

CHAPTER 4

RESULT &

DISCUSSION

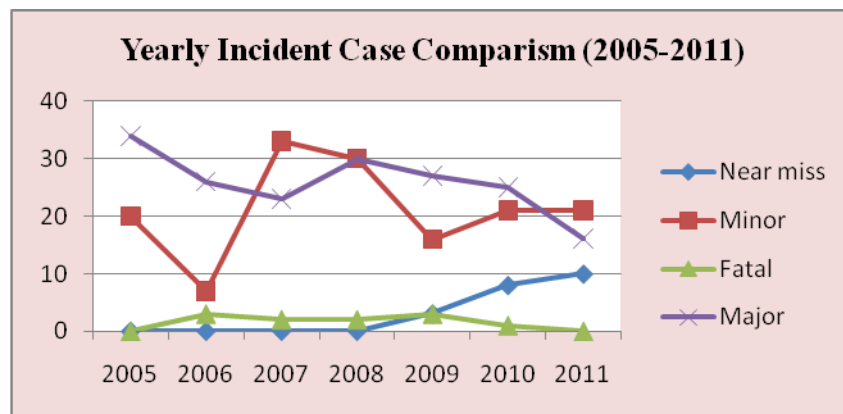
4.1 ESH Situation towards Accident Minimization

For many decades, most organizations have focused on quality to ensure their survival, but in recent years, the trend has shifted to include OSH as a determinant of an organization's competitiveness (LaMontagne *et al.*, 2004). The greatest problem in safety is the difficulty of measuring an organization's OSH performance (Petersen, 2000). Previously, numbers of accidents were the primary means of evaluating the effectiveness of a Company's safety program. Major disaster such as Chernobyl has shown that safety management is important especially in high reliability industries (Fleming & Lardner, 1999).

By the totals of 1650 employees, this Company also committed to take appropriate measures as required and wherever practical. Lin and Mills (2001) survey on the findings stated that safety performance was influenced by size of the company and management and also employees' commitment to safety and health. Size of the company plays an important role in achieving a high level of safety performance. Previous research showed that smaller companies have poorer standards compared to big companies (Lin & Mills, 2001).

The utmost importance at Company in preventing industrial accidents and occupational diseases is the Safe Working Measures Manual (Appendix 21) which includes the procedures of (1) Electrical safety (2) Forklift, tow and reach truck safety (3) Oxy- cutting and Welding safety (4) Entry into confined space (5) Laboratory safety (6) Office safety (7) Lifting and Carrying. This requirement was done to fulfill the ***Regulation on Act 514 (OSHA) 1994, Part VIII; and Section 32; Notification of accidents, dangerous occurrence, occupational poisoning, occupational diseases, and inquiry*** (Appendix 1).

According to Laws of Malaysia (2000), the types of incidents are divided into four categories; (1) Near Miss (2) Accident (3) Dangerous Occurrence and (4) Occupational Poisoning / Disease. As proven on systematic documentations, detail Company' Reports were shown in Appendix Section; (1) Near Miss Report Status Year 2011- Appendix 22 (2) Accident Report Status Year 2011- Appendix 23 and (3) Dangerous Occurrence and Occupational Poisoning/ Disease Report Status Year 2011- Appendix 24. The Company' Notification on Accident and Dangerous Occurrence was stated in Appendix 25.



(SOURCE: Based on Company Data, ESH Department)

Figure 4.1: Yearly Incident Case Compares

Figure 4.1 above show us the Company' Yearly Incident Case Compares, from Year 2005 until Year 2011 which includes the near miss cases happened, minor, fatal and major cases that reported to ESH Department. Further details on numbers of person involved in these cases are shown in Table 4.1 below.

