

An Overview of the Management Commitment to Safety Elements for Mitigating Accidents in the Construction Industry

Hamdi Abdul Hamid^a, Mat Naim Abdullah @ Mohd Asmoni^{b*}, Muhamad Amir Afiq Lokman^a, Nursyamimi Shaari^a

^aDepartment of Real Estate Faculty of Geoinformation and Real Estate, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia

^bCentre for Real Estate Studies, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia

*Corresponding author: matnaim@utm.my

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Abstract

Due to the importance of management commitment to safety for influencing workplace safety performance, this paper aims to investigate the current literatures, prepare a compilation and gap related to the demonstrated management commitment to safety and its elements that mitigate workplace accident in the construction industry through a clearly structural methodological approach. Hundreds of articles were explored using article keyword identified from the literature reviews. The articles abstract were reviewed repeatedly resulted in 61 relevant articles for compilation of management safety commitment including related articles from other industry. The elements of management commitment to safety were identified using content analysis and inductive coding technique. Apart from that, critical analysis was conducted to identify gaps in the literatures. From the content analysis, a total of 19 elements reflected the management commitments to safety were identified. Additionally, it was found that lots of studies have been done on safety commitment in specific aspect but more comprehensive research regarding cause and effect of actual safety commitment is suggested.

Keywords: Commitment; management; occupational safety and health; construction

Abstrak

Disebabkan oleh kepentingan komitmen keselamatan daripada pihak pengurusan dalam mempengaruhi prestasi keselamatan di tempat kerja, maka kertas kerja ini bertujuan untuk mengkaji literatur terkini, menyediakan kompilasi dan jurang kajian berkenaan komitmen keselamatan oleh pihak pengurusan serta elemen-elemennya yang mengurangkan kemalangan pekerjaan dalam industri pembinaan melalui pendekatan metodologi yang berstruktur. Pencarian artikel dengan menggunakan kata kunci yang terdapat dalam literatur telah mengenal pasti ratusan artikel. Abstrak dalam artikel disemak berulang kali dan memperolehi 61 artikel berkaitan dengan elemen komitmen keselamatan yang dipamerkan oleh pihak pengurusan termasuk artikel dari industri lain turut dikompilasikan. Kaedah analisis kandungan dan teknik pengekodan induktif diguna pakai bagi mengenal pasti elemen yang mempamerkan komitmen pihak pengurusan dalam keselamatan. Selain itu, analisis kritikal dilaksanakan bagi mengenal pasti jurang kajian dalam literatur. Hasil analisis kandungan telah mengenal pasti sebanyak 19 elemen yang mencerminkan komitmen pengurusan terhadap keselamatan. Sebagai tambahan, banyak kajian telah dilakukan berkaitan komitmen pengurusan terhadap keselamatan dalam aspek tertentu. Namun, dicadangkan agar lebih banyak penyelidikan yang menyeluruh mengenai punca dan kesan oleh komitmen keselamatan yang sebenar dilakukan.

Kata kunci: Komitmen; pihak pengurusan; keselamatan dan kesihatan pekerjaan; pembinaan

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1.0 INTRODUCTION

Apart of emphasising on quality for sustaining continuous existence, organizations have begun to include the Occupational Safety and Health as one of determinants for improving productivity and efficiency to stay competitive ever since the past several decades¹. Apparently, the construction industry is not

spared from this; several of the top companies have entered the era of human failures prioritization and organizational factors due to low safety performance². Currently, the construction industry is considered as having higher rate of accidents compared to other sectors³⁻⁶.

According to Ridley⁷, unsafe acts or unsafe condition or the combination of both have caused most of the accidents. So, it

appears that accidents may happen if there are influences from internal and external elements. Based on previous studies, one of the main causes for accident is the lack of commitment shown by the construction management on handling OSH issues in the industry^{8,9,2,10-12}.

Consequently, as one of the key aspects for implementing safety interventions, the management commitment to safety should be given acknowledgement and emphasis in enhancing the safety of a workplace¹³⁻²¹. Throughout this article, “Management Commitment to Safety” will be referred to as “MCS”.

