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COST OF COMPLIANCE WITH HEALTH AND SAFETY MANAGEMENT SYSTEM AMONG CONTRACTOR IN CONSTRUCTION INDUSTRY

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Abstract: Accidents and injury statistic in construction industry were among the highest compared to the other sector every year. One of the main reasons that contribute to this problem was due to the insufficient amount allocated for occupational health and safety management. The aim of this study was to identify the contractors approach towards safety and health management system compliance by investigating the cost and benefit of that approach. This study was conducted using questionnaire surveys around the District of Johor Bahru, Johor, Malaysia. The respondents were made of supervisor, engineer and project manager that work with main contractor which the project values worth from RM 1 to 25 million. The data were collected using questionnaire forms and frequency analysis was being used to analyze the data gathered. Overall, this study had identified the different approaches taken by contractor in implementing health and safety management system within organization such as recorded work-related accidents but few for ill-health and most of contractors undertook basic elements but very few of them implemented performance measurement. Cost implication was still is the biggest barrier to implement formal OHSMS. Thus, such implementation was legally driven. This study also manages to highlight what are the nature of expenditure and impact of the implementation to the organization. The cost of compliance varies from minimum 0.15% to 1.08% with average of 0.41% from project value. Most respondents perceived benefits outweighed cost compare to those who thought cost outweighed benefits.

Keywords: *Occupational Health and Safety; Management System; Construction; Cost; Benefits.*

1.0 Introduction

Health and safety management system must be supported by an amount of cost to make it efficient in reducing rate of accidents and deaths among the construction workers (Abdul Rahim et al., 2000). The statistic shown that the death rate occurs in the construction sector is among the highest compared to the other industries (Abdul Rahim et al., 2008). This problem was caused by poor handling in health and safety management of contractor due to insufficient amount allocated to meet such compliance (Shaari, 1995; Mohammed, 2002).

The occupational safety and health (OSH) management system(OSHAS 18001, 1999) in the organization has five main elements which follow the internationally accepted Demming cycle of Plan-Do-Check-Act, which is the basic to the "system" approach to management (Michael, 2004). The elements are namely Policy, Organizing, Planning and implementation, Evaluation and Action for improvement as shown in Figure 1(Abdul Rahim et al., 2004).

Policy contains the elements of OSH policy and worker participation. It is the basis of the OSH management system as it set the direction for the organization to follow. Organizing contains the elements of responsibility and accountability, competence and training, documentation and communication. It makes sure that the management structure is in place, as well as the necessary responsibilities allocated for delivering the OSH policy. Planning and implementation contains the elements of initial review, system planning, development and implementation, OSH objectives and hazard prevention. Through the initial review, it shows where the organization stands concerning OSH, and uses this as the baseline to implement the OSH policy. Evaluation contains the elements of performance monitoring and measurement, investigation of work-related injuries, ill-health, diseases and incident, audit and management review (Syed et al., 2000). It shows how the OSH management system functions and identifies any weaknesses that need improvement. It includes the very important of auditing, which should be undertaken for each stage. Person independent of the activity being audited should conduct the audits (Weinstein, 1997). This does not necessarily mean third party auditors. Action for improvement includes the elements of preventive and corrective action and continual improvement. It implements the necessary preventive and corrective actions identified by the evaluation and audits carried out. It also emphasizes the need for continual improvement of OSH performance through the constant development of policies, systems and techniques to prevent and control work-related injuries, ill-health, diseases and incidents (SIRIM, 2005).

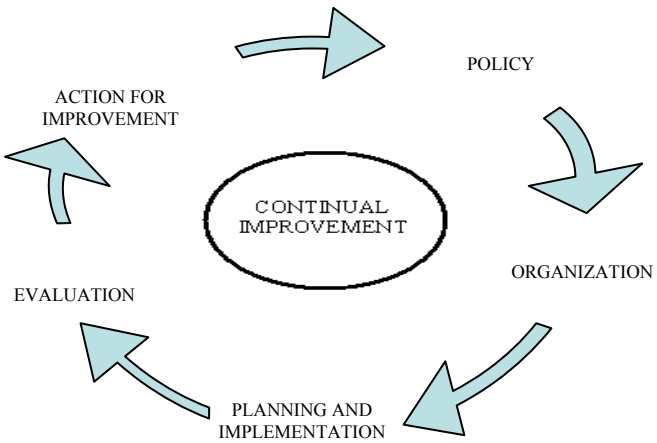

Figure 1: OSH Management System

Meanwhile, the safety laws and regulations such as Occupational Safety and Health Act (OSHA) 1994, Factory and Machinery Act (FMA) 1967 and Building Operation and Work of Engineering Construction (BOWEC) 1986 were reviewed in order to list the aspect that need to be included in the cost evaluation. There are eight items being considered.

