A Review of Major Industrial Accidents in Malaysia

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***Abstract*— The occurrence of industrial accidents in Malaysia are increased in parallel to the growth of the industries. Industrial accidents occur for a number of reasons. It may results in major injuries or even in some cases, death. The main objective of this study is to review of the past industrial accidents in Malaysia. This is done by defining the meaning of industrial accidents and analyzing the causes and the types of the accidents. The data from Department of Occupational Safety and Health (DOSH) and Social Security Organization (SOCSO) were collected and were examined on the frequencies of the industrial accidents in Malaysia. Statistics reported by the National Institute of Occupational Safety and Health (NIOSH) and Construction Industry Development Board (CIDB) were also been reviewed. The findings of this study showed that majority of the accident cases reported in Malaysia are industrial accidents. This numbers came from all sectors of the industries. Existing records indicated that the present accidents rate in the industry is still very much adverse and below expectation. This paper further examined the relationship between the accidents rate in Malaysia with those in other countries such as the United States of America and the United Kingdom. The findings showed that the trend are relatively similar but the difference are in the total numbers of cases between them. Based on the findings, it can be concluded that there are still works to be done in order to overcome the numbers of industrial accidents in Malaysia. All parties must have the responsibilities to prevent accidents by adapting to the health and safety practices in the workplace.**

***Keywords*—** Accident database; Industrial accidents; Industrial hazards; Occupational safety; Past accident analysis

I. INTRODUCTION

An accident is an unexpected event which is neither designed nor anticipated in the course of employment. In other word, an accident is an uncontrolled event in which a reaction of an object, a substance, a person or a radiation can cause a personal injury. On the other hand, an industrial accident is an unexpected or sudden occurrence in the industry which disrupt the orderly progress of the work. Industrial accidents can be classified into a number of sectors. Each of those sectors contributed to the number of accidents recorded every year. The sectors are as follows:

i. Manufacturing
ii. Mining and quarrying
iii. Construction
iv. Agriculture, Forestry, Logging and Fishery
v. Utility
vi. Transport, Storage and Communication
vii. Wholesale and Retail Trade
viii. Hotel and Restaurant
ix. Financial, Insurance, Real estate and business services
x. Public Services and Statutory Bodies

Accidents can be divided into a few types. It can be classified according to its severity and degree of injury (Vince, Sargent, Ramsden, & Moore, 2007). Therefore accidents can be divided into major accident and minor accident. A major accident is an unexpected, sudden occurrence including, in particular, a major emission, fire or explosion, resulting from abnormal developments in the course of an industrial activity, leading to a serious danger to workers, the public or the environment, whether immediate or delayed, inside or outside the installation and involving one or more hazardous substances (Barell & Chavalitnitikul, 1991). The figure 1 below shows the type of accidents that can occur.

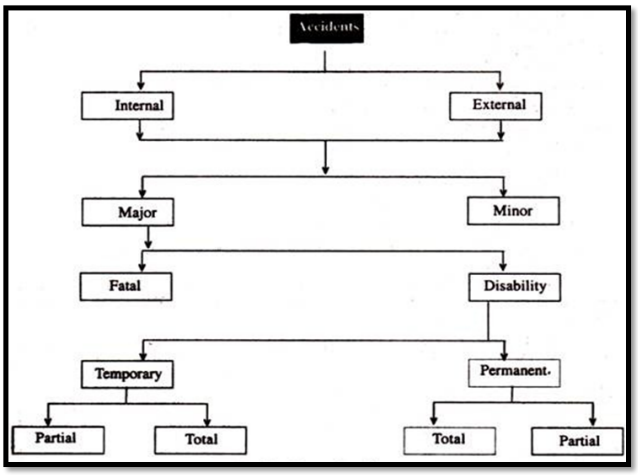

Fig 1: Type of accident tree

There are many causes to an accident which can be classified into several categories (Shaluf, Ahmadun, & Mustapha, 2003). One of it is unsafe conditions. This cause is work related and are said to be the biggest cause of accidents. This causes are also known as technical causes as they are associated with faulty and defective tools, equipment, machineries and also materials.

The next cause of an accident is unsafe acts which is workers related. This is due to certain acts on the part of workers which contributed to an industrial accidents. These acts may be the result of lack of knowledge or skill on the part of the worker, certain bodily defects and wrong attitude.

Besides that, another causes of accidents arise out of unsafe situational and climatic conditions at the workplace. This may include bad working conditions and unhealthy environment such as excessive noise, excessive glare, dust and fume, humid condition and very high temperature.

Year after year, we have been served with abundant numbers of reported accident cases throughout the country. This accidents has caused thousands of casualties and sometime could be fatal. This cases are spread among all the industries in Malaysia. A study has discovered that overexertion is the highest recorded type of accident followed by falling objects, falling from height, equipment-causes injury and so on (Pertulla, Merjama, Kiurula, & Laitinen, 2003) .

For example, the construction industry which is one of the leading industry when it comes to the number of accidents recorded. Top five categories of fatalities in the construction industry namely falls, electrocutions, vehicle rollover, personnel run over by vehicle and excavation cave-ins (Asfahl, 2004). There are many studies conducted that identify the main accident types within the construction industry ranging from falls, falling objects and buried under the excavated sand or soil in the context of Malaysia (Abang Abdullah & Chai Mei Wern, 2011). Table 1 below shows agents of accidents in Malaysian construction industry from year 2000-2009 (Chong & Low, 2015).

