SAFETY MANAGEMENT SYSTEMS IMPLEMENTATION: A STUDY UTILIZING THE GROUNDED THEORY ANALYSIS

Norfaridatul Akmaliah Othman[1], Juhaini Jabar[1], Nur Syazwani Sallehuddin[1], Mohd Fauzi Kamarudin[2]

[1]Faculty of Technology Management and Technopreneurship,
Universiti Teknikal Malaysia Melaka

[2]Centre for Language and Human Development
Universiti Teknikal Malaysia Melaka

Email: norfaridatul@utem.edu.my, juhaini@utem.edu.my,
mohdfauzi@utem.edu.my

ABSTRACT

The objectives of the study were to investigate the issues surrounding the successful and satisfactory delivery of Safety Management Systems (SMS) solely from Malaysian contractors' perspective and to develop a theory related to the reasons for those issues. An inductive approach is used for a study on investigation of Safety Management Systems (SMS) implementation among Malaysian contractors in processing plants. The approach aims at identifying the problems encountered by contractors and sought to develop a theory, to gauge the issues from contractors' perspective and how these issues appear and affect the outcomes of SMS implementation. The issue and underlying problems of SMS implementation were analyzed through in depth semi-structured interviews with 13 respondents. An adapted Grounded Theory analysis, following the original Glaser and Strauss (1967) philosophy, was used to analyze the data extracted from the interviews. Through the use of Grounded Theory approach, the root causes of issues and underlying problems of SMS implementation among Malaysian contractors was uncovered. Subsequently, a theory of problems encountered by contractors was developed.

KEYWORDS**:** *grounded theory analysis; in-depth semi-structured interview; inductive approach; theory development*

1.0 INTRODUCTION

The growth of petrochemical processing plants (hereafter referred to as processing plants) has benefited various industries, especially the construction industry. The construction industry plays a major role in processing plants; as many construction activities are carry out to meet the high demands of development. One important role of the construction industry is to provide civil and mechanical maintenance tasks.

The use of contractors for maintenance tasks in processing plants is necessary to cope with the large scale of work and engineering problems (Mueller *et.al.*, 1996). Contractors play a significant role during maintenance tasks due to the amount of work to be accomplished in a short time (Duffaa & Daya, 2004). Other reasons for using contractors include: experience and professionalism; specialization in certain areas; productivity, cost and efficiency (Duffaa & Daya, 2004; Lenahan, 2006).

Despite its important contribution to processing plant development, the Malaysian construction industry is still saddled with serious safety problems. For instance, there have been 700 negligence cases in the construction industry since 2002, which include high-profile incidents (Basri & Kumar, 2006; The Star, 2006). The construction industry continues to contribute towards the high fatal accident rate in Malaysia (DOSH, 2011; MOHR, 2008; Berita Harian, 2007; Kong, 2001).

This research focuses on the exploration of the issues and problems related to SMS development and implementation faced by Malaysian contractors working in processing plants. The lack of sufficient theoretical understanding of SMS development and its implementation emphasises the requirement for a more grounded approach. This is achieved through the exploration of SMS from the perspective of those involved.

The research is intended to investigate the issues surrounding the successful and satisfactory delivery of SMS solely from Malaysian contractors' perspective and to develop a theory related to the reasons for those issues. The results will assist various parties involved in processing plants of construction projects to eradicate the safety issues.

2.0 SAFETY MANAGEMENT SYSTEMS IN THE CONSTRUCTION INDUSTRY

2.1 Current Problems of SMS in Construction Industry

Past studies have discovered that the successful implementation of SMS can help to prevent accidents in the construction industry (Baxendale & Jones, 2000; Wilson & Koehn, 2000; Tam *et.al.*, 2001; Hinze & Gambatese, 2003). However, the use of SMS reached a plateau. Despite adopting SMS, contractors remain poor in the implementation of safety at worksites. As an organic type of organisation (Wilson, 1989), construction offers a flexible working environment. Construction involves human interaction and complex activity and aligns individual objectives into one process, which is always difficult in practice, especially for large projects. Projects are complex in nature, as they involve technical, procedural, organisational and human elements in an integrated manner (Ruuska & Vartiainen, 2003).

