



38 Safety management amongst the small contractors needs to know the significance of  
39 safety during construction which keeps up safety at sites. According to Fabiano et al.  
40 [2], opposite relationship between the company size and level of occupational accidents  
41 is exist. It can so be argued that small workplaces are more probable to have accidents  
42 than larger ones. The contractor ought to recognize the safety risks and prevention  
43 rehearses which every each will convey directly to construction site. Through safety  
44 administration, the employer can guarantee the safety coordination, safety orientation,  
45 and practices of safety organizations.

46 The safety management system will guarantee the work performed to determine  
47 prerequisites is set up, reported, actualized and kept up. Safety management system, the  
48 parts of hierarchical, as far as its capacities, Personnel Protective Equipment (PPE),  
49 safety management instruments, cooperation with different divisions, safety  
50 management project and safety management hones. Previous findings revealed that the  
51 successful development and application of SMS would help in preventing the accidents  
52 from happening in the construction industry [3; 4; 5; 6]. According to Fewings [7],  
53 good Health and Safety performance in the construction industries of developed  
54 countries are largely attributed by systematic implementation of Health and Safety  
55 management practices as stipulated in Health and Safety management systems. Hence,  
56 there is a need for a comprehensive understanding on the safety measures by all  
57 contractors and project administrators.

## 58 **2 Literature Review**

59 The safety management system (SMS) should be actualized to lead security approach  
60 and enhance the safety execution at every level of authoritative and person and  
61 incorporates direction on the safety, guideline and documentation, safety preparing,  
62 crisis readiness as well as reaction arrangement and safety approach. The safety  
63 management approaches can be undertaken by critically observing the company's  
64 safety policies, safety procedures and practices, particularly during its implementation  
65 on construction site [4] in addition to executing a safety management program into each  
66 of construction activities.

67 Projects are complex in nature, as they involve technical, procedural, organizational  
68 and human elements in an integrated manner [8]. Hence, after reviewing the safety  
69 levels, assessment an arrangement are ought to be created with a specific end goal to  
70 actualize the quality system. Besides that, the way towards safety management system  
71 is by distinguishing and building up the controls, forms, hardware, abilities and assets,  
72 besides it has to guarantee that all outlines, strategies and documentation are  
73 appropriate, upgrading control, testing and examination procedures, recognizing any  
74 estimation prerequisites, clearing up acknowledgment benchmarks as well as  
75 distinguishing quality records to name a few. Several control components in a quality  
76 system arrangement also need to be incorporated to the system including formal  
77 reporting, records of activities, review of the reports, problem discoveries and so forth.  
78 Moreover, in leading the strategy for executing safety in the construction process, the  
79 contractor must be a part of the safety management system. Thus, failure to implement

80 SMS on site will lead to the numerous dangers and risks. Therefore, employers and  
 81 workers had to formulate and implement health and safety policies and procedures to  
 82 manage health and safety risks [9; 10; 11].

83 Furthermore, the factors of issues in the safety management system with a specific  
 84 end goal to evade and control the dangers are the contractor does not build up the safety  
 85 inspection, absence of data in regards to the danger control program which the  
 86 contractor did not assess the hazard and risk frequently. According to Goh and Chua  
 87 [12], construction safety risk assessment helps to improve the efficiency and quality of  
 88 new hazard identification. It is the contractor's obligation carry out the risk assessment  
 89 in accomplishing an effective health and safety on site. Besides that, safety instructions  
 90 and safety training should be provided at extraordinary levels as when degree of safety  
 91 information stands low. It is conceivable that danger might be happen during the project  
 92 execution. Meanwhile, health and safety management issues in small businesses are  
 93 related to lack of adequate resources to address health and safety issues, as well as lack  
 94 of knowledge of the firm's health and safety risks [13]. Therefore it is important to note  
 95 that, the lack of risk-related knowledge and resources contributes to accidents on site  
 96 and the aim of this paper is to recommend the best practice of safety management  
 97 system amongst small contractors in Selangor, Malaysia. The next section describes  
 98 methodology an analysis used in the study.

### 99 **3 Methodology and Analysis**

100 Questionnaires were distributed to 100 respondents with the feedback of 35% replied.  
 101 In terms of respondent profiles, out of 35 respondents, 15 respondents (43%) is from  
 102 Grade G1 and 20 respondents (57%) are contractors registered under MCIDB. Most  
 103 respondents have working experiencing between 5 to 10 years and all respondents  
 104 understood and implementing the safety management system on the site. Majority  
 105 implemented safety procedures, risk control, review safety procedure and prepared  
 106 health and safety policy and safety plan. They also conducted the safety inspection and  
 107 safety audit of work undertakings. Majority of the respondents did conducting safety  
 108 inspection and safety audit. Majority contractors conducted the safety audit on daily  
 109 basis and (34%) from its not conducting the safety audit and provide It shows that (97%)  
 110 of the small contractors are providing the Personal Protection Equipment (PPE) to the  
 111 labourers on site while carrying out the works. However, its shows that (80%) of  
 112 respondents does not conduct the training programs for labourers on site.