Table 4.1: Detail Numbers of Person Involved

	2005	2006	2007	2008	2009	2010	2011
Near miss	0	0	0	0	3	8	10
Minor	20	7	33	30	16	21	21
Fatal	0	3	2	2	3	1	0
Major	34	26	23	30	27	25	16

(SOURCE: Based on Company' Data, ESH Department)

This study focuses on the data of cases happened in Year 2009, 2010 and 2011. Based on data in Figure 4.1 and Table 4.1, the near miss cases were increased from 3 cases in Year 2009, to 10 cases in Year 2011. The minor cases reported show the increasing number of cases from 16 in Year 2009, to 21 cases in Year 2010, and remains 21 cases in Year 2011. The fatal cases show the decreased number from 3 cases in Year 2009, to 1 case in Year 2010, but no cases reported in Year 2011. Since the implementation of OSHMS in the Year 2008, the fatal and major cases shows the reduction of cases reported, from 27 cases in Year 2009 to 25 cases in Year 2010 and 16 cases in Year 2011.

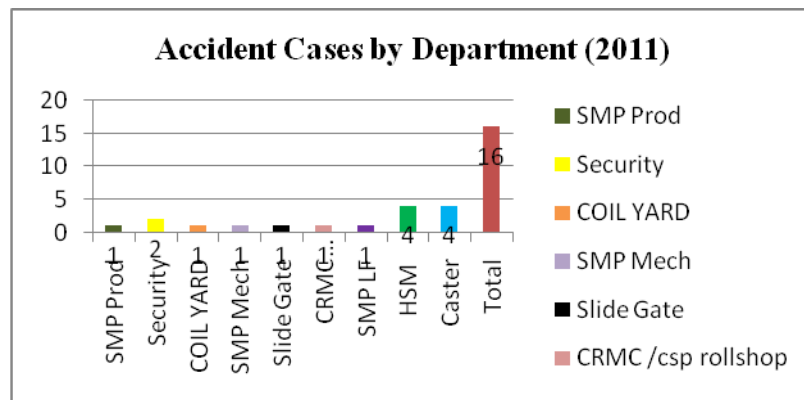


Figure 4.2: Accident Cases by Department in 2011

Based on Figure 4.2, there is one accident case reported in these departments; SMP Production, Cold Yard, SMP Mech, Slide Gate and at CRMC Department. The Security Department has two cases reported. However, the HSM and Caster Department have four accident cases reported. The HSM process was discussed in Sec. 3.9.3, while the TSC Caster was shown in Figure 3.15. Both of these departments were involved in hot and danger areas that may effect in high rate of accident cases happened. This hot area could affect employees' bodies, which could cause the heat stress to body (This topic was discussed in detail in Section 4.3.4- Heat Stress Management). It has been found that around 70% of accidents could be prevented by improved management (HSE, 1988).

4.1.1 Factors Contribute to Accident

The findings from interview with the management show that, the employees' attitude and behaviours were the main factors that contribute to accident happened. The poor attitude of management towards OSH has been considered as the most important underlying factor for poor accident records (Coyle, Sleeman & Adams, 1995). In the factory, environmental factors such as temperature, lighting and ventilation can have a direct impact on health and physical factors in the workplace can lead to common types of accidents. It can be described as lack of ventilation and PPE, inappropriate lighting, excessive noise, and unsuitable furniture, insufficient safety measures during poor emergencies designed workstations.

In addition, Blegen, Pepper and Rosse (2005) indicated that previous studies have identified the following factors as influencing employees' injury: (1) Supervisors' attitudes, actions, expectations and communication (2) Supervisors' tasks that include safety (3) Senior management and employees' involvement in safety issues (4) An organizations commitment to safety and willingness to solve safety problems, and (5) Attitude and behaviour of employees.

Since the introduction of domino theory of accident causation (Heinrich, 1969), accidents have not been only viewed as a consequence of unsafe operative actions and unsafe site conditions but further seen as a consequence of lack of management control. Research in the last decade shows that management and organizational failures are often precursors of accidents (Reason, 1990; Groeneweg, 1994).