1. Worker's Insurances
2. Safety inspection

3. Safety meeting
4. Safety training
5. Payment to safety officer /consultant
6. Safety tool
7. Personal protective equipment
8. Supporting equipment for administration, management and documentation.

2.0 Objective of Study

The aim of this study was to investigate cost of compliance with health and safety management among contractors. Two objectives had been set up as below:

1. To identify the approach taking by contractor in implementing aspects of health and safety management system within their organization
2. To investigate cost and benefits of the compliance to the OSH Management System.

This study was conducted in District of Johor Bahru and Skudai, Johor. The respondents consist of supervisor, engineer and project manager working within contractor organization which the project value ranging from RM 1 million and above in the building construction sector only.

3.0 Methodology of Study

This study employed questionnaire survey that follow these steps:

1. Initial planning
2. Questionnaire preparation
3. Choosing respondents
4. Distributing and collecting questionnaire form
5. Analyze the data
6. Conclusion

When the objectives and scope of the study was determined from the literature review, a set of questionnaire was developed based on what has been discussed before. This questionnaire contains four sections A, B, C and D. Section A captured the background of the respondent. Section B was about approach towards health and safety management. Section C was about nature of expenditure and the benefit of the compliance whilst section D gathered the rate provided by contractor in compliance with health and safety management system.

The questionnaire forms were distributed by hand (20 set) and by post (30 set). The return only 15 sets by hand and 5 sets by post make the total of 20 set that available to be analyzed. Analysis of the data was done using frequency analysis in the form of percentage. The cost of compliance was stated by percent from total project value.

$$\text{Frequency (percent)} = \frac{\text{No. of respondent}}{\text{Total respondents}} \times 100\%$$

4.0 Results and Discussion

Brief results presented below were based on the analysis of the questions for each section that correspond to the objectives of study.

4.1 Section A: Respondents background

Figure 3 shows make up of respondents, Figure 3 shows 80% of company had been operated more than 5 years, while 20% was less than 5 years old.

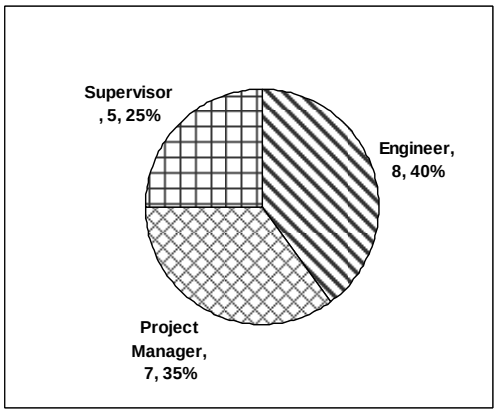

Figure 2: Types of Respondents

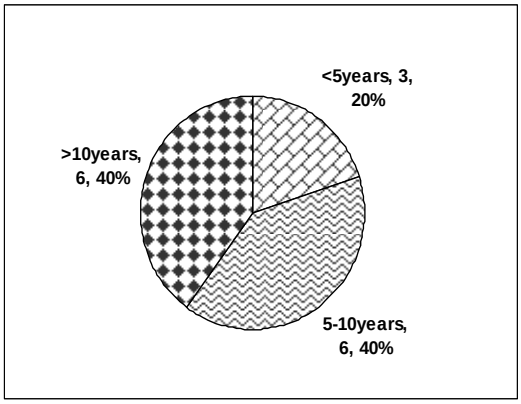

Figure 3: Years Operated

4.2 Section B: Approach toward Health and Safety Management System

Figure 4 shows 85% respondent had formal health and safety management system while 15% said conversely. Figure 5 shows that 85% respondents recorded work related accidents, only 30% recorded ill-health and 15% said neither.