MCS can be defined as “the extent to which management is perceived to place a high priority on safety and communicate and act on safety issues effectively”²². However, previous studies have vaguely used the occupational “management” term because of the existence of various management categories starting from the Chief Executive Officer (CEO) to the first-line supervisor²³. Therefore, the importance of clarifying the management position being assessed due to many different levels and roles of manager in safety management is crucial²⁴. According to Cooper¹³, the management commitment can be generally measured in two ways; through direct approach of questioning managers²⁵ and through monitoring of their commitment behaviours²⁶. By applying either one or both of these approaches and by determining the level of management being assessed, researchers can discover various positive outcomes of MCS. Among them are increased safety climate, reduced turnover, improved safety behaviour by 40 percent, reduced lost time injuries by 82.2 percent and minor injuries by 35 percent, more productive employees, decreased employers costs due to the reduction of health claims, lower inpatient and outpatient hospital costs, reduced worker absenteeism and life insurance costs, continuous improvement of safety program and eventually, greater overall success^{27-31,13,32-36}. These benefits are gained only by the organizations that are committed at various management levels in the safety endeavour which positively influence their safety performance.

Nonetheless, the issue of lack of safety commitment among the construction sector players is a cause for concern. Lack of safety commitment can be seen from their lackadaisical attitude toward safety and lack of effective leadership within the organization and management³⁷. In addition, the management seems to focus more on gaining profits than securing safety¹². Furthermore, the importance of MCS for instilling safety culture into the organization was only merely being highly expected and believed by the organisation senior management after seeing their actual and nonchalant conducts for safety practices³⁸. Lacking of safety commitment can also be caused by the management not having keen interest in addressing safety issues¹¹ and they are not complying with the existing act provision²¹. Lacking of safety commitment by the management can be a barrier to workers behaviour change and engagement⁹. Moreover, it leads to poor inspection programs, poor safety policies, incomprehensive accident prevention policies and insufficient education program⁸.

Walton³⁹ stated that the management has the legal authority and responsibilities in controlling employees’ behaviours. Hence, it is imperative for the management at every level to have full commitment in preventing and managing accidents by ensuring the right measures and goals in mitigating mishaps at workplace. Mishaps at the workplace such as employees’ injury, disability or fatality will cause an increase in the operational cost due to the overtime work, loss of machine and man working hours, insurgency wages and equipment, low productivity and quality, hiked insurance and compensation payment and disrupted schedule. Mishaps at the workplace can also cause a loss of goodwill among an organization’s stakeholders and taint the organization’s image or internal climate in which eventually, will bring undesirable impact on the organization’s profitability^{27, 40-44}.

Hsu, Lee, Wu and Takano⁴⁵ said that the top management commitment in safety came from their positive attitude toward safety. Many research have investigated MCS at various management levels in different industries such as by Huang, Verma, Chang, Courtney, Lombardi, Brennan and Perry⁴⁶, Ginsburg, Chuang, Berta, Norton, Ng, Tregunno and Richardson⁴⁷, Hansez and Chmiel⁴⁸, Yule and Flin⁴⁹, Watson, Scott, Bishop and Turnbeaugh⁵⁰, Michael, Evans, Jansen and Haight⁵¹, O’dea and Flin¹⁹ and Rundmo and Hale⁵².

In further investigating MCS and the issues involved at various management levels, a literature review on OSH in construction is needed. This is highly recommended by prior researchers such as Swuste, Frijters and Guldenmund⁵³ who have proposed on investigating the cause-effect chains of accident processes in detail, so that more specific measures, solutions and interventions can be created in avoiding or reducing the effects of accident scenarios.

Additionally, Abudayyeh *et al.*²⁷ have suggested for more studies to be conducted in determining the impact of safety culture, empowering employees in safety practices, monitoring and improving safety mechanisms, and studying employees’ involvement regarding the incident rate. Hence, conducting this research is essential in understanding the nature of accidents causes and its relationship with MCS at the construction site.

Moreover, it is the social responsibilities of the management to be committed to OSH for their employees’ well-being and benefits. As believed by Dodge³⁷, the managers and directors have to put their best interest on workers’ safety in the most humanistic approach as possible.

In conclusion, this paper seeks to compile relevant elements that mitigate accidents at the construction site, analyse each element and identify the potential gap in the OSH research related to MCS. In the following sections, the selected research methodology, the summary of MCS elements and its concepts, and the critical analysis of the MCS in OSH literature will be explained.