Table 1: Agents of accident

Agent	Reported Cases
Working Environment	
-Floor and wall opening	6774
-Stairs	6036
-Confined space	4296
-Total	17106
Transport and lifting equipment	
-Truck	11622
-Tower crane	653
-Lift	295
-Total	12570
Other Equipment	
-Ladder and mobile ramp	3368
-Scaffolding	819
-Total	4205
Machines	
-Earth moving machines, excavating and scraping machines	682

There are many causes that could lead to an accident. After examining the backgrounds and agents of accidents, a factual statistical data on causes of accidents were investigated. According to Social Security Society (SOCSO) data, causes of accidents can be shown in the table 2 below. The reported cases are from 2005 to 2009.

Table 2: Causes of accident

Causes	Reported Cases
Stepping on, striking against or struck by object	8997
Falls	5209
Other types of accidents	2450
Caught in between objects	1855
Overexertion or strenuous movements	684

From table 2, we can see that stepping on, striking against or struck by objects happens to be the most reported cases of accidents. This happens when moving construction equipment strikes or run over workers.

Another critical cause of accidents in Malaysia is falls. From the table, an average of 1042 cases of falls are recorded annually.

Next in the group of accidents causes is other non-classified types of accidents with a total number of 2450 cases or an average of 490 cases reported yearly. Some of the accidents are structure collapse, electrocution, fire, drowning, explosion and toxification.

Fourth in the group is accidents involving being in between objects. A total of 1855 cases were reported from 2005 to 2009 with approximately 371 cases per year. Workers are usually reported to be buried inside a hole or trench due to collapse of soil. Finally, the table shows that overexertion or strenuous movements recorded 137 cases on average. Overexertion or strenuous movements are another type of accidents in industry. A compressed work program and delays in a project schedule are the reasons of accidents (Chong & Low, 2015).

Since our independence in 1957, Malaysia has developed and progressed at a remarkable pace. Our country has transformed from an agrarian to an industrialized nation. In parallel to the industrialization, came along disasters related with the development and technology apparently. Malaysia has experienced various magnitudes of disasters ranging from biological, structural collapse, fires and explosions, landslides and meteorological incidents (Mat Said & Ahmadun, 2007).

From various industrial accidents that has happened in Malaysia before, there are a few which are big enough to be considered as landmark accidents. One of an example of the landmark accidents in Malaysia is the Bright Sparklers Firework Disaster in 1991. Malaysia experienced a tragedy due to manufacturing of fireworks for the first time when the Bright Sparklers Fireworks Factory exploded in 1991.

The Bright Sparklers Fireworks Factory is a factory that manufactured various types of fireworks. It is situated at Sungai Buloh, Selangor Darul Ehsan. On a fateful Tuesday of May 7, 1991 when the factory burst into a thunderball, killing 26 people, injuring 103 and causing an estimated damage of more than RM1 million in residential property.

The investigation believed that fire sparks and raging casing fragments got out of controlled and flew everywhere, falling on the chemicals, causing a fire. This is due to a new product that was being tested close to chemicals which had been dried. The fire caused a chain of explosion throughout the factory. The entire factory was destroyed by the fire and explosions.

Another noticeable disaster is the Choon Hong III Ship Explosion in Port Klang, Selangor. This accident was considered as a man-made disaster involving a chemical supply ship and terminal storage of chemicals of the Tiram Kimia Sdn Bhd. Tiram Kimia Sdn Bhd (TKSB) is a subsidiary company of Shell Malaysia Berhad. Located in Port Klang. It is a chemical storage depot equipped with a jetty to handle various types of petrochemical transportation such as importation, storage and distribution.

In industry, man-made disasters sometime happened when independent major hazard installations compliments each other. For example, chemical cargo ship and storage areas, floating storage tank at offshore areas and cargo ships, supply vessels and platforms and many more.

In this accident, it was said that the main cause of it is a faulty unloading pump which then causes a chain of event leading to the incident itself. On the morning of June 20th 1992, the M.T. Choon Hong III ship was anchored at the TKSB terminal to unload xylene chemicals from the ship. Due to the contaminated pipeline because of the usage of spare pump, the chemicals has been transferred 200-liter capacity drums which then stored on the ship and at the jetty.

At approximately 9.00 p.m., a fire and explosion ignited on board the ship. The terminal yard was showered with flying burning objects, fragments and burning drums from the ship. As a result from that, the fire spread into other parts of the terminal. The fire was believed to be burning for 18 hours.

As a result from the fire and explosion, the M.T Choon Hong III ship was completely damaged which then sank to the floor of the Klang River. The disaster has also caused 13 fatalities and a number of injuries

Malaysia also have a fair share of accidents involving explosion before. There have been a few noticeable explosion reported in the past before. One of it was the Shell SMDS Fire and Explosion that happened in Bintulu, Sarawak.