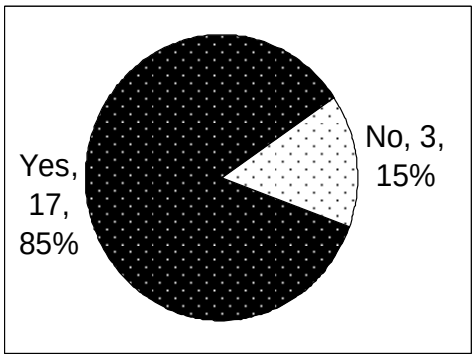

Figure 4: Formal Health and Safety Management System in place.

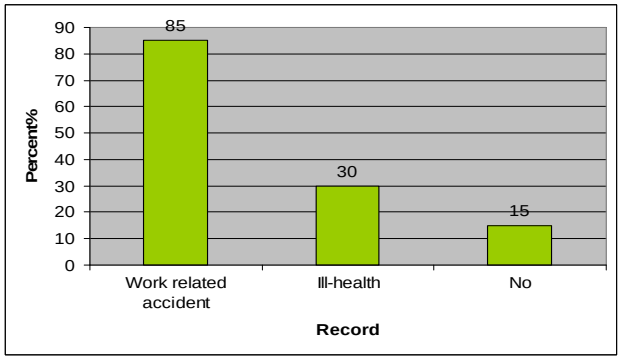

Figure 5: Work Related Accident and/or ill-health record

Figure 6 shows what were included in the contractor health and safety system. Many of them have safety officer (70%), accident reporting system (85%), documented risk

assessment (75%), and written policy (85%). But few of them have performance measurement (30%), and performance target (55%).

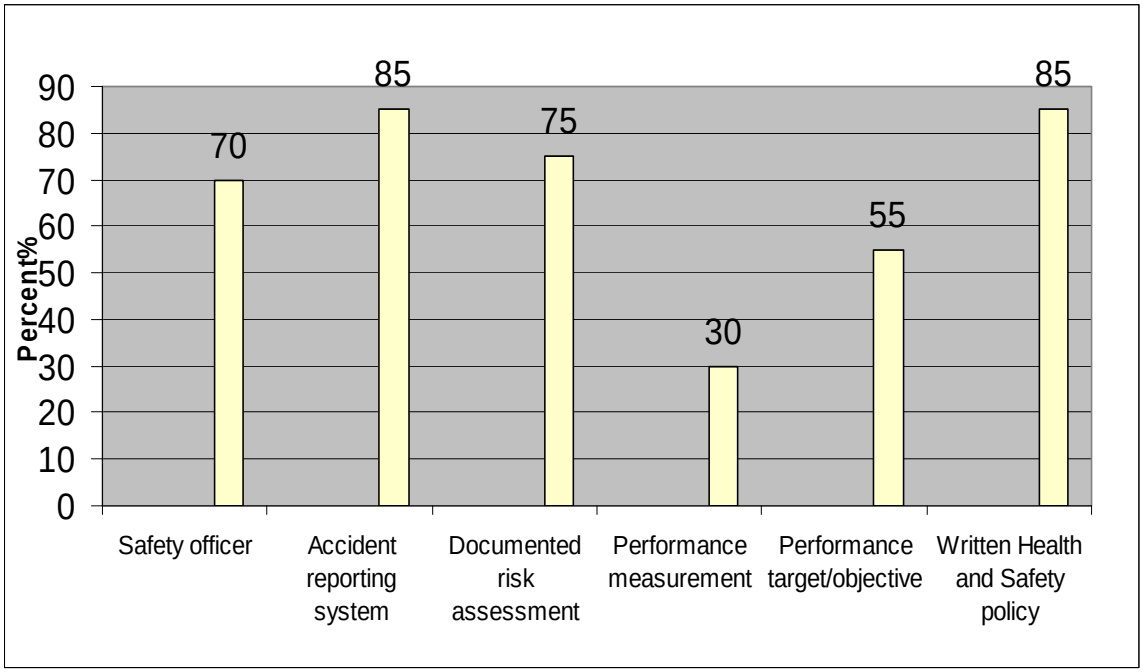

Figure 6: What were included in OSHMS

Figure 7 shows what were the barrier faced to implement OSH system. The result indicated cost implication (90%), not priority (10%), lack of knowledge or information (45%) and time restriction (40%).