■ 2.0 RESEARCH METHODOLOGY

2.1 Compilation of the Management Commitment to Safety Elements

In reviewing the literature on MCS and its elements, the conceptual analysis approach has been adopted. Articles containing references to MCS in OSH literature were carefully analysed and coded as the construct of this research.

According to Miles and Huberman⁵⁴, this analysis helps to differentiate and combine the gathered data. In addition, Finney and Corbett⁵⁵ have stressed on the meaning of the word and not on the actual state of the word. Therefore, every demonstrated commitment to safety made by the management which affected the safety performances in an organization was taken into consideration regardless of their descriptions and they were sorted into elements.

Furthermore, an inductive coding technique was applied in this analysis. As stated by Strauss and Corbin⁵⁶, “open coding” is the part of an analysis which pertains specifically to the naming and categorizing of phenomena by thorough examination of data. During open coding, the data is broken down into discrete parts, closely scrutinized, similarities and differences are identified, and questions related to the phenomena as reflected in the data are asked.

Further, as a part of the methodology, Strauss and Corbin⁵⁷ have suggested on preparing the qualitative data category cards technique. In this study, by using the Endnote 7 software (one of the latest referencing management software programs), the coded

construct were separated into each respective journal articles. In addition, each noted construct of MCS was placed and recorded in frequencies for each element by using the worksheet file (Microsoft Excel). To gain in-depth understanding on various MCS elements, the content analysis approach is commonly and appropriately technique to be applied in analysing written texts as invoke by Silverman⁵⁸. Furthermore, Silverman⁵⁸ advised for individual to perform a good coding scheme which reflected a search for ‘uncategorized activities’ and included them in the coding scheme because there are certain coding which may not be identified straightforwardly. Consequently, any references related to “MCS” elements may not necessarily classify as such in this analysis due to some of the search terms may not always include “safety commitment” or “management commitment to safety”.

2.2 Data Collection Procedures

According to Carley⁵⁹, there are eight coding steps in the data collection procedure. These steps are applied in this study, to compile the MCS elements.

Step 1: *Determine the Level of Analysis*. The first step for performing content analysis is to determine the level of the chosen sample and units of analysis to be counted as stated by Berg⁶⁰. In this step, the author decided whether to search for a single word or a set of words. The entire journal articles were classified whether by the unit or level of analysis. Thus, extensive searches of data collection phase for literature review in various journals were performed and they were not limited to journals outlined below:

- Safety Sciences
- Safety Research
- Construction Engineering and Management.
- Construction Management and Economics.
- Prime Research on Education Journal
- Procedia - Engineering Journal
- Procedia - Social and Behavioral Sciences Journal
- Accident Analysis and Prevention Journal

In addition, the searched database which consists of Science Direct, Web of Science, Scopus, Emerald Insight, Google Scholar, J Stor, and Taylor and Francis were also involved in the searches process. In the database, dozens of journals and hundreds of articles related to the Occupational safety and health field were identified. Then, the process of selecting articles from the search results were conducted using the search terms and conditions as outlined in Table 1.

Table 1 Search terms: journals and databases

| Searched: citation, abstract and title | |
|---|--|
| Individual Journal Searches | Database searches |
| Management commitment to safety in Construction | Management commitment to safety in construction |
| Commitment to safety by construction management | management commitment in construction towards safety |
| Management safety commitment | Commitment towards safety by construction management |
| Management commitment in safety | Management commitment in safety |
| Management commitment towards safety | Management commitment “AND” occupational safety and health |
| Safety commitment by management | Management “AND” safety commitment |
| Commitment “AND” management safety | Commitment “AND” management safety in construction |

For database search, the used search keywords were chosen based on keywords used by researchers. In addition, the focus has been set on the importance of “MCS” in the construction sector but relevant points in articles from other industry were also considered into the compilation. Lastly, the searches were restricted to journals with impact factor or high cited ones. Then, for articles which would be inserted in the compilation, it depended upon the author’s decision after reading the article abstract, introduction, title and conclusion whereby if the articles contained any information related to the MCS element, then the selected articles would again undergone for further review.