The construction industry consists of various parties such as client/ owner, designer, consultants, general contractor, sub-contractors and suppliers which are known as multi-organization process. Construction is also a multi-stage process as it includes conceptual, design, construction, maintenance, replacement and decommission. The multi-organization and multi-stage processes are also known as Construction Supply Chain (CSC). The CSC has been characterised with fragmentation and poor coordination among project participants for a long time, many of which are inter-organization problems, such as interdependency among contractors and subcontractors, inaccurate information transfer and wrong deliveries of goods and materials which results to sub-standard work performance (Xue *et.al.*, 2007; Vrijhoef & Koskela, 1999). This complexity clearly demands for greater efficiency and effectiveness of SMS towards accident prevention mechanisms.

2.2 SMS in Malaysia

The concept of SMS is relatively new in Malaysia. Although the Occupational Safety and Health Act 1994 (OSHA 1994) is quite comprehensive and has gone through improvements over earlier pieces of legislation, the level of awareness and practicability of such regulations within the construction industry are still generally lower than expected (Rampal & Nizam, 2006). In addition, SMS in Malaysia is still under self-regulation without nationally applied models (Kogi, 2002). Hence, the number of Malaysian companies subscribing to SMS is still small compared to the total number of industries in the country (Thye, 2001). A study by the Malaysian Trade Union Congress (MTUC)

(2001) affirmed that the implementation of safety in Malaysia is poor in the workplace. Furthermore, there are currently no specific guidelines or a master plan for the implementation of SMS programmes to help the construction industry players to improve their performance (CIDB, 2008).

2.3 Implementation of SMS

Industrial accidents happen mainly due to non-compliance of OSHA 1994 by employers (New Straits Times, 2002). However, in the case of contractors working in processing plants, safety is a requirement of the clients. Many clients have introduced various safety approaches to improve the safety performance of contractors (Simon & Piquard, 1991; Ibrahim *et.al.*, 2002). It is compulsory to include a safety plan in the tender documentation during the bidding process (Kong, 2001). However, previous research (Fitts, 1996; Smallwood, 1998; Yule and Mearns, 2004; Abraham *et.al.*, 2004) confirms that contractors adopt SMS just for the sake of the tender requirements and to satisfy the clients during the bidding process. Hence, the implementation of safety is still lacking (Fitts, 1996). According to Husin *et.al.*, (2008), in the context of Malaysia, current SMS practices do have sound features and characteristics, but lacks mission, vision, objectives and awareness due to the over-emphasis on productivity. SMS is under self-regulation and it requires more constructive and practical ideas for implementation (Husin *et.al.*, 2008).

In the case of contractors working in processing plants, apart from the complexity of construction working condition, contractors face a greater risk during maintenance tasks (Kim *et.al.*, 2002). Contractors could be exposed to a number of inevitable hazards: large number of workers, mostly employed by the contractors, who are unfamiliar with the plant in a confined space; the presence of hazardous materials; a large number of tasks performed under high pressure, in all weathers and often all the time (Ahmadun *et.al.*, 2003). The number of workers involved in a processing plant maintenance shutdown can be anywhere between 700 and 3000 at peak time (Ahmadun *et.al.*, 2003).

Due to the hazards and risks present in processing plants, the clients set high safety requirements and effective approaches to monitor and control the safety of contractors (Jannadi & Bu-Khamsin, 2002). However, accidents among contractors still happened (Kong, 2001; Mohd-Salleh, 2002; New Straits Times, 2002; Shaluf & Ahmadun, 2006; Zainudin *et.al.*, 2006). Fatalities and injuries are commonplace among contractors due to the heavy physical activities necessary during

maintenance tasks and the presence of a large number of workers (Hale *et.al.*, 1998; Ahmadun *et.al.*, 2003; Duffaa & Daya, 2004). The number of accidents involving contractors is often more than five times higher than those involving the processing plants' own personnel (as cited in Hale *et.al.*, 1998).

