy conservation, water, air, marine) and minimize construction waste.

Sustainable construction is a concept offered by actors in the construction industry to address the challenges of sustainable development needs in the infrastructure and construction sectors. Sus-

tainable development itself is a development concept aimed at providing a better quality of life for everyone today and for future generations. Sustainable development includes three aspects of development, namely social, economic and environmental.
The construction industry has a role in the success of sustainable development by building a better quality of life and more competitive and profitable, providing satisfaction, convenience, and value for owners and users, protecting the environment, and minimizing the use of resources and energy. Thus, sustainable construction will be able to create and operate environmentally friendly buildings with the efficient use of natural resources and use ecologically sound design. In this case, the construction industry must be seen as a system consisting of various interrelated processes ranging from the process of programming, planning, design, construction, implementation and utilization, maintenance, and deconstruction with many related parties (supply chains) Users and service providers.

4. Methodology

The method used in this research is a qualitative method. Qualitative research can be interpreted as investigation process where researcher gradually interprets one social phenomenon by differing, comparing, duplicating, and classifying the research object (3). Furthermore, Creswell (4) stated the objective of the qualitative research is to understand the specific situation, event, group or social interaction. Therefore, the researcher decided to use qualitative research method because it could answer the problem in this research better so the data that will be obtained is more valid and describe the real situation.
The researcher used post positivist approach in this research. The researcher would like to discover more about strategy implementation of Health, Safety, and Environment (HSE) in construction project by comparing the existing theory with the actual event that happened on the field. The researcher conducted data analysis in this research with (5), Fundamental principles of occupational health and safety as fundamental of the research.
The researcher conducted research on one of SPOrT construction projects in Bandung, West Java Indonesia with Project manager, Project construction management leader, HSE contractor and HSE construction management as the sources of information. Data obtained in this research through an interview with the sources supported with some HSE project implementation. Researcher directly observed the construction project, continued with the unstructured interview with the sources so a researcher can dig more information related to system, method, program and HSE project implementation. The researcher also checked some documents which supported the research such as blueprint, report and audit result that owned by the contractor.
In this research, the researcher used only two out of three type of triangulation which is data collection technique and timing triangulation. The researcher conducted an interview, observation, and documentation on one source to get more accurate information about existing HSE strategy in the project. The researcher also met the sources in the different time frame to obtain consistent information from the sources.
At the phase of data presentation, researcher classified the data obtained according to its category or needs of the data itself. This was done to ease researcher understand HSE strategy which is available in a construction project. Researcher pulled the conclusion from data obtained on the field after classifying those data so the researcher could describe a strategic implementation of HSE in a construction project with (5) in fundamental principles of occupational health and safety as a theoretical fundamental of this research.

5. Results and Findings

5.1. Result

This research finds that strategic implementation of HSE in construction project basically is as follows:

a) HSE structure and policy creation which based on OHSAS 18001, law and regulation that are related to HSE
b) HSE planning and procedure creation which consists of: risk identification, risk assesment, priority scale, HSE risk control, and creation of system, procdure and work program
c) On its implementation in project, there is operation control for HSE program
d) HSE performance evaluation and activity checking referring to the implemented activity rather than planned activity
e) Safety culture creation in construction project
There are 3 elements in creating safe work culture which are related one to each other, those are person, behavior and environment.

With this system being implemented in the project, HSE sustainability in construction project will be achieved.

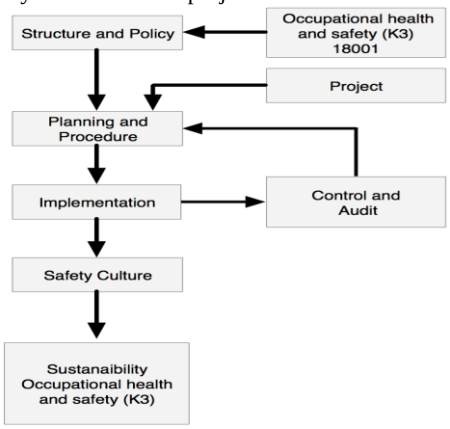


Fig 2: Strategy Implementation Occupational Health and Safety

5.2. Finding/Discussion

5.2.1. Structure and Policy

Related to HSE structure and policy, at the first place, company must establish

1. HSE public policy in the company with OHSAS 18001 as fundamental.

HSE policy that established must cover:

a. Commitment to prevent work accident and diseases caused by work
b. HSE sustainability
c. Commitment to obey law and other policies related to HSE

2. HSE organization structure for HSE implementation and description of task on each organization line
3. HSE related regulation