Step 2: *Be Specific on How Many Steps to Code for*. In order to verify the code for a specific pre-determined set of concepts or to allow more interactive coding approach, the coding process was involved in this step. The inductive approach was applied in this study because of its suitability and it allows for absolute inclusion of all identified MCS elements. By referring to Berg⁶⁰, theoretical classes are those “emerge in the course of analysing the data”. Subsequently, any element of MCS known from literatures was included into the classes of this research.

Step 3: *Decide Whether to Code for Existence or Frequency of a Concept*. In this step, decision for coding the frequency of the concepts was made in order to fully grasp the significance of element through determining the frequency of a concept.

Step 4: *Decide on How to Distinguish Among Concepts*. In this step, researchers need to be certain in making the decision; either change it into different coded form or keep it in the actual context. This step actually emphasize on the level of terms generalization⁵⁵. Thus, any words of similar interpretation were categorized under the same construct. For example, “allocation of budget” and “allocation of resources” have comparable gist, so both were inserted into the interchangeable category of element.

Step 5: *Develop Rules for Coding Your Texts*. It is crucial to guarantee constancy when performing internal validity once the coding process started. Next, it is also important to establish and applied a set of translations procedure during the coding process as shown below:

- Any article related to “MCS” study in construction and other industries were initially interpreted and focused in extracting all possible references. Furthermore, all relevant elements and concepts were highlighted in the reference management software program (Endnote7). During the initial process of interpretation, the definitions, elements and MCS gaps were not yet identified but this predicament was solved after reading the articles from various journals and databases. In addition, any relevant MCS element which was considered vital and had positive results on minimizing accident cases was compiled. Lastly, the appropriate research methodology on MCS elements was determined the ways of solving issues of lack MCS at construction sites were discovered during data collection.
- All related articles were revised again to determine if there were similarity of concepts in OSH literature and any similar concepts were placed in group of elements.
- Each element and its concept were reviewed again to determine the possibilities of collapsing or subdividing and establishing any additional element.
- After confirming the elements, each concept of the elements was reviewed to conclude the constructs terms which may come from one of the coded or a new construct term.

Step 6: *Decide What to Do with “Irrelevant” Information*. This step was mainly on deciding the next process for the un-coded text information. However, no issue of irrelevant coded information has occurred due to the focus of this study which was on the compilation of MCS elements in OSH. Hence, those aspects

which clearly indicated the possible MCS elements were coded in text during the content analysis of the articles.

Step 7: Texts Coding. By following every translation rules stated in step 5, manual technique of the actual coding process was applied in this step. The actual name attached to the element was retained due to Strauss and Corbin⁵⁶ stated that it is reasonable for maintaining the signified name of the data, and also sufficiently detailed to explained its referent.

Step 8: Analysing the Results. This is the final stage which involved reviewing process of the constructs in terms of frequency along with critically evaluate of all the MCS elements. Hence, these frequencies of MCS elements results will be reviewed in the following sections.

2.3 MCS Elements Literature Compilation

Discovering the Elements

91 articles were reviewed and 61 were considered to contain “MCS” elements. The first analysis stage involved the grouping of “elements” and each element that provided the same information was grouped together. From 81 possible elements, 19 were finalized as MCS elements after successive analysis on relevant articles from construction and including other industries such as manufacturing, and airlines industry. All in all, in the final stage of the analysis, 19 possible elements of MCS were identified in mitigating accidents.

Naming of the Elements

There was no need to select the names in identifying each element because the elements selected were obvious and clear, which allowed readers to determine their reference. The selected element name was chosen based on the frequent used of its concept in the literature (i.e. “Personal Protective Equipment”). However, Strauss and Corbin⁵⁶ informed researchers on the risk of using borrowed terms and suggested being more specific on the terms meaning that were used. The final 19 elements of the MCS been identified were shown in Table 2.

Table 2 Elements of MCS in OSH

| Elements of management commitment to safety (MCS) in Occupational Safety and Health | |
|---|---|
| 1. Accident Investigation | 11. Demonstrate Leadership |
| 2. Safety Training | 12. Management Support |
| 3. Allocating Resources | 13. Decision Making |
| 4. Personal Protective Equipment | 14. Conduct Toolbox Talks |
| 5. Communication | 15. Safety Participation |
| 6. Positive Attitude towards Safety | 16. The existence of safety culture |
| 7. Safety Programmes | 17. Boundary Spanning |
| 8. Empowerment | 18. Visibility |
| 9. Motivation Of Workers And Safety Personnel | 19. Continuous monitoring and improvement |

2.4 Understanding the MCS Elements and Their Concepts

Each identified MCS element is outlined below with a straightforward description of the concept it represents.