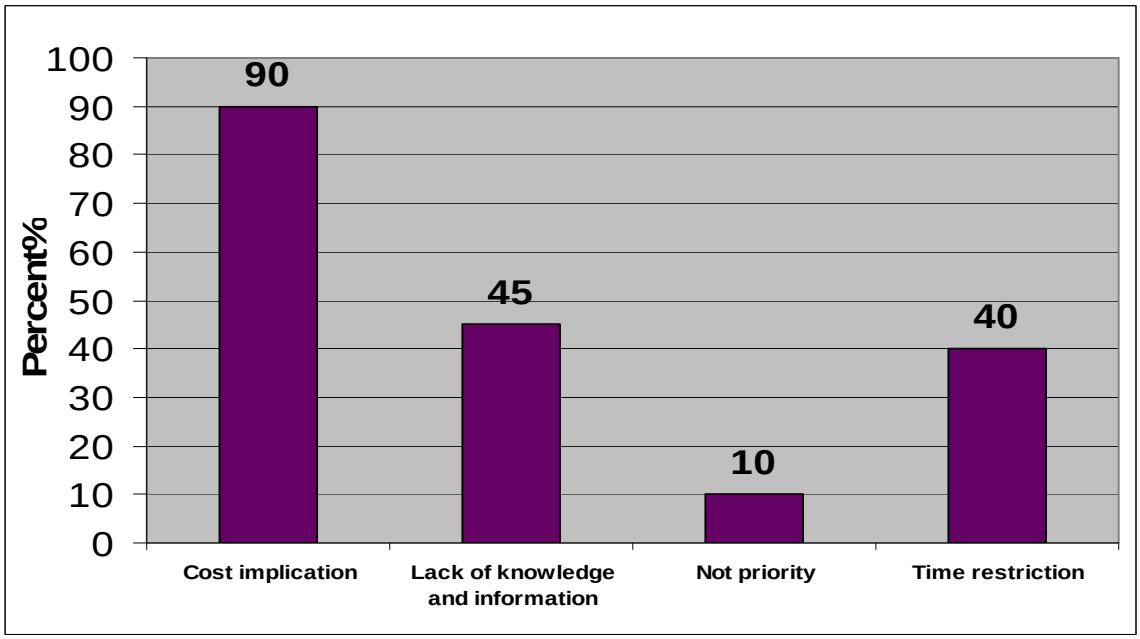

Figure 7: Barriers in Implementing OHSMS

Figure 8 shows factors that motivate the contractor to have OHSMS. Legal obligation (75%), had been visited by DOSH Inspector (70%), Insurance cost and health and safety publicity (65%), Organization reached particular size (15%), and supplier/customer/client pressure (5%).

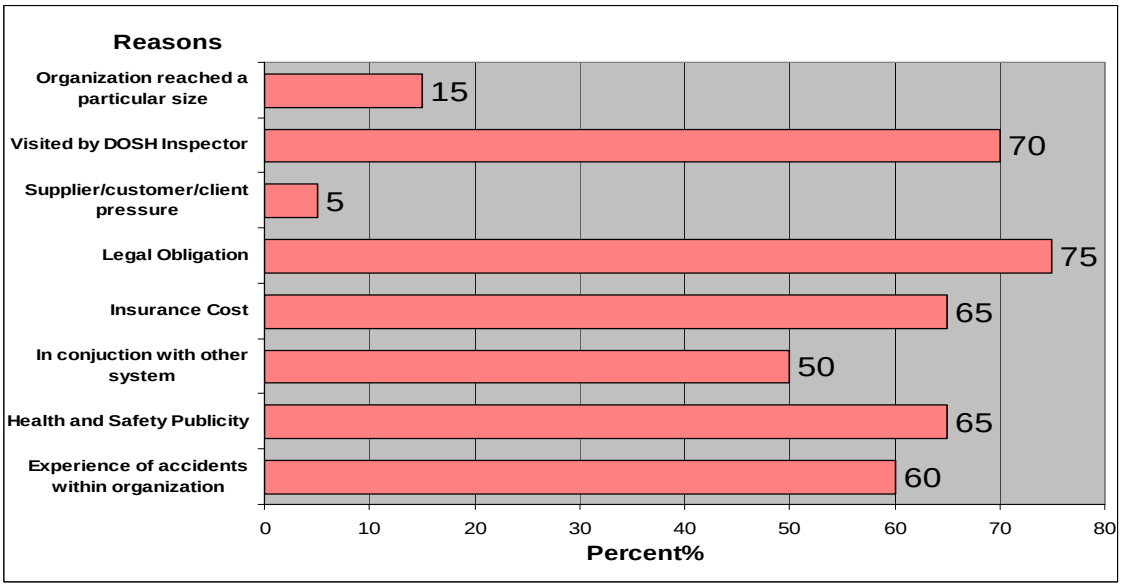

Figure 8: Reason for Developing OHSMS.