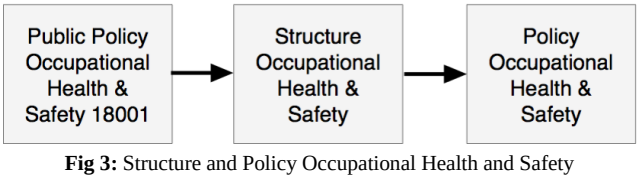


Fig 3: Structure and Policy Occupational Health and Safety

5.2.2. Planning and Procedure

1. Risk identification and assessment

- Identify and assess potential severity level/loss/impact caused by construction project
- Assess risk level of HSE construction related to severity level

2. Priotity Scale

Application of priority scale is applied based on task which has low, medium and high HSE risk with explanation as follows: Priority 1(high risk), priority 2 (medium risk), and priority 3

(low risk). If the risk level is assessed at high risk, then the task will be assigned as priority 1 task.

3. HSE risk control. Form of risk control are classified using risk control hierarchy below:

- Elimination: redesigning workflow or replacing material that could possibly cause an accident to make minimize or eliminate the risk
- Subtitute: subtituting the work method with safer process or the material with lower risk
- Engineering: modifying the technology to avoid accident
- Administration: controlling through procedure implementation of working safely.
- Using personal safety equipment: all kind of safety equipment used by workers must fulfill minimum standard and must be worn by workers depends on their tasks.

4. System creation, procedure and HSE work program

- HSE procedure is made based on the task coverage
- HSE program includes: resources, time frame, achievement indicator, monitoring and responsible parties
- HSE programs made with details related to emergency management in workplace, training that suitable with risk control and first aid on accident.

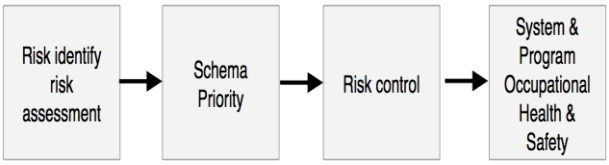


Fig 4: Planning and Procedure Occupational Health and Safety

In connection with the Examination and Evaluation of Occupational Safety and Health Activities:

- Activity inspection and evaluation of OHS (K3) performance is done referring to the activities undertaken compared to the planning.
- The results of examination and evaluation of OHS (K3) performance are classified according to the appropriate category and not according to the benchmarks as set out in the Target and the OH & S (K3) Program.

5.2.3. Implementation

On HSE implementation:

1. HSE program implementation
   Operational control is conducted on HSE program implementation
2. Evaluation and Audit

- HSE Checking activity and performance evaluation implemented based on the activity that will be conducted rather than activity that has already planned
- Results on HSE checking and performance evaluation is classified by the suitability level on benchmark as determined by aim of HSE program
- If there is a thing that not in accordance, including if an accident occurred in workplace, there will be review on the program to fix the issue.

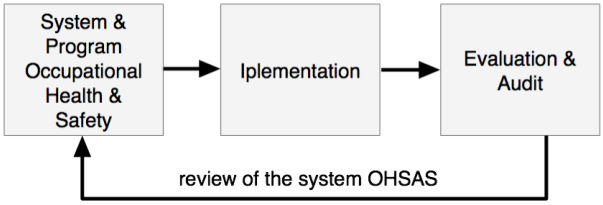


Fig 5: Implementation Occupational Health and Safety

OHS Governance Strategy at *SPOrT Jabar Arcamanik* remodeling Project is:

1. Occupational Safety and Health K3 Policy which refers to the Regulations both in RI and International Regulations.
2. OHS Planning and Procedures
3. K3 Implementation
4. Evaluation and Audit

5.2.4. Safety Culture

Safety culture can be reflected through human behavior, perception and attitude. Perception and attitude, behavior and sysem management are elements that are combined to form safety culture in the work place. Safety culture is a collectivist behavior in an organization where by time goes, it become pattern and custom for those who are in the organization. Safety culture is set of assumption and related practices to reassure people that safety assurance that will be developed. Safety culture is an environment where people do their job safely and create behavior pattern which learned together and sustainable (6-8).

By this, it can be assumed that safety culture can be formed at any degree of behavioral degree. When a person decide to act safely, they act and think that the environment is safe and they try to suit their behavior into it.

- First aspect, what is perceived by a person is relatable with the personal aspect such as way of thinking, values, knowledge, motivation, hope and others
- Second aspect related to daily behavior such as daily behavior in workplace, behavior in HSE and etc.
- Third aspect related highly with work environment such as what the organization own about HSE for example, System management HSE, SOP, HSE commitee, tools , work environment etc.
- Those three asafetyspects are related, interacted and influeced one to each other

Safety compliance descibed as main activities that need to be implemented by each individual to maintain safety in the workplace, such as following standard operating procedure and wearing personal safety equipment. While safety participant referring to the indirect behavior which contributes to the individual safety but also could develop an environment which promotes safety such as volunteering in safety procedure activities.