Awareness creation—This concept referred to the need of accident prevention through safety enlightening^{61, 62}. According to Pirani and Reynolds⁶³, safety awareness is highly related to personal attitudes than anything else. Based on previous studies,

this element can lead to the improvement of productivity which then boost profit^{43, 64}. At the construction site, provision of safety booklet was found as one of the element influencing safety performances where this book provides brief safety induction to every new recruit on their first week⁶⁵.

Accident investigation—According to Lundberg, Rollenhagen and Hollnagel⁶⁶, typically, the accident investigation is known as a practices which assume on the causes for accident occurrences and performing preventive action. Consequently, this practice involved on carrying out of periodical safety audit and the implementation of its recommendation, accident reporting through publication of magazines, journal articles, newsletters, etc. and systematic monitoring of incidence of safety⁴⁰.

Decision making—Fruhen, Mearns, Flin and Kirwan⁶⁷, stated that decision making refers to managers’ capabilities in effectively engaging safety problems in many angles; also aiming at gaining a deeper understanding through the use of multiple information sources in making decision which would positively affect safety. The demonstrated commitment to safety by the managers will be evaluated by the workforce based on the decisions been made.

Safety training—Wilkins⁶⁸ has claimed that many industry leaders have positively responded to the increasing number and content of health and safety training programmes. This may due to the fact that training would enhance safety at the workplace^{65, 69}. According to Fernández-Muñiz, Montes-Peón and Vázquez-Ordás⁷⁰, the aim of training and developing employees’ competences is to provide workers with the required capabilities and skills to properly carry out their tasks. So this concept allows employees to have awareness and knowledge about risks at the workplace and they are also equipped with practical countermeasures in safety management through their direct involvement⁴².

Motivation of workers and safety personnel—Motivating workers and safety personnel can be influenced by the level of MCS. As described by Adebisi and Charles-Owaba⁴⁰, motivating employees can be reflected through many activities such as giving safety award scheme for good housekeeping, holding health and safety competition among the employees, or holding a suggestion competition in ways to enhance safety that offers attractive prize. Similarly in motivating the contractors at the construction site, safety incentives and penalty (I/P) were applied and the results have shown a reduced number of accidents and better safety performance compared to the project with no I/P provisions⁷¹.

Allocating resources—According to Schein⁷², allocation of budgets indicate the management’s assumption and beliefs. In the context of allocating the resources, efficient safety activities will require sufficient fund or financial support to ensure a construction site’s safety³⁸.

Demonstrating leadership—Many industry players, regulators, academics and media practitioners agreed leadership as the key component in an organisation’s safety⁷³. Kelloway and Barling⁷⁴ define leadership as “a process of social influence that is enacted by individuals in formal positions of power or leadership positions within an organisation, such as managers and supervisors”. A study by Ismail *et al.*³⁸ reveals that the existence of leadership in OSH can be measured by observing how managers or supervisors become the role models, their presence is felt at working site, they provide all the supports that the subordinates need, empower subordinates during goal setting and decision making sessions, set clear responsibilities among the subordinates and colleagues and lead the OSH activities.

Visibility—As explained by Lack⁷⁵, “there is nothing more noticeable to employees than a plant manager who regularly makes himself or herself visible and accessible by walking through the operation and randomly stopping and talking to employees about safe work practices”. Similarly, top management must be seen

being committed and involved in safety efforts by the construction employees⁷⁶.

Personal Protective Equipment (PPE)—According to Sawacha *et al.*⁶⁵, providing PPE for workers may influence the safety performance levels in an organization. In fact, it is the employer's responsibilities to provide the workforce with the necessary personal protective equipment⁴². So, an adequate number of safety equipment ought to be constantly guaranteed and in good condition mainly for PPE such as safety shoes and safety helmets⁷¹.