Some important examples of accidents in Malaysian processing plants are the Tiram Kimia Depot chemical explosion (1992), the Shell Bintulu explosion (1997), the Petronas Gas Berhad fire and explosion (2002), the Petronas LNG Complex Bintulu fire incident (2003), the refinery fire in West Malaysia (1999), the Fatty Chemicals methanol blast (2006) and the Petronas LNG Complex Bintulu gas leakage (2009) (Mohd-Salleh, 2002; Shaluf & Ahmadun, 2006; Ismail & Stuart, 2005; Utusan Malaysia online, 2009). Fatalities involving contractors is the worst consequences due to processing plants accidents. Some examples are three fatalities in the Petronas Gas Berhad explosion in 2002 (New Straits Times, 2002; Shaluf & Ahmadun, 2006) and two fatalities in the Fatty Chemicals methanol blasts in 2006.

There are many issues involved in implementing SMS. Failures are still common despite advances in the SMS approach. Little has been written on the views of contractors in processing plants about the issue they have with SMS implementation. Therefore, an investigation of SMS implementation can help to identify the problems encountered by contractors.

3.0 RESEARCH METHODOLOGY

3.1 Introduction

The study uses a qualitative approach. Clearly, there is a need to explore the underlying causes of barriers to SMS implementation from the perspective of Malaysian contractors working in processing plants to find solutions that will influence their actions and enhance the desired implementation behavior. As implementation is such an abstract and complex construct concerned with values, attitudes and behaviors, a qualitative approach (i.e. a research interview) was adopted to elicit the meanings and to facilitate exploration of the key issues related to the research (Charmaz, 2006).

A series of in-depth, semi-structured interviews were set up with Malaysian contractors working in processing plants. They were designed to identify the issues faced by the contractors during the

implementation of SMS. Interviews are an appropriate means of conducting discussions to not only reveal and understand the 'what' and the 'how' but also to place more emphasis on exploring the 'why' (Saunders *et.al.*, 2003). The in-depth, semi-structured interviews may be used to explore and explain the themes that have emerged from the use of questionnaires (Wass & Wells, 1994). The main objective of the in-depth, semi-structured interview in this research is to inform an understanding of why SMS implementation is ineffective among Malaysian contractors working in processing plants.

The target respondents for the interviews were Malaysian contractors working in processing plants. All local contractors are required to register with CIDB in one of seven grades (G1 to G7). The categories reflect the size of the firms, with G7 being the largest and G1 the smallest. The categories are based on the tendering capacity or project cost at which they are qualified to participate, minimum capital available, organisation of resources and level of experience. Through theoretical sampling, the sample of Malaysian contractors in all categories (large, medium and small) of the Malaysian Contractor Industry Development Board (CIDB) registration and which specialise in civil and mechanical engineering for both maintenance services and project shutdown in processing plants were deduced. Theoretical sampling is a fundamental part of the Grounded Theory analysis whereby the researcher determines, chooses and develops the sampling population and data through his/her theoretical ideas and understanding of the phenomenon with respect to the data already gathered and analysed (Corbin & Strauss, 2008). Thus, the developing conceptual understanding by the researcher directs the sampling in directions that lead towards the expansion, refinement and elaboration of conceptual categories. Sampling stops as data becomes saturated. In this study, seven contractors, with the total respondents of thirteen (13) participated in the interviews.

The interview transcripts were analyzed according to the Grounded Theory approach, following recommendations in the Grounded Theory analysis literature (Strauss & Corbin, 1998; Goulding, 2002; Heath & Cowley, 2004). Grounded Theory has a well-defined process of data analysis for qualitative research (Walker & Myrick, 2006). The full transcriptions were analyzed line by line (Strauss & Corbin, 1998; Goulding, 2002; Charmaz, 2006) to identify the full range of possible codes. The codes represent the interviewee and the number of the statement. In order to ensure the robustness of the analysis, data reduction was performed by the researcher independently inspecting the interview notes and transcripts.

3.2 Grounded Theory: Background and the Debate

The Grounded Theory method was developed by two American scholars, Barney G. Glaser and Anselm L. Strauss, during their sociological field investigation of the awareness of dying as a social problem (Glaser & Stauss, 1967). As they constructed their study of dying, they developed more defined and systematic methodological strategies for collecting and analyzing qualitative data which researchers in various disciplines could adopt. Grounded Theory was intended as a methodology for developing theory. It is grounded in data that are systematically gathered and analyzed. Glaser and Strauss's book The Discovery of Grounded Theory, which was published in 1967, first articulated these strategies and advocated developing theories which are eventually grounded in the behaviour, words and actions of those under study (Goulding, 2002). With grounded theory, the researcher must work in the real environments in which the actions take place to analytically relate informants' perspectives to the environments through which they emerge (Goulding, 2002; Douglas, 2004). Hence, the emerging theory from Grounded Theory analysis is valid and reliable and does not require further proving or testing in the real environment because it comes directly from the real environment's data itself (Georgieva & Allan, 2008).