Figure 9 shows sources the contractor got health and safety advice from i.e. Safety consultant/officer and DOSH (95%), CIDB (75%), SOCSO (60%), NIOSH (55%), Local Authority (10%), Contractor service center (10%), Internet (15%).

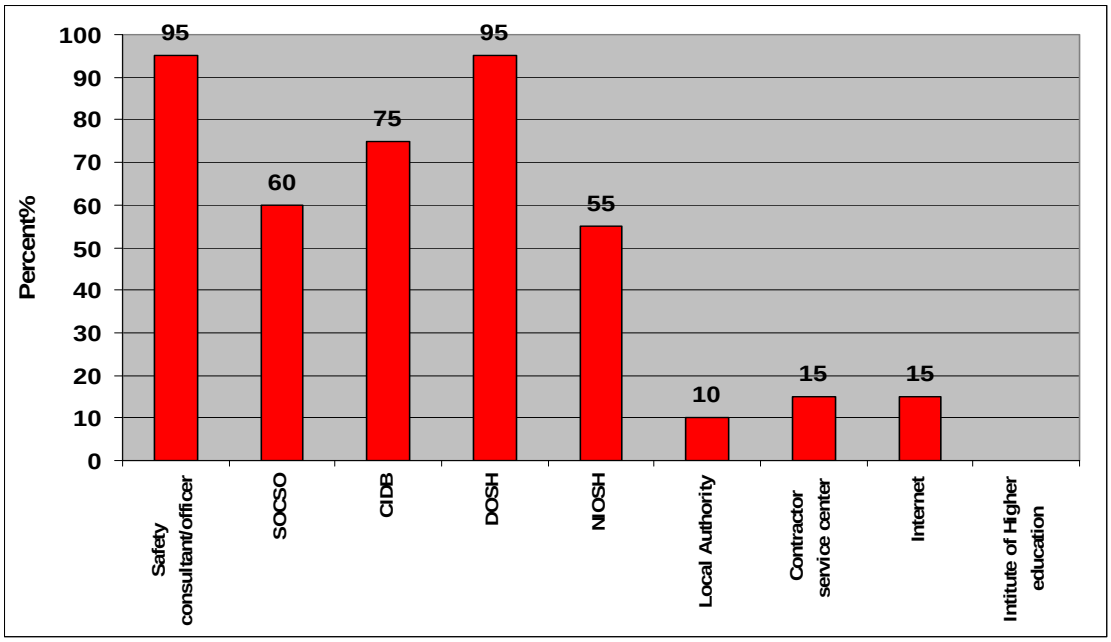

Figure 9: Sources to Get Health and Safety Advice/Information

4.3 Section C: Nature of Expenditure and Benefits of the Compliance

Figure 10 shows main health and safety expenditures among respondents i.e. Workers training and personal protective equipment (90%), safety tool (60%), payment for H&S officer (25%), and safety consultant (35%).