On 25 December 1997, at approximately 10.50 p.m., Shell Middle Distillate Synthesis (SMDS) Plant in Bintulu, Sarawak was rocked by a huge explosion. The explosion has been said to occur at the air separation unit (ASU) in the plant. Although the investigation was in difficulties as many crucial components were initially buried under tons of rubble. But the team managed to find the cause of the explosion.

It was said that the particles which occurred during the prolonged haze period that blanketed Borneo at that time, had entered and accumulated in the plant's Air Separation Unit (ASU).

Due to the force of the explosion, a blast damage could be felt to a distance of 5 km. Lucky only 12 people were injured and none of them were serious. Although the ASU were completely destroyed in the explosion. The explosion also did severe damage to the

surrounding facilities in the plant.

Valuable lessons were learned from past disasters and they had greatly influenced the evolution of safety and disaster management in the country. Some of these were land-marked disasters where various regulations, acts, and laws were amended or introduced, and formation of specialized functional bodies.

Department of Occupational Safety and Health of Malaysia are very concerned about the well-being of the workers in the country. Therefore they have enforced a few laws in order to contain the risk of workers being injured or even died in the working industries. The laws are Factories & Machineries Act (FMA), 1967, Occupational Safety and Health Act (OSHA), 1994 and also Petroleum (Safety Measures) Act, 1984.

Factories and Machineries Act, FMA 1967 is an act to provide for the control of factories with respect to matters relating to the safety, health and welfare or persons therein, the registration and inspection of machinery and for matters connected therewith (Yusoff, 2015).

On the other hand, Occupational Safety and Health Act, OSHA 1994 is a law gazette in February 1994. This act cover nearly all sectors of the industries except for person working on board ships and the armed forces. It provides wide coverage of protection which is 90% of workforce.

This legislation have a certain hierarchy that need to be follow. This include the act itself, regulations, orders, code of practices and also the guidelines. The figure below shows the hierarchy flow for both FMA 1967 and OSHA 1994.

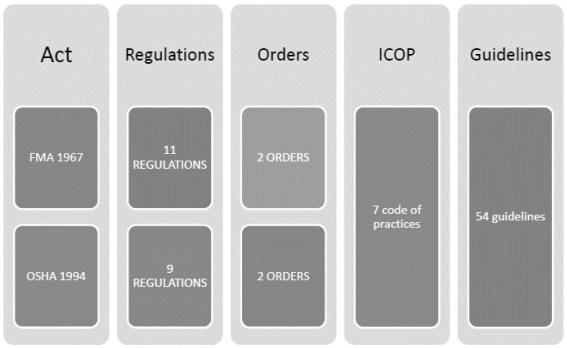

Fig 2: Hierarchy of legislation

II. METHODOLOGY

A. Materials

i. Study materials

The materials used in this study was mainly articles from various journals. The journals used are from various departments such as chemical engineering, safety and even business. Some examples of the journals used are Journal of Loss Prevention in the Process Industries, International Review of Chemical Engineering, International Conference on E-business, Management and Economics, Journal of Hazardous Materials and many more.

Besides that, newspaper articles are also being used as materials in this study. The newspaper used ranging from local newspapers to international newspapers. The newspapers usually reported the news of an accident that happened or even lesson learnt from any accidents.

On the other hand, books and reports also provided information as materials for this study. The books and reports give information or knowledge on certain things other materials cannot give. For example, definitions and procedures.

ii. Data analyzed

During this study, a large number of data were analyzed from various sources from journals, reports and even from the world-wide-web. The data consists of statistics, procedures and historical data of past accidents.

Some of the sources for the data was from a local departments such as the Department of Safety and Health (DOSH), Social Security Society (SOCSO) and Ministry of Human Resources.
There are also data collected from international agencies. For examples, The Department of Safety and Health (DOSH) of the United States of America, The United Nation Environmental Program (UNEP), The ARIA (analysis, research and information on accidents) Database and many more.

B. Method

i. Comprehensive reading

Prior to this study being conducted, materials were gathered from various sources regarding the topic chosen. This materials consists from journals, books, reports and many more. The materials are being collected before being proceed to the study itself.

To conduct this study, comprehensive readings was done to gather information and knowledge regarding the topic chosen. Constant comparison of content are being held between the materials to find the most accurate information for the study.

After hours of comprehensive readings and materials comparison, the final information are being written down as our case studies. The information are being separated by the chapters choses prior the study being conducted.

ii. Analysis of data

During the study, all of the data gathered are being thoroughly analyzed to ensure all the data are accurate. The sources of the data need to viable and not classified. The data are also sorted out carefully to ease up the study.

The data gathered are then being tabulated into tables of figures. Charts are also being used to make all the data easier to understand.

III. RESULTS AND DISCUSSION

A. The relative frequencies of accidents reported in Malaysia

Accidents occur years after years whether we like it or not. There are many types of accidents that happen out there. For this research, the accidents are classified as industrial accidents and non-industrial accidents.

According to SOCSO, via their annual reports from 2005 to 2015, there are more than 50,000 total number of accident cases being reported annually. These numbers are for both industrial and non-industrial accidents.

According to the figure 3 below, it shows the frequencies of the accidents reported every single year in a span of ten years. The table then shows the number of cases separated into industrial and non-industrial cases.

According to the figure 3, 60 to 70 percent of the total number of accidents reported every year are industrial accidents. This shows that the majority of accidents that happen in Malaysia are from the industry.