Although Glaser and Strauss thought they were using the same method in Grounded Theory, an ideological split, which culminated in two different approaches to Grounded Theory data analysis, occurred. It happened in 1990 when Strauss co-authored a textbook on Grounded Theory with Juliet Corbin (Strauss & Corbin, 1990). The textbook, entitled Basics of Qualitative Research: Grounded Theory Procedures and Techniques was intended to assist the Grounded Theory beginner by outlining a detailed step-by-step guide on how to use the Grounded Theory method. However, this publication and further revelations were considered by Glaser to be violating the belief of Grounded Theory (Glaser, 1992). His opposition was based on the argument that the proposed guide was too prescriptive and imposed a framework on the data analysis that forced rather than facilitated the emergence of the theory (Glaser, 1992).

According to Heath and Cowley (2004), Glaser had extended Grounded Theory beyond the original text to explain in more detail concepts such as theoretical sampling, theoretical coding and the use of theoretical memos, but it was Strauss and Corbin who focused on developing the analytic techniques and providing guidance to novice researchers.

Strauss and Corbin (1990) claim that Grounded Theory can be used for better understanding on any chosen phenomenon about which little is yet known. Whilst Glaser (1992) remains an adherent to the principles of the seminal Grounded Theory (Glaser & Strauss, 1967), his traditionalism, irrespective of a disdain for the later revisionist approach (Strauss and Corbin, 1990; 1998), assures the qualitative researcher of the values of Grounded Theory in developing answers to socially purposeful questions of what is happening and why.

Glaser and Strauss (1967) originally described two levels of coding, first into as many categories as possible and then the integration of the categories. Strauss and Corbin (1990), on the other hand, describe three levels of coding. Strauss and Corbin (1990) describe the first level procedures as open coding, whilst Glaser (1978) refers to substantive coding. Strauss and Corbin (1990) introduced the second level of coding, called axial coding. Strauss and Corbin's (1990) mentioned that final coding procedure is called selective coding, which is similar to the theoretical coding of Glaser (1978).

Strauss and Corbin (1990) are significantly more prescriptive in specifying the steps to be taken by a researcher in open, axial and selective coding and to follow their process model (identifying codes as causal conditions, phenomenon, context, intervening conditions, action/inaction strategies, consequences) in developing a theoretical framework. The Glaser adherent allows for the central concept to emerge inferentially from the coding process – reflecting key issues or problems as perceived by the actors being studied. Thus, following the Strauss and Corbin approach, the researcher could elect in advance to focus on the observations, interviews and other data gathering on a particular issue, such as management-employee communication. Coding is then oriented around this topic, and a central concept is then sought to represent the interplay of the subjects' and researcher's perceptions of the nature and dimensions of the elected phenomenon. As a critique of Strauss and Corbin's (1990, 1998) revisionist methods, the emergence of conceptual themes may not legitimately freely surface, in which case, arguably, a true ontology would not materialize (Glaser, 1992).

As the researcher is left with a basic choice between the 'Glaserian' and 'Straussian' approach, it is essential to acknowledge the dissimilarity between the two founders of the Grounded Theory method. It is important to recognize the overlapping use of terms in both the 'Glaserian' and 'Straussian' approaches, such as the terms axial and

theoretical coding. Glaser's advocacy is a less specific analytical approach, and Strauss and Corbin's provision has more detailed operational guidelines. The latter offers greater potential assistance to the field researcher, who must nevertheless take particular care to avoid imposing concepts that reflect his own epistemological predilections, rather than those emerging from interaction with the study site, its participants and subsequent data. As mentioned earlier, at the heart of Grounded Theory methodology are three coding procedures, which Strauss and Corbin (1990) refer to as open coding, axial coding and selective coding. The detailed coding procedure is explained in the following sections.

