WORKPLACE: A STUDY OF THE EMERGENCY PREPAREDNESS OF THE EMERGENCY RESPONSE TEAM VIS-À-VIS THE OCCUPATIONAL SAFETY AND HEALTH ACT 1994

By

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ABSTRACT

Hazardous materials are chemical substances, which if released or misused can pose a threat to the environment or health. Recently, various type of crisis or emergency due to hazardous materials handling had occurred at the workplace due to human negligence and weaknesses which causes loss of lives and property. Accidents at the workplace involving hazardous materials are most often due to release of chemical substances in plants. During an emergency, individuals may panic or overreact. As a consequence early actions have to be taken to address the crisis. Disaster area needs to be secured in order to prevent unauthorized access and to protect the installation and equipment. These initial tasks can be undertaken by Emergency Response Teams (ERT) while waiting for assistance from the relevant authorities to deal with the crisis at hand. This paper will look at the employer's commitment in dealing with hazardous materials accidents at the workplace via the institution of the ERT in relation to the Occupational Safety and Health Act 1994. A random survey using questionnaires was being conducted on the employers and employees in manufacturing companies to ascertain the employers and employees

commitment towards managing hazardous materials at the workplace. The results of the survey indicate that the employers comply with the relevant laws and that sufficient training and proper equipment were provided for the ERT. The employees on the other hand were also provided with appropriate arrangement if emergency situations occur.

Key words: role of ERT, regulations, emergency preparedness, safety measures

Introduction

All workers have a right to work in the workplace where risk to their health and safety are properly controlled. The obligation to ensure these situations exist lies with the employer. However, workers must also be aware of their responsibility not to endanger themselves or others. Recently various type of crisis or emergency had occurred at the workplace due to human negligence and weaknesses which causes loss of lives and property. These phenomenon including accident due to hazardous material, fires, explosions, chemical spills, toxic gas releases will continue in every organization if safety at the workplace is neglected. On the contrary, if accidents due to hazardous material happen at the workplace, how does the employer and employee deals with such a phenomenon?

If such a disaster occurs at the workplace, disaster area needs to be secured in order to prevent unauthorized access, loss of life and also to protect the installation and equipment. One of the commitments of employers in the management of accidents at the workplace involving hazardous materials is via the institution of the Emergency Response Teams (ERT). The ERT is the first responder in emergencies to deal with the crisis at hand while waiting for assistance from lead agency.

In Malaysia, the management of disaster is governed by the National Security Council (NSC) Directive No. 20: Policy and Mechanism of Disaster Management and Relief Committee. The Directive interpreted "Disaster" and "Non-disastrous incidents". In addition, at the moment, the specific act and regulation which deal with the safety at the workplace is the "Occupational Safety and Health Act (OSHA) 1994".

Problem Statement

Emergency situation or disasters such as accident due to hazardous material, fires, explosions, chemical spills, toxic gas releases occur at the workplace due to human negligence and weaknesses. This disaster must be deal with immediate so as to control it from spreading out. To handle these situations, management establishes the ERT. The role of the ERT is to deal with the disaster while waiting for the lead agencies to be at the scene of the disaster. For the ERT to be effective, it needs proper Personnel Protective Equipment (PPE). At the same time the ERT should be trained and be equipped with the related knowledge i.e. the relevant laws and the mechanism of disaster management in the Malaysian environment. Does the ERT institute at the workplace by the management have the distinctiveness refer to aforementioned?

Aim

The objective of this paper is to:

a. Highlight the employer's commitment in dealing with hazardous materials accidents at the workplace via the institution of the ERT with reference to the relevant laws.

b. Present the Malaysian Mechanism in Disaster Management involving hazardous material. .

Laws at the Workplace

The OSHA 1994 endower to promote stimulate and encourage high standards of safety and health at work. The Act was promulgated based on the philosophy of self regulation, consultation and cooperation. The Acts underlying principle is that maintaining health and safety should be the responsibility of those who create the hazard at the workplace. Thus the employer is legally and socially bounded to ensure a safe and conducive workplace for the employees. The regulatory proviso for setting up of ERT under the OSHA 1994 in the organisation which is implied and written is institute in Part IV, Section 15, OSHA 1994 and the OSHA 1994, Occupational Safety and Health (Control of Industrial Major Accident Hazards) Regulation 1996. The other regulatory requirement which ERT must take cognize of are the Fire Services Act and Regulation 1998 (Act 341), Petroleum (safety Measures) Act 1984 (Act 302) and Gas Supply Act 1993 (Act 501).