Communication—Vecchio-Sadus⁷⁷ state that safety communication can be described as a mechanism of knowledge either in written, verbal or graphics which comes in many form including policies and procedures, training, performance statistic, hazard and incident reports, workplaces induction, and risk assessment. According to Sawacha *et al.*⁶⁵, management who regularly communicate with their workers could have better safety outcomes. In addition, Hudson⁷⁸ stated that good communication and consultation are the correct safety cultures to be performed between management and workers in enhancing safety, increasing morale and productivity of an organization.

Safety programmes—As stated by the Oregon Occupational Safety and Health Division⁷⁹, workplace safety and health program is “a term that describe what people (business owners, managers, and employees) do to control injuries and illnesses at their workplace”. Many researchers such as Anton⁸⁰, Abdelhamid and Everett⁸¹, Rowlinson⁸² and Aksorn and Hadikusumo⁸³ have stated safety program can be an effective management elements in significantly reducing accidents as a construct for safer operations approach and creating safe working environment in the effort of helping for workers.

Positive attitude towards safety—Weigmann⁸⁴ stated that positive attitude toward safety is reveal through the ability of its upper-level management for being constant on promoting safety to all organization levels while faced with various challenges even in times of economic downfall.

Management Support—According to Jaselskis, Anderson and Russell⁸⁵, this concept referred on the amount of time spent by employees with their field safety representative at the construction site.

Boundary spanning—Generally, boundary spanning is defined as a process of networking perform by members of an organization with another member from a different organization⁸⁶. Based on Fruhen *et al.*⁶⁷, this is identified as one of the construct which reflected the senior manager safety commitment from the behavioural aspects. This term was integrated in the cooperation between the senior manager and external bodies such as regulatory bodies and universities.

Safety Participation—According to Abudayyeh *et al.*²⁷, management with clear commitment to safety allow their employees to participate in policy making. Safety participation can be describe from employee's voluntary participation in safety activities aimed on giving contribution towards the development of a supportive safety environment⁸⁷. Based on the literatures, there are several examples of safety participation such as raising safety concerns⁸⁸, voluntarily partaking in the safety meetings⁸⁹, and promoting safety programmes in the organisation⁹⁰.

Conduct toolbox talks—According to Quemard⁹¹, a toolbox talk is a formal discussion about work which usually held in a meeting between the workgroup and the immediate supervisor in their workplace. In the construction site, Choudhry and Fang⁹² have concluded that toolbox talks was found as one of to the most effective elements for encouraging and facilitating site safety.

Empowerment—Empowerment was mentioned by Nilsen⁹³ as the capability on controlling and mastering over one's own life and situations. From a study by Al-Refaie⁹⁴, its result indicated that one of the elements which significantly affect safety performance in the

Jordanian companies is employee empowerment. According to Abudayyeh *et al.*²⁷, a clear commitment to management can be demonstrated by an empowered individual in placing safety as their own personal goal and responsibility by spreading the sense of safe behaviour and control into other situations in changing the unsafe practices.

Continuous monitoring and improvement—Abudayyeh *et al.*²⁷ stated that management which committed in ensuring safety will continuously improve their safety programs and techniques from monitoring the workers performance and using reliable feedback as a tool for improvement in workplace. In addition, Zeng *et al.*⁷⁶ stated that top management commitment is one of the elements required for adopting a system in the effort on improving the safety management system where it could avoid duplication of effort and reduce the resources input while improving construction safety.

The existence of Safety culture—According to Biggs *et al.*⁴¹, the effort on defining safety culture constructs found to be complicated even for experts within the organisation. Safety culture is “a part of the overall culture of the organisation and is seen as affecting the attitudes and beliefs of members in terms of health and safety performance”⁹⁵. According to Ismail, Baharuddin, Hashim and Ismail⁹⁶, in developing an organisation safety culture, recognizing the significance of senior management as an influential factors by demonstrating their mutual trust and commitment to the Safety Officer and Site Supervisor is crucial. In a project, safety culture becomes obvious once all level of the workforce from the worker to the upper management levels began to put safety on their mind²⁷.

■3.0 ANALYSIS OF MANAGEMENT COMMITMENT TO SAFETY IN OSH LITERATURE

As aforementioned, this paper seeks to provide various MCS elements which mitigate accidents in the construction industry, the frequencies of each cited element and the potential research gap through the utilizing of content analysis on relevant articles.