3.2.1 Open Coding

Open coding is the initial stage of the whole theoretical and comparative analysis process and is designed to generate theory within a Grounded Theory framework (Reid, 2006). Open coding occurs at the early stage of the analysis, and the primary goals are to conceptualize and categorize the data. These goals are achieved through two basic analytic procedures: making comparisons and asking questions of the data.

Open coding is the process of breaking down the data into distinct units of meaning (Goulding, 2002). Text in a full transcription of an interview is analyzed line by line in an attempt to identify key words or phrases, which connect the informant's account to the experience under investigation. Using the open coding technique, data is initially reviewed line by line (Strauss & Corbin, 1998) to enable close examination, interpretation and categorization of information (Glaser, 1978).

Pandit (1996) elaborates that open coding refers to that part of analysis which deals with the labeling and categorizing of phenomena indicated by the data. Open coding requires the application of what is referred to as the 'comparative method', that is the asking of questions and the making of comparisons. Data is initially broken down by asking simple questions such as what, where, how, when and how much.

3.2.2 Axial Coding

According to Goulding (2002), axial coding involves a higher level of abstraction and is achieved by specifying relationships and delineating a core category or construct around which the other concepts revolve. Through axial coding, the researcher develops a category by specifying the conditions that gave rise to it, the context in which it is embedded

and the action/interactional strategies, by which it is handled, managed and carried out.

Strauss and Corbin (1998) defines axial coding as: "the process of relating categories to their subcategories, termed 'axial' because coding occurs around the axis of a category, linking categories at the level of properties and dimensions". The purpose of axial coding is to begin the process of reassembling data that was fractured during open coding. Categories are related to their subcategories to form more precise and complete explanations about phenomena. Several basic tasks include the following:

- Laying out the properties of a category and their dimensions, a task that begins during open coding.
- Identifying the variety of conditions, actions/interactions and consequences associated with a phenomenon.
- Relating a category to its subcategories through statements denoting how they are related to each other.
- Looking for clues in the data that denote how major categories might relate to each other.

In conclusion, axial coding puts the data back together in new ways by making connections between a category and its subcategories. Thus axial coding refers to the process of developing main categories and their subcategories (Pandit, 1996).

3.2.3 Selective Coding

Selective coding is the final stage of coding in grounded theory data analysis. It builds upon the foundation of open and axial coding exercises. Strauss and Corbin (1990) define selective coding as: "the process of selecting the central core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development". Selective coding involves the identification of the 'core category' (the central phenomenon that needs to be theorized about) and linking the different categories to the core category using the paradigm model (consisting of conditions, context, strategies and consequences). Often, this integration takes the shape of a process model with the linking of action/interactional sequences. Selective coding involves the integration of the categories that have been developed to form the initial theoretical framework (Pandit, 1996).

Selective coding requires the selection of the focal core, i.e. the central phenomenon that has emerged from the axial coding processes. All other core codes derived from that axial coding process must be related in some way to this focal core code, either directly or indirectly.

3.2.4 The Coding Process

The approach in this study was influenced by recent publications on grounded theory analysis, but it follows as closely as possible the combined descriptions of the methods of both Glaser and Strauss (1967) and Strauss and Corbin (1990).
Grounded theory data analysis involves searching out the concepts behind the actualities by looking for codes, then concepts and finally categories (Allan, 2003). The researcher first translated and transcribed the interview data using the computer software Express Scribe version 3.0, then copied it into a word-processing document. The next step was coding, which involved analysis and sorting of data and is the first step in theory development (Charmaz, 2006). The goal of coding is to fracture the data to aid in the development of theoretical concepts and rearrange it into categories that facilitate the comparison of data within and between these categories (Maxwell, 1996). The researcher looked for recurring patterns of the passages in the document, which applied to the coding scheme, known in the system as connecting them to a 'node'. This coding is regarded as the key process because it represents the first step in the conceptualization of the data.