An ERT is an in-house squad institute by the organization to deal with emergency situation which happen or may happen in its premise. An ERT is thus a

special team that responds to emergencies to ensure proper personnel evacuation and safety, shut down building services and utilities, work with responding civil authorities, protect and salvage property, and evaluate areas for safety prior to re-entry[4]. Although these ERT are trained to meet the internal needs of their business entity, however in a major disaster such as chemical spillage, chemical plant release of hazardous gas, fire at he workplace, these ERT has to work closely with other relevant government agencies such as the Fire and Rescue Department.

Mechanism of Disaster Management

Does the Malaysian Mechanism of disaster management deals with accident involving hazardous materials? The mechanism will be discussed subsequently. In Malaysia, the management of disaster is governed by the National Security Council (NSC) Directive No. 20: Policy and Mechanism of Disaster Management and Relief Committee. This policy is an executive order from the Honourable Prime Minister was issued on 11th May 1997. The Directive interpreted "Disaster" and "Non-disastrous incidents".

The handling and resolving of disastrous disaster in Malaysia are currently conducted through the committee system which emphasis on the concept of coordination and mobilization of agencies involved in an integrated and coordinate manner - the Disaster Management and Relief Committee at the Federal, State and District Level respectively. The Mechanism and Machinery for handling disaster is shown at **Figure 1.**

[4] Occupational Safety and Health for Technologists, Engineers and Managers, David L. Goetsch, Pearson Prentice Hall, Fifth Edition, 2005, Page 350.

The Malaysian mechanism of employment of responders in emergency or disaster situation begins with "On receiving a disaster report". At this juncture, the District Disaster Management and Relief Committee (JPBBD) which is headed by District Officer should be mobilized to manage disaster. This is to ensure all activities of search and rescue operation, taking over and preparation of facilities and machinery and other emergency aid is fully coordinated.

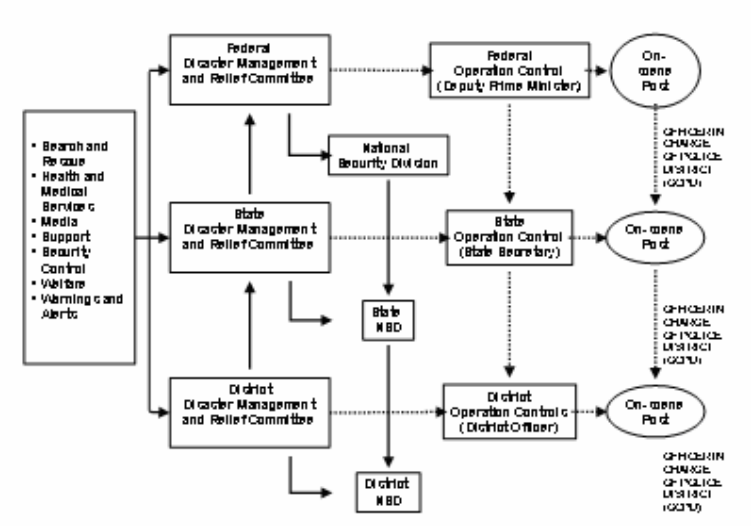


FIGURE 1. MECHANISM AND MACHINERY IN HANDLING DISASTER

Assistance to the next level is made that is the state level if the district cannot handle the disaster. The whole management and control of Level II Disaster headed by State Secretary will be taken over by the state. However, when the disaster administration is taken over by Central Level (Level III Disaster), all related agencies and sources available at District and State level will be combined to face disaster that occurred. To ensure the efficiency in the management of disaster, the Control Post on Scene (PKTK) and Disaster Operation Controlling Centre (PKOB) is established.