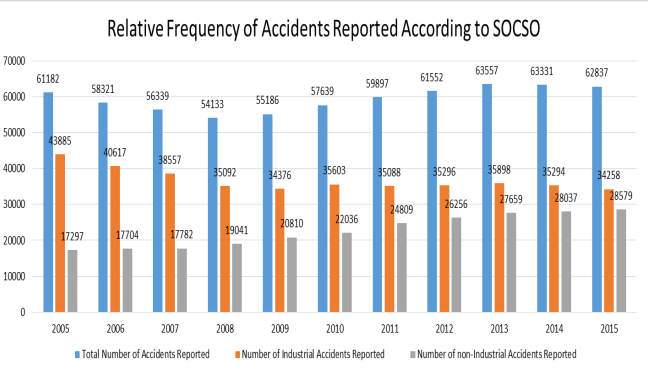

Fig 3: Relative frequency of accidents reported

The total number of accidents took a dip from 2005 to 2008 from 61,182 to 54,133. This is largely due to the economy crisis Malaysia was going through at that time. As with most of the East and Southeast Asian economies, the impact of the global economic and financial crisis on Malaysia has been felt largely through a contraction in aggregate demand caused by a collapse in exports, either directly or indirectly (Zainal Abidin & Rasiah, 2009). The number of industrial activities slowed down during those years hence resulting into lower number of accident cases reported.

For example, during economic crisis in 1997, both the volume and cost of production was reduced by firms in order to decrease the demand aggregate (Mohd Said, Said, & Abdul Halim, 2012). This includes laying off the unskilled and less experienced workers. These workers are the one normally more vulnerable to occupational accidents. Hence the number of accident cases during the economic recession were reduced by running the jobs with skilled workers.

The numbers then gradually increases back a few years later as the economy in Malaysia slowly regenerating. As the economy began to recover in 1998, number of employment also began to increase. This is mainly due to the increase of production. This means that hiring new workers during the economic upswing resulted in people working who are not accustomed to the hazards in their new job. Therefore the number of accident cases gradually increases throughout those years.

As for industrial accident cases, the number decreases slowly from 2005 to 2008 and then remained almost constant till present. This shows that after 2008, Malaysia have found a way to keep the number of industrial accident cases from increasing back. This could be attributed to the remarkable improvement in workspace safety and health. On the hand, Malaysia is still trying to make the numbers lower but couldn't make any significant drop.

From the figure 3 above, we can translate it into annual accident rate. The accident rate can be seen in the figure 4 below. The accident rate is tabulated as per 10,000 workers.

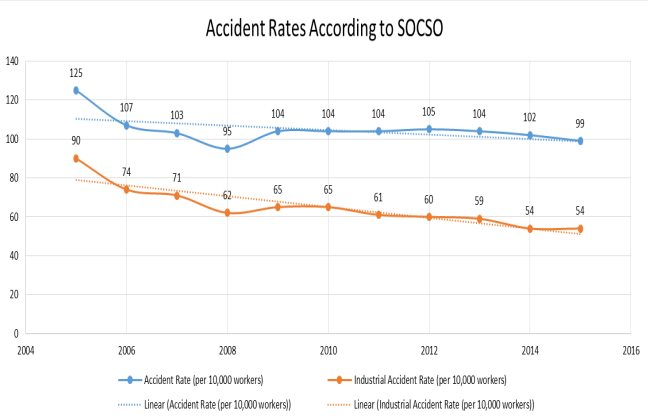

Fig 4: Accident rates

The graph took a huge dip in 2005 as it falls rapidly into 2006. From 2006 onwards, the graph decreases gradually every single year with an exception in 2008 where the number drop a little bit extra from the others. As mentioned before, this is due to the economic crisis suffered by Malaysia in 2008.

From 2005 to 2015, the rate of industrial accident cases drops from 90 to an average of 59.5 every year. This shows that Malaysia have managed to lower down the number of accident cases in the industry. This means that Malaysia have more attention in bringing the number of accident cases down. Safety is being focused more by the industry and being taken more seriously now. This number may decrease lower in years to come.

It can be shown from the linear line in the graph, the number only exceeded the decreasing trend in 2013 whereas all the other years showed numbers below the linear line.

B. Category of the accident cases reported

Industrial accidents can be classified into a number of sectors. Each of those sectors contributed to the number of accidents recorded every year. According to the annual reports by SOCSO, the number of accident cases according to sectors can be seen in the figure 5 below.