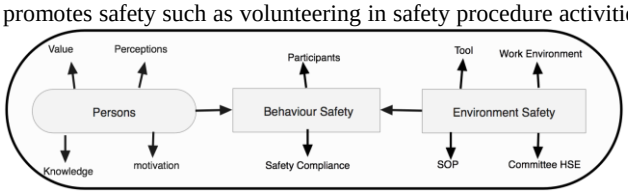


Fig 6: Safety Culture Occupational Health and Safety (HSE)

Consistent behavior towards agreed standard must be presented by good safety behavior and this must be considered in performance evaluation. The formage of good safety culture could control and minimize construction cost and increase ongoing operational efficiency in the long term. Changing safety culture is long term strategy to build sustainable business.

5.2.5. Strategy Sustainability Occupational Health and Safety

There are three major benefits that can be presented within the framework of the Health and Safety Occupational; Economical, Environmental and Societal Benefit. By maximizing the practice of this, the company has big potential to sustain in the industry.

Refers to figure 2 above is a model of safety and health governance that occurs in construction companies which are divided into 4 stages. The first stage is called the planning stage, which in this stage the organization that will implement OHSAS 18001 based OHSAS must understand international standard or international standardized ILO standard. The ILO was formed with the aim of promoting social justice for communities around the world, especially workers.

The second stage is the integration stage. At this stage, in many cases integrating the standard management system is combining elements of various systems and the result of the merger is said to

be an integrated system. Genuine integration does not merely incorporate the common elements into one system but it is how an organization can push the integration process further by involving the reader, the review process, and the system approach so that the system is truly integrated into the system And fully integrated into the organization of business operations. To get the right integrated system, the focus of the management system should be focused on the employees who are the implementers of the system in the organization. Integration of the components of the management system is facilitated when employees working within an organization are directly responsible for quality, environmental and safety issues and occupational health. The integration of management systems at the worker level will reduce the confusion of workers that often occur when dealing with multistandard of various systems.

The third stage is the installation stage. This stage is a systematically arranged procedure to apply safety rules in performing the work so that the work takes place safely, orderly, effectively and efficiently. The purpose of this stage is to avoid errors and omissions of executors, supervisors and responsible / job coordinators and prevent personal accidents. At this stage, starting from planning and procedures. In OHSAS 18001 OHSAS Management System is planning (planning). OHSAS 18001 requires organizations to establish good planning procedures. Without planning, the system results are not optimal. This planning is not continuous and the implementation of OSH policy that has been determined by top management by considering the result of audit ever done and input from various parties including result of K3 performance measurement. The results of this planning then become an input in the implementation and operation of K3. Good OHS planning, beginning with hazard identification, risk assessment and determination of control. In doing so, consideration should be given to the various OSH requirements applicable to the organization as well as to other requirements such as industry standards, codes or guidelines that pertain to or apply to the organization. From the results of the plan, the objective of K3 to be achieved and the work program to achieve the objectives that have been determined

6. Conclusion

OHSAS 18001 and OHSAS (OHSAS) Safety Management and Work Safety Strategy model adapted to the condition of construction projects in Indonesia. HSE system management is an integrated system management to operate and develop HSE regulation that has been ruled out by the company, and also to mitigate risks that are potentially occurred in the company. To increase safety standard in the construction industry, the minimum standard should be applied is the health and safety standard grading (OHSAS) and this could not be bargained. OHSAS provides a good structure for a construction company to achieve company's objectives efficiently and effectively through good guidance, movement and activity control on those who are involved in a teamwork.

Acknowledgements

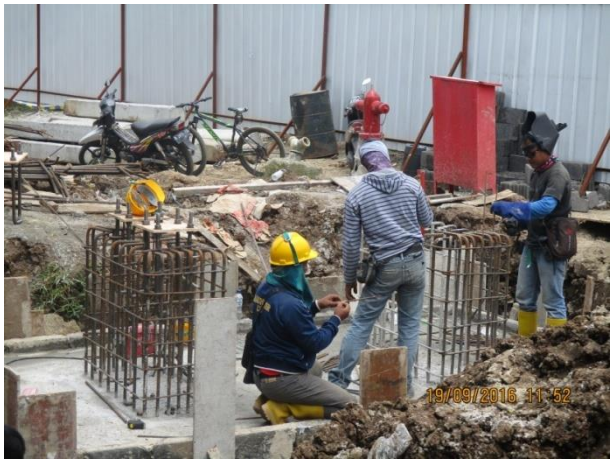
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Documentation Attachment










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