The codes are then analyzed and those that relate to a common theme are grouped together. This higher order commonality is called a concept (Allan, 2003). Concepts are then grouped and regrouped to find yet higher order commonalities called categories. Categories are the outcome of the whole process (Maxwell, 1996). The comparison provided an avenue to explain the phenomena that exist within the field of research interest. The researcher then embarked upon the process of cutting and pasting each coded statement into a new word-processing document. Each coded statement was placed within a box and grouped according to category. This process is important for revealing the common themes. Connections between the significant themes were investigated in the data. A number of the themes were dropped at earlier stages of data collection when subsequent interviews revealed them to be less theoretically important or part of another theoretical theme. The sifting process continued in tandem with data collection. If theoretical parallels could not be found, the themes were abstracted into generic descriptive labels.

Table 1 summarized the main findings from the data analysis of the semi-structured interviews. The method of presenting the emergent themes in Table 1 was adopted from Sharma and Vredenburgh (1998) and Carruthers et al,. (2006).

Table 1: Main Findings as Categories and Themes

FIRST-ORDER THEMES (Sub-Categories)	SECOND-ORDER THEMES (Categories)	FINAL THEMES (Emerging Themes)
•Reliance on parent company •Tender requirements •Build-up rapport and reputation •Formality purpose •Ignorance of safety matters •Overlooked •Taken for granted/complacency •Showing off and reputation •Playful and negligent •Act for superior •Short-cut behaviour •Narrow-minded, shy and sensitive (courteous approach to advise or warn the workers)	•Organisational dependency •Management commitment and participation •Individual involvement and behaviour	Cultural dimensions
•Safety resources due to size of company •Safety resources based on size and type of project •Safety budget is upon request from client •Merge safety allocation with other budgets •No specific allocation for safety •Reluctant to invest in safety due to high costs (equipment, training, recruitment) •Perception that "safety is costly" •Reliance on inexperienced temporary workers •Insufficient safety personnel •2-in-1 task responsibilities •Unequal task delegation •Task differences •Reporting and documentation workload •Multi-layered structure •Flexible structure •Lack of control	•Limited resources •Indirect safety allocation •Safety is costly •Inappropriate personnel •Role overload •Co-ordination slack •Structural complexity	Resource constriction
•Variations in safety prerequisites according to client •Documentation upon clients' request •Diversity of safety qualifications (training) •Various safety equipment specified by client •Improper equipment •Double standard on safety regulation and guidelines •Policy keeps on changing •Continuous changing work locations •Unfamiliar working conditions •Safety priority at high risk workplaces •Safety is heavily influenced by weather factors	•Task differences •Inconsistent requirements •Time constraints	Working conditions
•Bureaucracy and time consuming to follow safety procedures •Tight schedule to meet project deadlines •Performance over safety (safety is the last thing to consider)		
•Inconsistent safety meetings •Attend safety meetings handled by client only •Safety meeting is handle when problems occur •Merge safety meetings with other meetings •Lack of themed campaign and safety signage •Safety signage by clients is sufficient	•Disregard safety meetings •Inadequate themed campaigns and safety signage	Communication issues
•Safety training is provided to permanent workers •Safety training is designed for the high hierarchical level of management •Safety training is highly dependent on clients	•Safety training to specific personnel •Clients' safety induction	Training issues

The emerging themes in Table 1 were re-organized using FreeMind software version 0.8.0 to build up the connections between the significant themes and to categorize each theme into broad themes. The following sections address the broad themes in detail.

4.0 FINDING AND DISCUSSION

The findings of this study appear to show that many obstacles encountered by contractors during SMS implementation are interlinked, including cultural factors, working conditions and the organizational process. These factors have formed the underlying root causes of ineffective SMS implementation: the misperception of safety responsibility. The misperception of safety responsibilities occurs by the parties involved in the construction supply chain. However, this study explains only relationship between clients and contractors, clients and contract workers and contractor and contract workers. Based on the research findings, the barriers to effective SMS implementation can be divided into external factors (clients) and internal factors (contractors and contract workers). Several distinct misperceptions of safety responsibility between clients, contractors and contract workers emerged from these barriers.

4.1 Reliance Culture of Safety Management Systems

The results of the interviews indicated that a reliance culture exist between contractors and client, and between contractors and parents company/headquarters. Generally, SMS policy and procedure, which was drawn by the parents company/headquarters was included in the tender documents as a standard image of company's safety implementation. As safety performance has already been taken into consideration prior to contract approval, contractors are seen to disregard safety measures in order to gain contract approval.