Control Post on Scene (PKTK) should to be activated instantly when an incident is classified as a disaster and where joint operation involving various agencies is required. The authority to activate the control post lies with the District Police Chief. He is also responsible:

a. To assign and appoint other member consisting a members of Royal Malaysia Police (PDRM) and members of other agencies to manage the operation at this control post.

b. To assess, to control and to coordinate all search and rescue activities on the scene.

Simultaneously **Disaster Operation Controlling Centre (PKOB)** has to function in accordance to the stage of disaster management at the District Office, BKN State Operation Room or BKN Operation Room so as to monitor the development and decide on the means of facing disaster effectively. All of agencies involved in the disaster management must position a liaison officer for their agency at PKOB. This is to ensure speedy action to be taken base on the decision made by the Disaster Management and Relief Committee.

For disaster which is classified as non-disastrous, the relevant agencies can handle using minimum resources and facilities at local level**. In case of disaster caused by fire or hazardous materials (hazmat), Fire and Rescue Department Malaysia will act as a main agency to handle it.** ERT has a role to contribute and play in both disastrous and non disastrous disaster in assisting the government machinery.

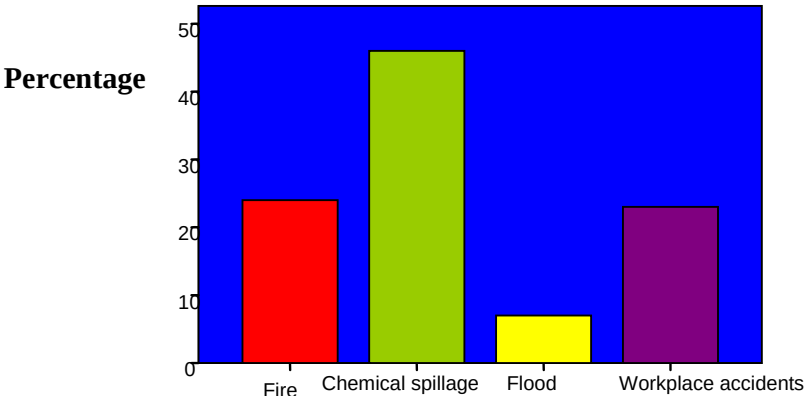
Research Survey on Social Commitment of Employers

A quick random survey is made on 100 selected employees comprising from the various manufacturing companies in Perlis and Kedah using Questionnaires. Simple frequency distribution was used to analyze the data collected. The objective of the survey is to ascertain the commitment of employers in the management of accidents at the workplace involving hazardous materials via the institution of the emergency response team. As mentioned earlier all the data obtained were analyzed using the SPSS software. In order to ascertain the employer commitment in dealing with hazardous materials, 9 questions were presented to the respondents. The result of the survey is explained forthwith

Survey Results

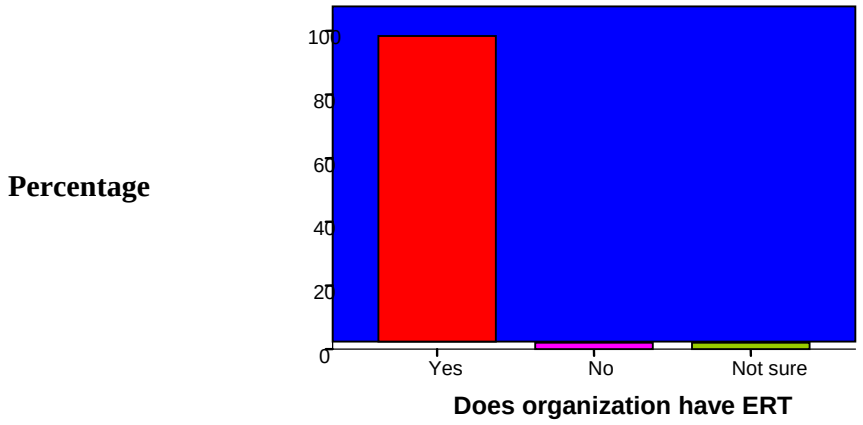
. Question on the type of disaster their organization is prepared for were posed to the respondents. The result of the survey at **Diagram 1** established the type of disaster preparedness of the organization in emergency situation where 46 percent of the respondents indicate “chemical spillage” while 24 percents indicate “fire” and 23 percent “workplace accidents” and 7 percents indicate flood disaster.