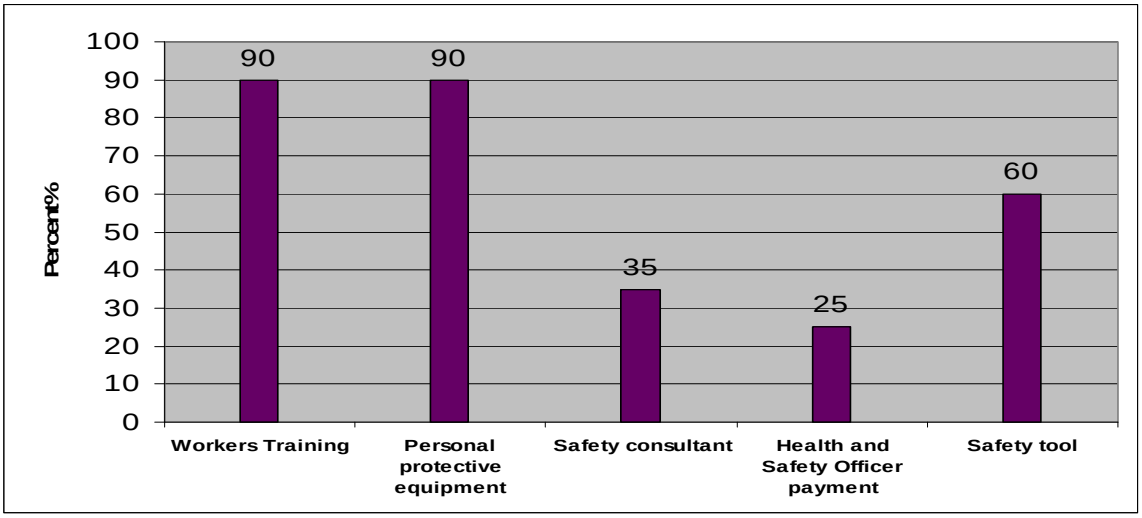

Figure 10: The Main Health and Safety Expenditures.

Table 1 shows the impact of the compliance with OHSMS. The values in each cell represent frequency of respondents choose the impact regarding the aspect. Insurance premiums (60%) and number of staff employed (80%) recorded no effect. In positive side, Performance (80% increase), staff morale (55% increase), sickness absence (70% decrease, 5% increase), time lost through accident (80% decrease, 5% increase). For negative side, Compensation claims (20% increase, 10% decrease), staff turnover (20% increase, 10% decrease).

Table 1: Impact of the Action Taken

Impact (%) / Aspect	Increased	No effect	Decreased	Too early to say	Don't know
Compensation claims	20	25	10	20	25
Insurance Premiums	10	60		15	15
No. of staff Employed	15	80		5	
Performance Of employees	80			10	10
Sickness Absence	5	15	70		10
Staff Morale	55	15		10	20
Staff turnover	20	30	10	25	15
Time lost Trough Accident	5	10	80		5
Quality of work	30	15		15	40

Figure 11 shows the comparison between cost and benefits from respondent's perception on implementation of OHSMS. About 35% felt benefits outweighed the costs and 25%

said conversely. Around 25% felt they were even broken and 15% just don't know or in the state too early to say.

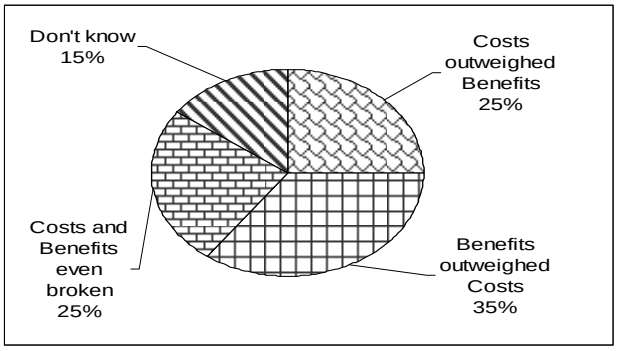

Figure 11: Comparison between the costs and benefits of OHSMS implementation

4.4 Section D: Cost of Compliance with OHSMS

Table 2 shows the cost provide by contractors in compliance with health and safety management system. The cost was calculated and classified from total project value.

Table 2: Cost of compliance

Project Value (million) / Items	**RM1 – RM5 (Min – Max), (%) (2 respondents)**	**RM5 – RM10 (Min – Max), (%) (3 respondents)**	**RM10 – RM20 (Min – Max), (%) (12 respondents)**	**>RM20 (Min – Max), (%) (3 respondents)**
Workers Insurance	0.022-0.067	0.038-0.094	0.020-0.064	0.030-0.500
Safety Inspection	0.022-0.067	0.020-0.094	0.007-0.027	0.012-0.150
Safety Meeting	0.022-0.067	0.020-0.038	0.006-0.027	0.005-0.012
Workers training	0.067-0.067	0.020-0.038	0.007-0.188	0.000-0.030
Safety officer/ Consultant payment	0.067-0.167	0.060-0.094	0.009-0.188	0.015-0.030
Safety tools	0.022-0.022	0.060-0.375	0.020-0.188	0.015-0.120
Personal protective Equipments	0.022-0.022	0.020-0.375	0.006-0.188	0.030-0.120
Supporting equipments for Administration, Management, and Documentation.	0.022-0.067	0.038-0.094	0.019-0.188	0.015-0.120
Min-Max (Σ %)	0.36-0.46	0.31-1.08	0.15-0.85	0.19-0.74
Average (Σ %)	0.410	0.663	0.342	0.473