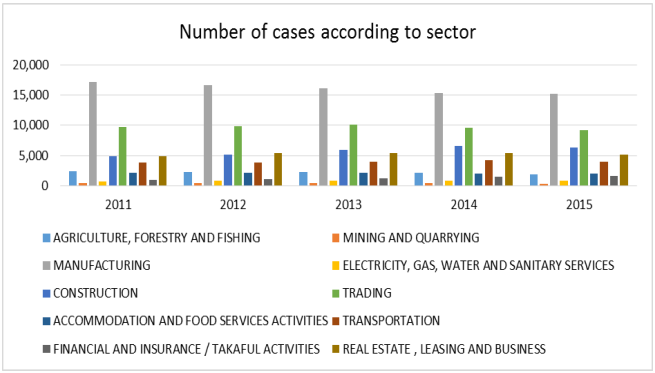

Fig 5: Number of cases according to sector

From figure 5, it can be concluded that the highest number of accident cases comes from manufacturing industry. This is because the manufacturing industry is the biggest industrial activity in Malaysia. They contribute the largest amount in Malaysian economy. The manufacturing sector grew at a faster pace, driven by the strong performance of the electronic and electrical cluster as external demand improves, particularly global semiconductor demand (Hooi, 2016). Malaysia has been ranked as the world's top manufacturing location in new suitability index by Cushman and Wakefield (Business Circle, 2014). Hence, the number of workers in the manufacturing is also high which make it more likely to contribute to the accident rate. This reflects workers in the manufacturing sector are exposed to higher accidental risks.

The second highest contributor is the trading company. Malaysian economy also depends a lot on the import and export business which leads to abundant number of accident cases. This followed by the construction industry. This can be proved by the large number of construction sites all around the country.

Department of Safety and Health (DOSH) also reported the number of accidents across all industries in Malaysia. The data was tabulated into two section which is accidents by sector and accident by state. The data consist of number of death, non-permanent disability (NPD) and permanent disability per year.

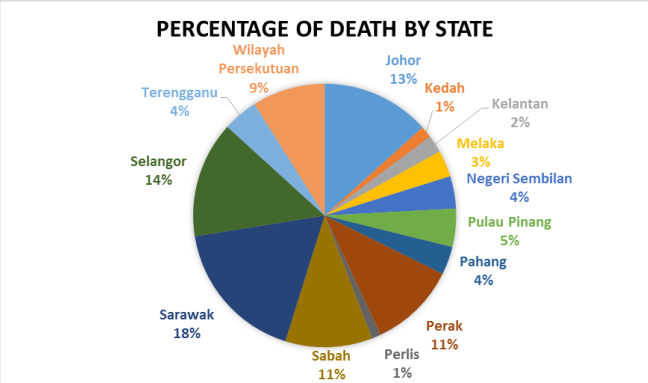

Fig 6: Percentage of death cases

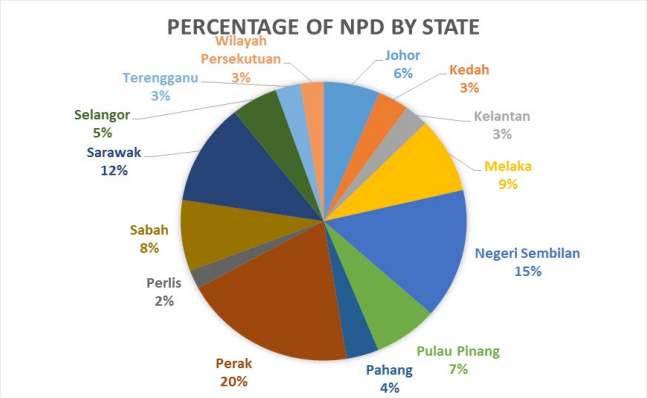

Fig 7: Percentage of non-permanent disability cases

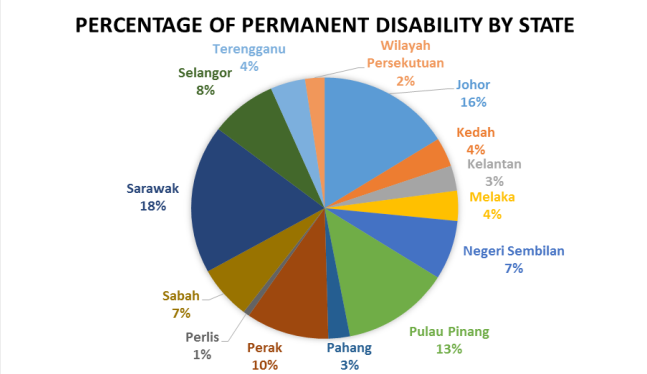

Fig 8: Percentage of permanent disability cases

Figures 6, 7 and 8 above are based on average number of cases for 5 years from 2011 to 2015. Based on the figures above, Sarawak and Perak are the states who recorded the highest number of accidents either it be death, NPD or even Permanent Disability cases. The pie charts above show the percentage of total number of cases from 2011 to 2015. As for total number of death cases by state, Sarawak top the chart by 18% or 173 cases in the space of 5 years. This is followed by both Selangor and Johor with 14% and 13% respectively.

As for NPD cases, 2434 cases were recorded in Perak which is the highest among other states. This is equivalent to 20% of total cases recorded. It is then followed by Negeri Sembilan and Sarawak with 15% and 12% respectively.

As for Permanent Disability cases, Sarawak recorded the highest number of reported cases with 148 or 18%. Johor follow closely with 16 % and Pulau Pinang with 13%.

C. *Fatality Rate*

Years after years, death cases by industrial accidents have been reported. There are statistical data to show the trend of this fatalities among industrial accidents. The rate of accidents and fatality in Malaysia in a 10 years period (2005-2014) are shown in the figure 9 below. The data was taken from the Department of Safety and Health Malaysia (DOSH).