Diagram 1: Type of disaster organization is prepared for



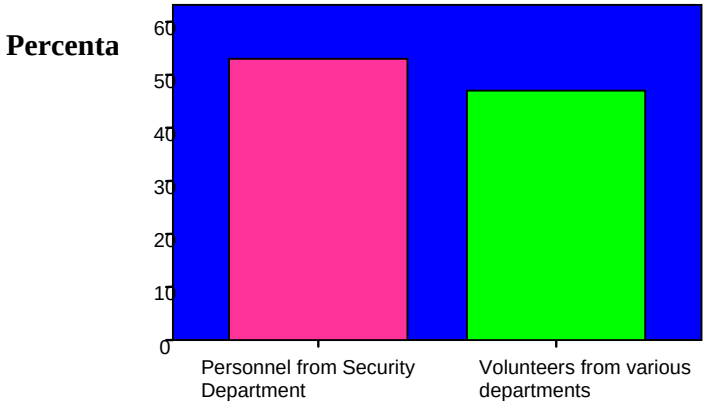
To establish the employer responsibilities towards their employees safety in emergency situations such as accident due to hazardous material, fires, explosions, chemical spills, toxic gas releases occur at the workplace, respondents were posed with a question whether their organization's have ERT. The result of the survey at **Diagram 2**, indicate 96 percent of the respondents specify that ERT is established by the management at their workplace

Diagram 2: Does organization have ERT



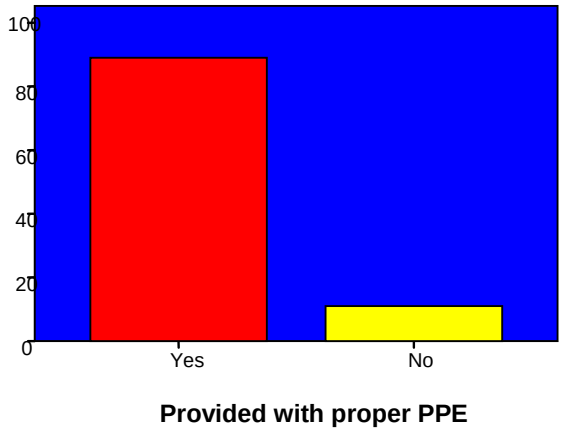
. The respondents were also asked about the composition of the ERT in their organizations. The respondents at **Diagram 3** indicate that the composition of the ERT is made-up of both the personnel from the Security Department and of volunteers from the various departments found in the business entity. However 53 percent of the respondents indicate in most business organizations, the personnel from the security department of the business entity plays the lead role.

Diagram 3: The composition of ERT



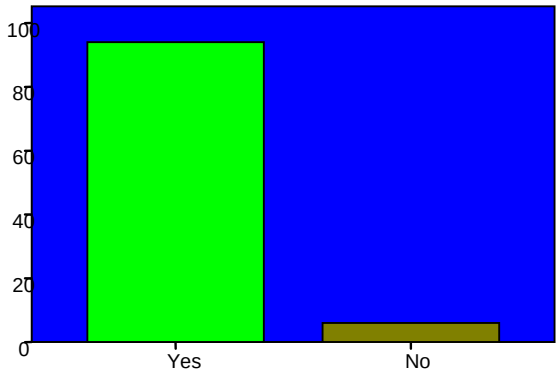
To establish on the preparedness by the employer towards safety of the ERT in particular when employed for disaster or emergency situations, the respondents were posed with a question as to whether the ERT were provided with proper PPE. The results of the survey at **Diagram 4** indicate 89 percent of the respondents said that the ERT are provided with the necessary Personnel Protective Equipment (PPE). .

Diagram 4: Provided with proper PPE



The respondents were also asked whether the ERT is given proper training to undertake disaster tasks. The result of the survey at **Diagram 5** indicates that the ERT are trained to handle emergency situations. This is confirming by an affirmative answer by 94 percents of the respondents. From the random survey it was established that business entities institute the ERT to meet their internal needs to handle disasters such as or Workplace Accident such as chemical spillage, fire, workplace accidents and flood disaster.