Figure 12 shows Estimated Expenditure compared to Actual Expenditures. We can see that actual expenditures were much lower than estimated. The estimated expenditure based on respondent's perception on the right amount of OHS cost need to be spends. The actual expenditure based on their experience.

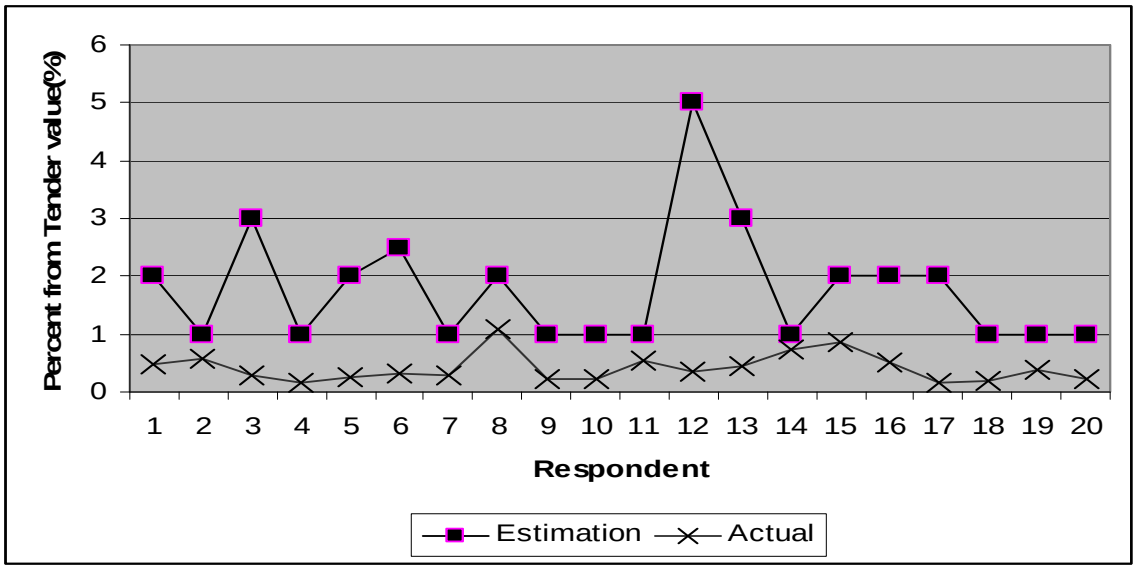

Figure 12: Actual versus estimated expenditures

5.0 Conclusion

Based on the objectives of the study conclusions are as follows:

1. Majority of contractors had Occupational Health and Safety Management System in place but they were taking different approach for some aspects of the implementation.

   (i) Most of the contractor recorded work-related accidents but few for ill-health.

   (ii) Most of contractor included basic elements like accident reporting system, risk assessment, and written health and safety policy but very few of them make performance measurement.

   (iii) Cost implication still the biggest barrier to implement formal OHSMS.

   (iv) Legal obligation became main motivation for contractors to implement OHSMS.

   (v) Government agencies like DOSH, CIDB, SOCSO and NIOSH were the main sources to seek advice about OHS management besides Safety consultant or Safety Officer.

2. The quantum of safety allocation needed in order to comply to requirement and the benefit for this effort are as follows:

   i. The cost of compliance varies from minimum 0.15% to 1.08% with average of 0.41% from project value. Workers training and personal protective

equipments are the main expenditure. The actual expenditure based on respondents experience was much lower than the estimated expenditure based on their perceptions on the right amount to spend for OHS cost.

ii. Most the respondents think OHSMS shows positive impact in some aspects such as performance, staff morale, sickness absence, and time lost trough accident while they think conversely in compensation claims and staff turnover. More respondents think benefits outweighed cost compare to those who think cost outweighed benefits.

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