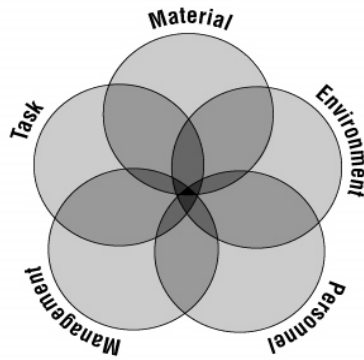


Figure 4.3: Accident Causation by CCOSH

(Source: <http://www.ccohs.ca/oshanswers/hsprograms/investig.html/16/11/12>)

Many models of accidents causation have been proposed today that possible causes in each category can be investigated, that range from Heinrich's domino theory to sophisticated Management Oversight and Risk Tree (MORT). The causes of an accident could also be look in Accident Causation Models (Figure 4.3) that attempt to illustrate causes comes from (1) task (2) material (3) environment (4) personnel and (5) management.

In the Analysis of Root Causes Tracking Model (ARCTM) was developed by Abdelhamid and Everett (2000), possible errors stimulated by the designers or clients are not recognized as possible causal factors. This may result from lack of understanding as to how these participants could share their attempts in promoting safety. Based on research carried out by the European Foundation for Improvement of living and working conditions, which concluded, that site fatalities (Smallwood, 1998): (a) 35% were caused by falls, which could have been reduced through design decisions; (b) 28% were due to the simultaneous performance of incompatible activities, and; (c) 37% were due to the management of production.

4.1.2 The Theory of Accident Causations

There are many theories about accident causation but one of the most simple and easy theory is the Domino Theory. This theory has been developed in 1930's by a man called Heinrich (1969) and has been modified by several others including Bird in Year 1974, and Adam in Year 1976. Figure 4.4 below shows the dominoes in Adam's Dominoes Sequence 1 which represents the elements that contribute to the injury resulting from an accident.

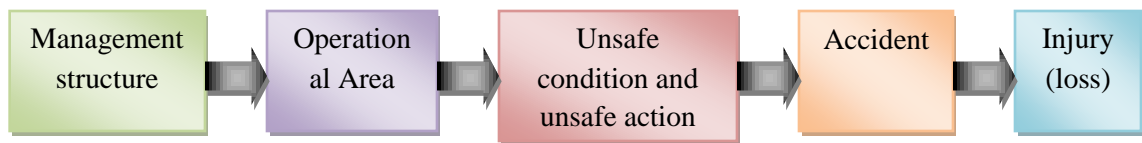


Figure 4.4: Adam's Dominoes Sequence 1

Basically, the source of an accident is at the management level. For example, lack of clear safety policy, and this might trigger choosing incompetent contractor who does not care about safety resulting in dangerous operation. The unsafe action or operation will result in accidents to happen and employees to suffer. Another famous theory is The Failure Initiation Theory by Whittington *et al.*, (1992). This theory addresses deficient policy in the top of organizational level, suggesting that it stimulates failures in the lower levels of organization, including in the site and operational levels.

Figure 4.5 below suggests that there are four levels which failures could occur. In this theory of Adam's Dominoes Sequence 2, the failures at higher level will increase the probability of failures at the lower of the company's policy which will increase the probability of failures at the project level.



Figure 4.5: Adam's Dominoes Sequence 2

Examples of failures at this level are inadequate training policy or poor methods of procurement. At this project level, the failures are; lack of planning, poor work schedule or choice of inappropriate some methods. At the site management level, failures could be poor communication, lack of supervision or failure to adequately segregate work. At individual level, failures can be failure to comply with an agreed method of work.

An excerpt from one country reads: “Every employer shall ensure the adequate direction and instruction of employees in the safe performance of their duties. Every supervisor shall be responsible for the proper instruction of employees under his direction or control and for ensuring that the work is performed without undue risk.” (Heath, 1982(a)).