Diagram 5: Provided with adequate training



The respondents were also asked on the type of emergency drills being conducted by their organization. The result of the survey at **Diagram 6** indicates that the organization they work does carry out their emergency response training. According to the respondents the focus of the drills and exercise is on chemical spillage fire and work place accidents followed by floods. The results indicate the following that is

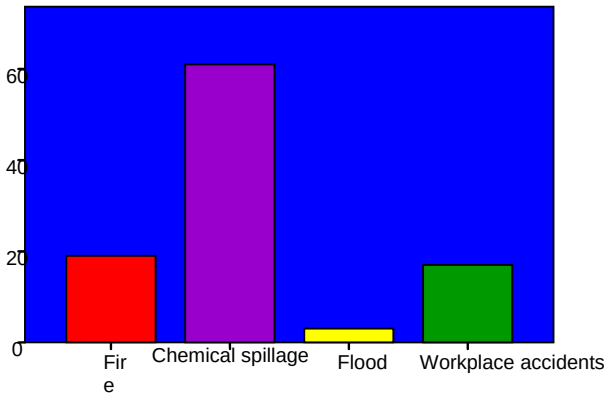
a. Chemical spillage - 61 percent

b. Fire - 61 percent

c. Workplace accidents - 17 percent

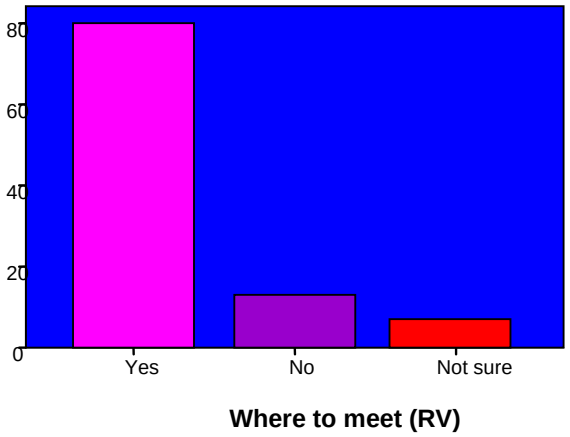
d. Flood - 33 percent

Diagram 6: Type of emergency drills being carried out



If the building they are in were to be vacated, the respondents were asked were asked with a question of where to meet or RV in case of emergency. The result of the survey at **Diagram 7**, indicate 80 percent of the respondents' specify that they are aware of the rendezvous or where to assemble in emergency situations

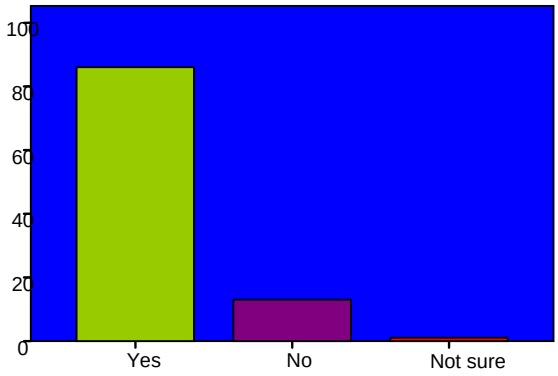
Diagram 7: Where to meet (RV)



The respondents were also asked whether they know how to call for help during emergency situations. The result of the survey at **Diagram 8** also indicates

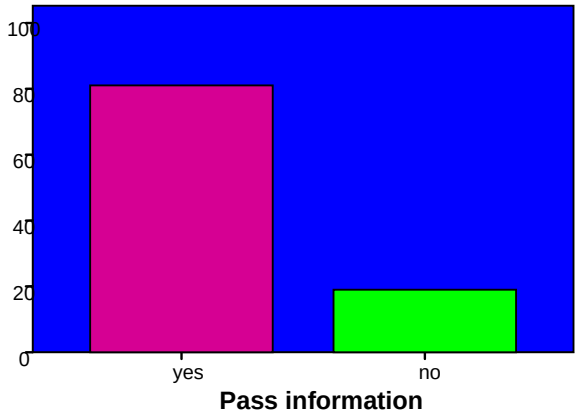
that the 85 percent of the respondents are aware of the process of calling and alerting on site personnel or other relevant authorities during emergency situations.