Subsequently, contractors rely on headquarters in organizing the safety measures to be utilized. As a result, contractors are in a vulnerable situation, as they need to work in environment, location and condition that they are not familiar with. To familiarize with the in-house safety requirements set by headquarters, contractors are required to collaborate with clients. However, the different levels of responsibilities between contractors and clients in the alliance have led to misperceptions in the process of implementing SMS. The reliance culture leaves the contractor in a vulnerable position due to different environment, location and condition between the entities.

4.2 The Uncertainty of Organic Types of Organisation

The implementation of SMS is highly influenced by the company's external environment such as the uncontrollable risk and uncertainty that are easily overlooked by contractors in a processing plant. Safety requirements and standards will vary based on client's requirements such as work progress, datelines, and schedule. Consequently, safety enforcement is not standardized for contractors and clients when profit is placed as a higher priority compared to safety.

As contractors work under pressure to complete the task in a specified period, this study reveals the bureaucracy of safety procedures, which leads to ineffective SMS implementation, for example, the procedures for bringing in equipment; therefore contractors choose to take short cuts by using inappropriate equipment for the job.

Another issue, which relates to the working conditions, is the physical environment. In this case, the physical environment refers to the geographical location and climate of the workplace. Santos-Reyes and Beard (2008; 2002) stated that the physical environment might affect some aspects of SMS. It is common that contractors will frequently change their working location, and therefore the working conditions also change (Laukkanen, 1999). Safety requirements become more stringent and more demanding according to the project and client. SMS implementation becomes tougher due to this type of physical environment.

4.3 Disintegration and Inconsistency of Organisational Process

Organising is critical to ensure the effectiveness of SMS implementation and has a significant influence upon it (Fitts, 1996; Santos-Reyes & Beard, 2002; Rundmo et al., 1998; Basso et al., 2004; McDonald et al., 2000). Therefore, the development of safety department is crucial to cater safety issues in a company. However, contractors reluctant to do that as it can reduce the budget.

The main concern of a contractor is how to save money and reduce costs. Thus safety is usually considered a secondary priority in the company's plans. In this study, the interviewees' views indicate that it is common practice in Malaysia to discount safety purposely to win the tender. The clients who demand the lowest contract costs have influenced this scenario. As such, the contractors search for lower quality supplies and neglect safety issues. It is not surprising to find that the majority of contractors in this study do not allow for safety

costs in their tenders. This seems to suggest that these contractors find it difficult to implement the most effective safety during the construction phase of their projects.

The SMS implementation was also affected according to project size and size of company. Safety attention is higher on bigger projects compare to small projects. For a small size of company, financial constrain is common which led to hiring temporary workers. This condition contributed to poor safety training and lack of qualified taskforce.

5.0 CONCLUSION

From a theoretical standpoint, the development of empirical research in SMS has lagged far behind the fast growing acceptance of SMS as a management philosophy for improving organisational effectiveness. The problem is even more acute outside the developed world where knowledge of SMS is almost non-existent. The research described in this study has attempted to bridge the gap between the existing theories and knowledge and the approaches required for increased effectiveness of SMS implementation in a developing country like Malaysia.

The study therefore investigated the root causes of ineffective SMS implementation from the perspective of those involved, providing a rich, grounded understanding of some of the key elements of SMS implementation and how they are experienced in the Malaysian context.

The results indicate that misperception of safety responsibility issues has a strong influence on contractors' SMS implementation. This finding is an interesting one, as previous studies of SMS give little or no attention to this issue. Addressing this issue is essential to create awareness by the parties involved to improve SMS implementation.

This research has contributed to furthering the understanding of the main factors influencing safety implementation by Malaysian contractors working in processing plants. It has identified factors that are peculiar to, or exacerbated by, the internal and external environment of the companies. Factors such as financial constrictions, cultural dimensions and working conditions are prominent influences.

For future research, it is recommended that research in the area of SMS may be done using the case study framework design focusing on different contractors such as multi-national and international

companies. The result may shed light towards a greater comprehension of SMS practices in different context. Furthermore, a research on the implementation of SMS policies in the Malaysian context may prove advantages or beneficial for researchers and practitioners.

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