4.1.3 Accidents Reduction and Other Benefits

Apart from that, commitment of management is also important in developing positive safety behavioural aspects amongst employees. Employees will be less safety conscious and willing to take more risks to get the work completed if the management does not support the safety process (Borstorff & Lowe, 2010). Mr. Mohd Zain b. Muhammad, Company's Safety Health Officer stated during interview process, where the Company has implemented two major programmes namely the Principles of Accident Prevention; (1) Identifications of Hazard, Risk Assessment and Risk Control (HIRARC) (2) OSH promotion, communication and encourage safe attitude.

In assisting the prevention from accidents on safety and health in workplace, the Company makes available a great variety of PPE and well-being of its employees. They also have identified and provided appropriate PPE offers in adequating the protection without incurring unnecessary inconvenience. A prior study by Smith *et al.*, (1978) noted that employees' perception of management's action to safety had resulted in accident reduction (as cited in Yule, Flin & Murdy, 2007).

According to Mr. Sumarlan Sinang, Company's ESH Executive, the criteria for an effective accident preventions program at this Company are; (1) Management and employees must be cooperative (2) Top management must take the lead (3) There must be a definite and known safety policy (4) The organization and resources to implement policy (5) Applied the best available knowledge and methods. Koh (1995) in Feldman and Everly (1985) found that high management commitment was the significant factor for low injury rates at workplaces.

As explained in Office of Technology Assessment (OTA) (1985) report on preventing illness and injury in the workplace, the distinction between employee training and education programs is often blurred and depending on the role that the employee is expected to assume in the process. “The narrower the role, the more the instruction is training; the broader the role, the more the instruction is education” (OTA, 1985). The U.S. was the lone country providing central government funding to support job safety and health training programmes. It was assumed by employers, insurance companies, private safety and health organizations. But, Heath found that the evidence in these countries shows that training was an effective countermeasure in reducing worksite injury and illness ranged from poor to nonexistent (Heath, 1982(b)).

However, in line with Huang *et al.*, (2006) and Seo *et al.*, (2004) have indicated that management’s commitment, the role of the supervisor and safety training were some significant factors in preventing accidents from occurred in the workplace. The employers have provided the best solutions in controlling the hazard and reducing the number of accident happened. This was discussed in details on the Sections of this Chapter; Sec.4.2; Management Leadership and Organizational Commitment, Sec.4.3; HIRARC and Sec.4.4; Workplace Accident Preventions.

One report in assessing an employee’s participation approach to hazard control at a worksite (Lin & Cohen, 1983) found the overall effort to be successful but at the same time took note of some gaps of employee’s knowledge for which added instruction would have been of benefit. Previous research has suggested that management’s commitment to safety is a significant determinant of employees’ involvement (O’Toole, 2002).

As conclusion, employees' perception of management's action to safety can result in accident reduction. Besides, as indicated by HSE (2002b), many aspects of employees' safety behaviour can be influenced by management priority in safety that includes: (1) The success of safety initiatives; (2) The reporting of near-miss occurrences, incidents and accidents; (3) Employees working safely; (4) Employees taking work related risks; (5) Influencing production pressures; (6) Implementing safety behavior and health interventions; (7) The effectiveness and credibility of safety officers; (8) The effectiveness and credibility of safety committees.

As summarized, workplace accident preventions have given a number of benefits to both employer and employees. Prior studies also demonstrated a reduction in illness/ injury incidence, lowered lost-time frequency, and less compensation in companies which implemented an OHSMS (Bottani, Monica & Vignali, 2009; Robson *et al.*, 2007). In sum, although "OSHSM has evolved internationally as the major strategy to reduce serious social and economic problems of ill-health at work" (Gallagher, Underhill & Rimmer, 2001), yet there is insufficient evidence in the empirical research on the effectiveness of the implementation of OSHMS. However, there are studies which focusing on OSHMS but they concentrate on the success of safety and health outcomes and lack of study which is directly neither investigated the effectiveness of the systems nor examined the support and barriers of implementing an OSHMS.