Diagram 8: Call for help



The respondents were posed on the question about the passage of information to the relevant authorities during emergency. The result of the survey at **Diagram 9** indicate 81 percent of the respondents know how to pass relevant informations to the relevant authorities in emergency situations

Diagram 9: Pass information



Overall Outcome

From the survey, it is established that employers have both social and legal commitment towards ensuring a conducive, save and healthy work environment at the workplace. The employers establish the ERT at the workplace. The main task is to deals with emergency situations at the workplace such as chemical spillage, fire, workplace accidents and flood disaster. The ERT are provided with the necessary Personnel Protective Equipment (PPE). The organization they work does carry out their emergency response training. The employer too has design plan for their employees in term of how to call for help during emergency situations, pass information and the rendezvous or where to assemble in emergency situations etc. It is concluded that the business entities are also prepared to meet any disaster situation which occurs at their premises

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Mechanism in Deployment of ERT in Emergency Situation

Emergencies such as fires, chemical spills, leaks and explosion are all frequent industrial accidents. The main concern is to avert emergencies mention aforesaid. Consequently if the accident does happen, what is the course of actions? We need to know how to response to the incident. In cases of industrial accidents involving hazardous materials, Fire and Rescue Department Malaysia will act as the main agency to handle it.

What are the potential circumstances involving hazardous materials which business entity or the ERT in particular will face? A possible situation is there is a leak of hazardous gas in a factory building, fire or a major spill of known or unknown substance (radioactive, toxic, flammable etc) is observe or reported. The spill may be on the floor in the same building or another part of the building or in a place that could affect the general area. What do we do? The main concern is to avert emergencies mention aforesaid. In cases of industrial accidents involving hazardous materials, Fire and Rescue Department Malaysia will act as the main agency to handle it.

On 19 November 2007 two crude oil storage tanks belonging to Shell Malaysia oil refinery in Port Dickson were struck by lightning and catch fire. When fire broke out, the ERT was immediately deployed “on-site” to control the situation. A major blaze would have occurred. However the quick action of the company’s ERT had averted the occurrence a major blaze. The ERT Shell Malaysia oil refinery were soon joined by 52 firemen from Seremban, Port Dickson, Telok Kemang and Rantau fire stations and the ERT from ESSO. The fire which started AT 7.06 a.m.

was controlled at 8.08 a.m. and doused completely at 10.30 a.m. As at 3pm operations at the plant was back to normal[5].

The process of preventing, preparing for, responding to and recovering from hazardous material incidents can be taken by using the process of emergency management. The processes of emergency management involve 4 phases: **Mitigation, Preparedness, Response and Recovery** as shown in **Figure 3**. For emergency management to be successful, all echelon of the business entity must work together and incorporate their response capabilities. How does the system benefit the business entity in general and the ERT in particular? The four phases as used within the emergency management system to response to hazardous materials incident are described beneath.

Preparedness Phase

What constitute preparedness? Preparedness constitute of activities carry out in advance before an emergency strike. These activities are basically planned to boost preparedness capabilities and improve response to hazardous materials incidents. Preparedness activities which are carry out is aim at all levels of the business entity. This is to ensure that when an emergency or disaster strikes, emergency responders (ERT) and managers will be able to provide the best response possible. Some of the preparedness activities would consist of but not restricted to hazard or risk analyses, training, drills and exercises, emergency plans and procedures, emergency communications, joint cooperation consensus, warning systems procedures and

[5] New Straits Times, 20 November 2007, Ridzwan Abdullah

response planning. In addition it also incorporates a medical surveillance program to protect the health and safety of ERT responders. Preparedness in addition takes into account of inspection and enforcement programs.

Training

In the preparedness phase business entities are responsible to ensure that their ERT and employees receive the appropriate training and equipment necessary to perform tasks that may be required during an emergency response. It is suggested that the training program ought to consist of at a bare minimum recognition of hazards, selection, care and use of personal protective equipment, and safe operating procedures to be used at the incident scene. It is also advice that in an emergency response, both the individual responders and their organizations ought to avoid performing task for which they are not trained or equipped.