3.1 The Compilation of MCS Elements and Frequencies

Based on the literature reviews, various MCS element were identified from various researcher^{27,40,92,97,67,38,85,98,18,99,65,100,10,84,11,36,76,101} respective studies.

Afterwards, each element was recorded in frequency based on the researchers total cited as shown in Table 3.

By referring to Table 3, Safety Participation, Allocating Resources, Communication, Continuous monitoring and improvement, Management Support, and Safety Training were identified as the six most widely cited elements by researchers in mitigating accidents.

Table 3 The frequency of MCS elements based on literatures

| Element of management commitment to safety | Number of instances cited in literature |
|--|---|
| Safety Participation | 10 |
| Allocating Resources | 9 |
| Communication | 7 |
| Continuous monitoring and improvement | 7 |
| Management Support | 6 |
| Safety Training | 6 |
| Empowerment | 5 |
| Visibility | 5 |
| The existence of safety culture | 5 |
| Personal Protective Equipment | 4 |
| Positive Attitude towards Safety | 3 |
| Safety Programmes | 3 |
| Motivation Of Workers And Safety Personnel | 3 |
| Accident Investigation | 2 |
| Demonstrate Leadership | 2 |
| Conduct Toolbox Talks | 2 |
| Decision Making | 1 |
| Boundary Spanning | 1 |
| Awareness Creation | 1 |

3.2 The Research Gap Related to MCS in the Construction Industry

In the attempt of identifying gaps in the MCS literatures, it was found that there is much less attention given on MCS research in the construction industry studies and most researchers only focused on certain aspect in OSH such as the causes of accidents^{81,8,92,102-104}, safety culture^{41,105-107} and safety climate¹⁰⁸⁻¹¹¹.

Although MCS in construction appears to be lacking in term of research conducted, related studies conducted can be identified and they only focused on certain areas of elements of MCS. The topics studied were such as role played by first-level supervisors on safety performance¹¹², the Safety4Site program on-site safety management program¹¹³, management's commitment to construction safety²⁷, owner's role in construction safety¹¹⁴, the level of importance on safety by the field personnel and site managers and the level of importance placed on safety during construction engineering⁹⁹, the power bestowed on field personnel to change or improve the company's safety performance¹¹⁵ and the presence and monitoring of dedicated safety personnel in the field⁸⁵. Thus, more comprehensive study is required in considering all aspects of commitment to safety where many studies have shown its impact on safety performances.

Moreover, those studies stated above have involved the management team from different levels such as supervisor, safety and health Officer, manager and senior manager and how their position affects the safety performance. Yet, little related research was done from the views of top management in construction particularly in Malaysia.

Another gap in the research is determining the relevant constructs of MCS due to its definition seems broad and inconsistent in nature as shown below.

- i) The commitment to safety as to the extent of which the upper-level management identifies safety as a core value or guiding principle of the organisation¹¹⁶.
- ii) The extent of which management is perceived to place a high priority on safety and communicate and act on safety issues effectively²².
- iii) Engaging in and maintaining behaviours that help others achieve a goal¹³.
- iv) An assessment of employees' attitudes about management's value of safety rather than of the structural elements of safety provided^{117,118}.

Subsequently, more research is needed to unravel this difficulty on identifying the actual definition and construct of MCS.

4.0 CONCLUSION

All in all, it can be said that MCS plays very important roles in an organization's well-being and prosperity in the construction industry as proven by many studies. However, some employers in the construction sector tend to neglect their responsibilities in ensuring safety at their establishment due to various reasons. Therefore, more study on understanding top management situations and views and how they effect on the occurrences of accidents are required.

Furthermore, it is also revealed that the MCS elements have been used repeatedly and interchangeably based on the literature reviews where 19 MCS element have been identified. Implementing all of the elements is important in reducing accident cases and any problem associated to them. By considering the complex nature of the construction work, the critical elements and their effectiveness are suggested. Many studies have been conducted on safety commitment in specific aspect, it is also suggested that more comprehensive research regarding the cause and effect should be conducted in order to gain more knowledge in mitigating occupational incident at workplace.

In a nutshell, the construction top management must be proactive in demonstrating their commitment in OSH. They also must be sincere in their action and be firm with the decisions that they make regarding safety at the workplace. These can influence the behaviour and action of employees either in contributing toward rewarding benefits or unnecessary losses in the organization.

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