113 It shows that (91%) of the respondents implement health and safety for labourers in  
 114 construction sites and majority carry out the risk assessment on the work site and did  
 115 not have the system to manage the hazardous substances. They did not do the reporting,  
 116 recording and investigation of incidents, injuries and illness. Majority are not having  
 117 the safety committee. It shows that (74%) of the majority are having the safety meeting  
 118 on site.

119 **Table 1.** The main factors of accidents occurred on construction site.

No.	Factors	Mean	Rank
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A1	Unsafe of employees attitude	4.40	1
A2	Unsafe conditions of materials, plants and equipments	3.94	7
A3	Ineffective of training instruction	3.80	9
A4	Use of alcohol and drugs	4.34	2
A5	Inadequate maintenance	4.09	6
A6	Lack of communication	4.20	4
A7	Improper motivation of operational personnel	3.91	8
A8	Improper safety rules or guidelines	4.14	5
A9	Improper machine controls	4.23	3

120 Table 1 shows that the main factors occurrences of accidents on the construction site.  
 121 Majority of the respondents agreed to the facts that the factor of factors the accidents is  
 122 unsafe of employer attitudes with the average index value is 4.40, followed by the use  
 123 of alcohol and drugs with the average index value is 4.34. The third factors of accidents  
 124 agreed by respondents is improper machine controls which have the average index  
 125 value of 4.23, followed by lack of communication, improper safety rules or guidelines,  
 126 inadequate maintenance, unsafe conditions of materials, plants and equipment,  
 127 improper motivation of operational personnel, ineffective of training instruction. Based  
 128 on the value index, majority is agreed that the most factor that causing accidents on the  
 129 site is unsafe of employer attitudes while carrying out the works. Because of the  
 130 workers may be lack of knowledge and training programs provided by the employee.

## 131 **4 Discussion on the Findings**

### 132 **4.1 Understanding safety management system in construction industry**

133 From the findings, 34 out of 35 respondents are implementing the safety management  
 134 system on the site with the total of 97% of the respondents agreed in implements of the  
 135 safety management in the construction operation. However, findings also shows that  
 136 some of the small contractors lack in performing the safety management system. Due  
 137 to lack in performing the safety management system, it can lead to risk and hazard that  
 138 cause accidents. The uncontrolled of safety and health on construction sites may cause  
 139 hazardous conditions go unchecked, which can cause death or serious injuries and  
 140 contractor who have bad safety records or perform their work in an unsafe manner are  
 141 very culpable [14]. Findings also signifies that the majority of small contractors is not  
 142 conducting the training programs for labor on site which means that the labours are not  
 143 receiving the adequate knowledge regarding the safety while undertaking the works.  
 144 Arocena and Nuñez [15] highlight the importance of good access to public support and  
 145 training activities in establishments adopting more comprehensive Occupational Safety  
 146 and Health management systems. It can therefore be concluded that lack of knowledge  
 147 and resources contributes to the issue of accidents. The result of the findings can be  
 148 strengthened based on the study of the ESENER data undertaken by The European  
 149 Agency for Safety and Health at Work (EU-OSHA) [16] of all establishments partaking

150 in the survey as they recommends that a lack of resources such as time, staff or money  
151 (36 %), a lack of expertise (24 %), and the culture within the establishment (24 %) are  
152 several of the main barriers to the application of Occupational Safety and Health  
153 management reported by the respondents.

154 Therefore, the small contractors need to overcome this problem through the  
155 implementation of the safety management system by way of exploring the knowledge  
156 on the safety and allocate the reasonable amount of cost for safety coverage and  
157 expenditures as outlined by the OSHA regarding the safety and health while carrying  
158 out the construction works. According to Baxendale and Jones [3], the on-cost for  
159 smaller sized projects was more substantial as the cost of developing the health and  
160 safety plan as it was often disproportionate to the value of the project.

#### 161 **4.2 Safety Management System to Avoid and Control Risk during** 162 **Construction Operation**

163 The implementation of the safety management system to avoid and control the risk  
164 during the construction, operation depends on the level of the safety management  
165 employed by the contractors. From the findings, most of the small contractors are  
166 implementing health and safety for labourers in construction sites, providing the risk  
167 assessment on the site and conducting the safety meeting. Further, by just implement  
168 health and safety, providing risk assessment, and conduct site meeting it is not enough  
169 to avoid and control risk during the construction operation. The contractors need also  
170 to have safety committee and a formal of the reporting, recording and investigation of  
171 incidents, injuries and illness system to enhance the effectiveness for prediction of  
172 future similar events from happening and ways to overcome. Due to the uncompleted  
173 system of safety being implemented it will not do any better towards the safety,  
174 performance, to reduce the accident rate the small contractors need to have a proper  
175 safety management system. Based on their own research and discussions with experts,  
176 Gallagher et al. [17] recommend that Occupational Safety and Health Management  
177 Systems can deliver more healthy and safe workplaces, but only under the right  
178 circumstances. EU-OSHA [18] also finds that the application of Occupational Safety  
179 and Health Management Systems can lead to positive effects such as a reduction in  
180 accidents and a rise in workers' motivation.