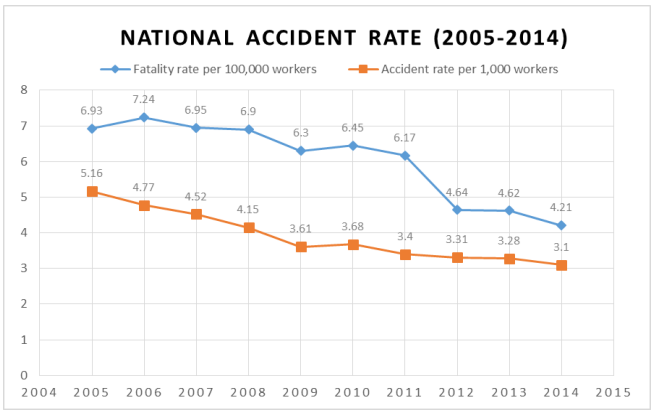

Fig 9: National accident rate

Based on the figure 9, the rate of accident per 1,000 workers decreases gradually along the years from 2005 to 2014. This shows that Malaysia has taken actions to combat the number of accidents that is happening year after year. This also mean that the accident management and lesson learnt are well taken by the government of Malaysia.

As for the rate of fatality per 100,000 workers, the numbers was constant up until 2012 where it took a noticeable drop from an average of 6 per 100,000 workers to an average of 4 per 100,000 workers. This shows that the number of fatal casualties in Malaysia has decreases. This is clearly showing positive sign of the management of industrial accidents in Malaysia.

D. *Comparison of fatality rate with other countries*

There are also statistics provided from other countries regarding the industrial accidents. United States Department of Labor through the Bureau of Labor Statistics has been providing data of occupational injuries every year. The data are separated to fatal and non-fatal injuries. The number of fatal work injuries are shown in the figure 10 below.

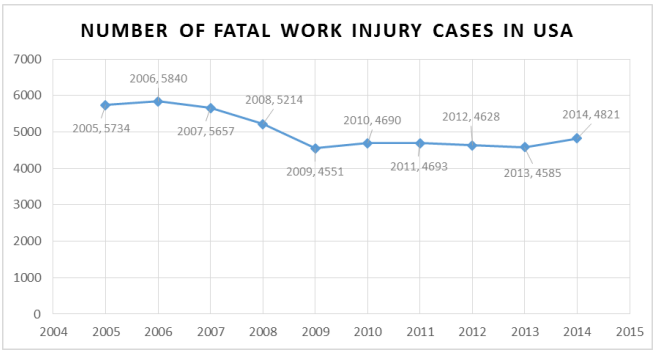

Fig 10: Number of fatal work injury cases in USA

According to figure 10, the number of fatalities due to industrial accidents in the United States are far greater than in Malaysia. In the space of 5 years, Malaysia has recorded an average number of 196 deaths (Total 981) per year. As for the United States, the number of fatal injuries are 22877 in total or an average of 4575 per year. That is approximately 23 times more than the numbers in Malaysia. This is mainly because of the number of population in the United States which is far greater than Malaysia.

Besides United States, United Kingdom also shared their statistics information to public. The data source which has been designated as a National Statistic according to the UK Statistics Authority. This is shown on the figure 11 below.

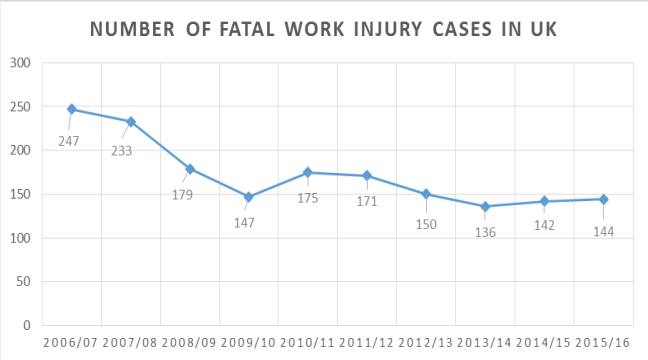

Fig 11: Number of fatal work injury cases in UK

From the graph above, the total number of fatal work injuries in the United Kingdom are relatively similar to Malaysia. They have an average number of 172 fatalities per year whereas Malaysia has an average of 196 death per year.

As conclusion, the comparison between number of fatality cases between Malaysia, USA and United Kingdom can be seen in the figure below.

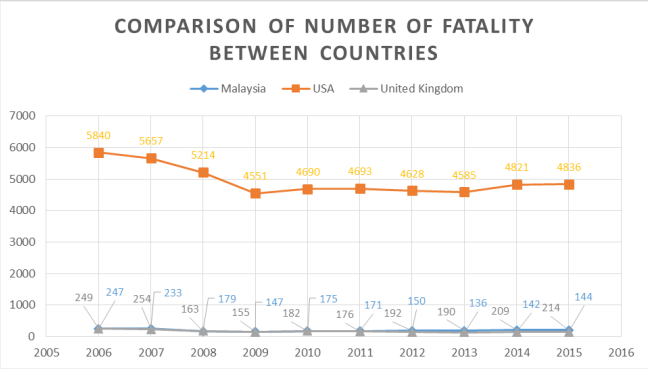

Fig 12: Comparison of number of fatality cases between countries

E. Accidents reported according to gender

The workers in the industry consist of both the male and female populations. Thus both gender are expose to the hazard in their workplace and open to face accidents during working. It is important for both gender to understand the importance of occupational safety and health. The figure 13 below shows the number of accidents reported according to gender in Malaysia.