181 However, it may not make sense for small companies to analyze the reasons for  
182 absenteeism formally or to appoint a health and safety representative. Many of these  
183 companies may have informal approaches and limited resources and expertise [19].  
184 According to Hasle et al. [20], smaller sized companies take the less systematic  
185 approach to risk management and focus less on preventative measures. The exposure  
186 to risk factors at work causes real harm to the health and safety of labourers [21].  
187 Therefore, it is an important element that the small contractors need to implement the  
188 safety management system to avoid and control the risk.

### 189 **4.3 Factors of problems in construction sites without safety management.**

190 From the findings, table 5.20 shows there are nine factors that contribute to the issues  
191 occur on construction sites without safety management. Most of the respondents agreed  
192 that the major factors of problems occur on construction sites without safety  
193 management is unsafe of employee's attitudes while commencing the work shows the  
194 average 4.40. Kaskutas et al. [22] also found that unsafe behaviour were negatively  
195 associated with employer size. The second highest factor is the use of alcohols and  
196 drugs shows the average 4.34 which can contribute to the dangers to other people and  
197 worker itself. The third highest factor is unacceptable machine controls which it shows  
198 the average 4.23. HSE [23] also concluded that worker behaviour is a causal factor in  
199 approximately 80% of the accidents.

200 However, the lowest factors of issues occur on construction sites is unsafe ineffective  
201 of training instruction. Major numbers of respondents agreed that ineffective of training  
202 instruction is not the major factors of issues occur on construction sites. The reason is  
203 attitude if the employee itself. Many studies discovered that the majority of accidents  
204 and resulting injuries are accredited to unsafe work practices of the workers rather than  
205 unsafe working conditions [24]. Therefore, the small contractors need to implement the  
206 safety management system to reduce and avoid risk from happen in construction site.

## 207 **5 Conclusions and Recommendations**

208 It can be concluded that if all eight of the methods is used in implementing the safety  
209 into construction sites, the accidents, incidents, risks and hazardous can be minimized  
210 and avoided from taking place in construction sites. The safety management system  
211 must be developed, implemented and conducted on construction sites in order to lessen  
212 the hazards and risks, and can accomplish the objectives of the project. From the data  
213 gathered, it can be concluded that the majority numbers of respondents are  
214 implementing the safety management system as to control and avoid the risk in the  
215 period of construction, operation and also the small contractors are applying the health  
216 and safety of the laborers, providing the risk assessments and having safety meeting.  
217 Data gathered also shows that other safety management system such as system in  
218 managing the hazardous substances, safety committee and recording and investigation  
219 of incidents, injuries and illness are less to be undertaken by the small contractors might  
220 due to the reason of less knowledge and resources to implement it.

221 In terms of recommendation, small contractors need to apply the safety management  
222 methods on all work involved in the construction in order to preventing and controlling  
223 the hazards and risks that may happen. Besides that, the contractors need to provide and  
224 carrying out the safety training programs and safety training policy to the workers by  
225 giving the instruction, providing the knowledge and information regarding the safety  
226 management in carrying out works to ensure the workers are alerted for precaution  
227 towards emergency situation. Moreover, contractors need to implement the safety  
228 planning according to the Occupational Safety and Health management to ensure to  
229 achieve the objectives of works without any incidents.

230 Small contractors must provide Personal Protection Equipments (PPE) for all of the  
 231 workers on construction site according to the suitability of the works for their safety  
 232 protection. Thus, the level of hazards or risks can be minimized or avoided. The  
 233 contractors also need to ensure safety management system needs to be developed,  
 234 implement and conducting in a construction project to achieve the objectives of the  
 235 projects as well as to avoid any accidents or incidents to the workers. Furthermore, the  
 236 safety meeting and safety committee need to be developed. This is to ease the procedure  
 237 to analyse the risks that occurs by having the documentations from previous data of  
 238 risks to be reviewed for latest risks happened. This is to analyse the risks and suggesting  
 239 the ways to preventing the risks to be happening. The study also suggests that the small  
 240 contractors needs to have an adequate amount of resources to implement health and  
 241 safety management also increase in the level of knowledge regarding the health and  
 242 safety management to be able to apply it.

243 Small contractors need to develop the safety meeting and safety committee, this is  
 244 to ease the procedure to analyse the risks that occurs by having the documentations  
 245 from earlier date of risks to be reviewed for latest risks happened. This is to analyse the  
 246 risks and suggesting the ways to preventing the risks to be happening. Hence, the risk  
 247 assessment needs to be provided and implement in order to ensure the risks and hazards  
 248 are identified, to make sure all aspects of the work undertakings are to be reviewed, to  
 249 reviewing the operation of plants, machines and equipment control and identify the  
 250 possibility of the risks and hazards which might happen in construction sites. Thus, the  
 251 safety inspection, safety audit and safety performance will need to be evaluated  
 252 continuously to improve the safety management system in the future. The safety  
 253 inspection and safety review need to be provided to evaluate the operation of safety  
 254 management system and organization of the project in achieving the objectives.

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