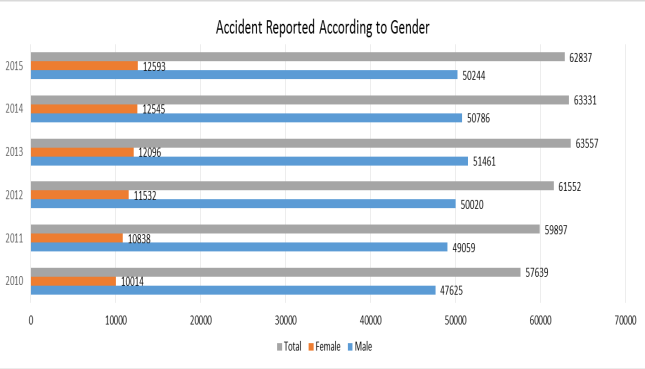

Fig 13: Accident reported according to gender

From the graph, approximately 80% of the accident cases reported annually are male cases. This is because the industry are mainly dominated by male workers. More male workers can be seen in the industry because it consists of more physical works. Thus less female are likely to be involve the industry. An analysis have been done showing males are three time more likely to be injured at work rather than female (Oi, 1974). This includes various aspects of the industry such as establishment size, characteristics of workers and also labor turnover.

When it comes to performing some task, women are said to be physically less capable in some aspects (Lin, Chen, & Luo , 2008). Even though, participation by women in the industry still increases resulting from the industrialization era. Most of them are usually assigned the same tasks as men. In addition, workplace and machinery designs are usually designed to fit male's capacity (Taiwo, Cantley, Slade, Pollack, & Vegso, 2008). Hence, the risks faced by both the male and female are relatively similar, but the impact might differ due to women physical anthropology.

F. Benefit paid for accident cases

According to the Ministry of Human Resources, every workers in Malaysia must be registered under the Social Security Organization (SOCSO). This is to provide protection and leverage for the workers in term of occupational safety. This is considered as benefits for the workers. Every time a worker being involve with occupational accident, they will be protected and provided a compensation. This is usually be in term of monetary compensation. The amount of compensation are usually determined by courts of Malaysia after various verdicts.

The figure 14 below shows the benefit paid for the accident cases in Malaysia. The benefit paid are separated into three part which the benefit paid for death cases, benefit paid for permanent disability cases and also non-permanent disability cases.

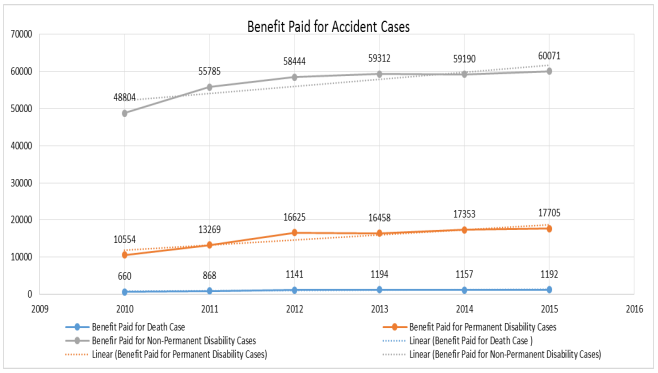

Fig 14: Benefit paid for accident cases

From the figure 14 above, non-permanent disability cases are the highest acceptor of the benefit paid every year. The amounts are four to five time larger than permanent disability and death cases. This is parallel to the amount of non-permanent disability cases reported every year.

The second highest in term of benefit paid is for permanent disability cases. It recorded an average number of 15,327 cases every year. Lastly, the lowest number of benefit paid are for death cases. The average number of cases annually are 1035 cases.

In 2015, the total number of non-permanent disability cases reported are 60,071. According to SOCSO's annual report, this is equivalent to RM 177,862,173 in total of benefit paid to those affected. On average, every single case is paid an amount of RM 2,960.

As for permanent disability cases reported, the amount are 17,705 cases. The benefit expenditure are said to be RM 470,595,543. This is an average around RM 26,579 per cases that need to be paid.

The amount of death cases reported in 2015 are said to be 1,192 but the amount of benefit paid are RM 263,264,252. Therefore the average of benefit paid per cases are around RM 220,859.

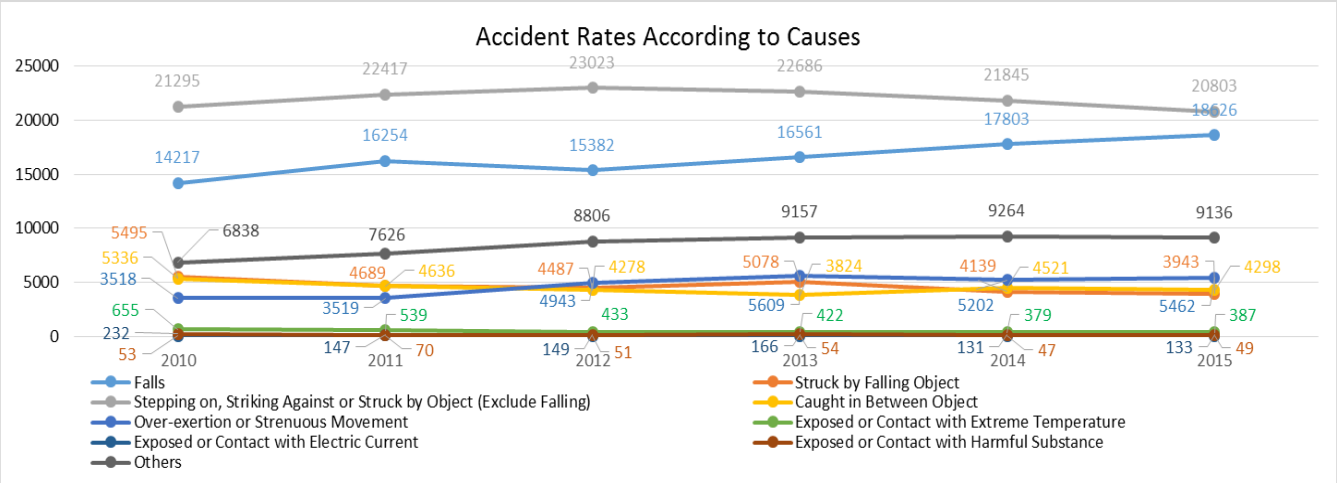

Fig 15: Accident rates according to causes

Even though the number of non-permanent disability cases are the highest, but it cost SOCSO the least expenditure compare to the other two type of cases. This is because temporary disablement are considered as low priority cases. Thus number of compensation are also low.

Death cases produces the highest number of compensation paid which is RM 220,859 per case on average. This is considered as high priority cases because it involve with people's lives. This benefit is also known as dependents' benefit as the compensation usually goes to the dependents of the victim. The dependents are usually family members.

G. Number of accident cases according to cause

After investigating the agents of accidents, a statistical data was generated. Figure 15 above shows the causes of reported accident cases for 2011-2015 according to SOCSO.

The most common type of accident is stepping on, striking against or being struck by objects. This occur when a worker is strike or ran over by movie construction equipment (Chong & Low, 2014). During 2011 till 2015, there are a total number of 132,609 cases reported for this type of causes. On average, it is around 22,011 cases per year.

Next on the figure is falls. It is the second highest cause of accidents reported. An annual average of 16,473 cases reported in Malaysia. This can also be considered as a critical cause. Previous studies also pointed out that falls were the most common type of accident in the construction industry (Huang & Hinze, 2003).

The third highest group of accidents is the group including other non-classified types of accidents such as structure collapse, electrocution, fire, drowning, explosion and toxification. This group has an average number of 8,471 cases per year.

Accidents involving being in between objects were reported 4,482 times per year (26,893 in total for 2011–2015). These accidents were usually caused by being buried inside a hole or trench. In most situations, the soil collapsed and trapped workers. This kind of accident attracts attention of the public.

Overexertion or strenuous movements are another type of accidents in industry. A compressed work program and delays in a project schedule are the reasons of accidents. Figure shows that the number of accidents caused by overexertion or strenuous movements increases (4,708 cased on average each year).

IV. Conclusion

This paper sought to analyze the past major industrial accidents in Malaysia. This include the study of the meaning and difference between accident and industrial accidents. Besides that, the type and causes of the accidents are also being discussed in order to get a better understanding of the reason why accident usually occurred. Example of past major industrial accidents were also being reviewed including some landmark accidents that has rocked Malaysia before.

Therefore, statistical data was developed in order to review the magnitude and frequency of accidents that has happened in Malaysia before. From the analysis of the accidents, some conclusion that arises are the majority of accident cases reported in Malaysia are industrial accidents. Out of the total number of accident cases, 60 to 70 percent of it was industrial accidents.

The economy tend to affect the number of accident cases as it directly related to the industry in Malaysia. This shows during the economy recession in 2008 where the number of accident cases reported dropped due to the slow industrial activities during that time.

Out of all the sectors of the industries, the manufacturing industry is the biggest contributor in the accident cases reported in Malaysia. This is followed by trading industry and the construction industry.

On the other hand, accident cases reported are classified into few categories such as death cases, non-permanent disability cases and permanent disability cases. Sarawak and Perak are the states who recorded the highest number of cases in Malaysia either it be death, NPD or even permanent disability cases.

As for the causes of the accidents, the main cause of accident in Malaysia is stepping on, striking against or being struck by objects. This is followed by falls. Besides that, majority of the number of accident cases reported are from the male gender. This is because the industry are mainly dominated by male due to all the physical works.

On the bright side, the fatality rate is decreasing along the years as Malaysia has taken serious actions to deal with the number of accidents happening every year. The trend of fatality rate are relatively similar with United States of America and United Kingdom. All countries showed decreasing trend in numbers of industrial fatality every year.

Through the data gathered from this study, it concluded that there are still works to be done in order to overcome the number of industrial accidents in Malaysia. All parties should play their part in making sure that the industrial accident rates be as low as it could be. Full support from the Malaysian government is also essential to make sure they practice safe working culture in the industry.

This findings could provide useful reference for further study on safety management and precautions. It can be a tool to raise safety awareness among the industries.

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