Drills and Exercises

To test the efficiency of an ERT, its emergency plans and procedures, its training effectiveness, and equipment is by conducting drills and exercises. There are different types of exercises which can be implemented at the workplace. The drills and exercise are such as Functional Exercise or Full-Scale Exercise etcetera to evaluate a plan. Drills and exercises must be conducted regularly in practical situations or as depicting real situations so as to develop the response organization (ERT) into an effective coordinated team, which can functions efficiently during an actual emergency. The end results of drills and exercise are:

a. It enables the organization to determine the effectiveness of the emergency plan and the organization capabilities and limitations in deploying ERT.

b. It enables the process of improving plans and procedures.

c. It enables in identifying any under performance in response resources.

d. It enables the evaluation of the effectiveness of training.

e. It allowing responders to get integrate with one another and practice their skills.

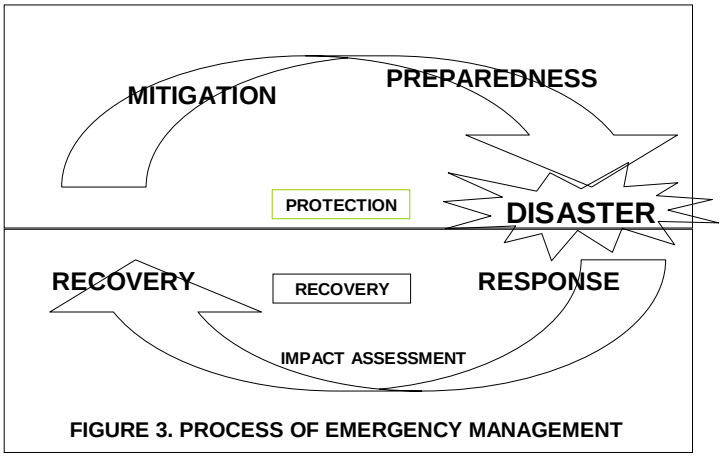

FIGURE 3. PROCESS OF EMERGENCY MANAGEMENT

Emergency Plan

A sound disaster response plan should be developed. The plan should take into consideration the following aspects:

a. A chain of command with clear written policies which incorporate the responsibility of the management.

b. Name, designation of person responsible to activate the emergency plan.

c. Specific instruction on stoppage of work at the workplace.

d. Map and layout of the plant, office, machinery layout and escape route.

e. A list of cooperating agencies and how to contact them.

f. The Warning system and its method of activation.

g. Reporting and evacuation procedures.

Response Phase

The response phase consists of the immediate response to hazardous materials incident by the ERT. It is aim at containing the disaster so as to minimize loss of life and destruction to property. Response to a hazardous materials incident includes measures such as notification, implementation of emergency plans, activation of emergency operation centers, mobilization of resources, issuance of warnings and directions, provisions of medical and social services assistance, and announcement of emergencies or disasters by the management. A successful response may or may not totally remove the hazard to human health and the environment. The mobilization of ERT for hazardous materials incidents needs what is term as “Notification”. Notification is the process that ensures that the appropriate entities are informed of a hazardous materials incident containing the related details such as “who, what, when, where”. Therefore in hazardous material the following measures are applicable at the workplace:

a. Notify your supervisor, coworkers and others in the area.

b. Simultaneously, activate emergency alarms.

c. Activate the ERT and the Emergency Operation Centre.

d. Evaluate hazards and Call 999 to get help.

e. Leave the area if the spill cannot be readily contained, or if it presents an immediate danger to life or health. Follow the evacuation rules.

f. Keep people out of the area.

g. Don't try to rescue or help injured people unless you're sure you will be safe.

h. Don't try to clean up a spill yourself except where permitted by site rules. Leave the cleanup to trained personnel, such as a Hazardous Materials (HAZMAT) team.

Activation of Emergency Operations Center.

To ensure the effective management of emergency operations during the release or threatened release of a hazardous material, **Emergency Operations Center** should be activa**t**ed**.** The management is advice to appoint a director or coordinator and advisory committee representing various departments to man the Operation Centre during emergency situations. The aim of activating the Operation Centre is:

a. The management and coordination of emergency operations including coordinating and maintaining liaison with relevant government agencies for emergency response such as the Royal Malaysian Police, Fire and Rescue Department Malaysia, Malaysian Red Crescent Society, RELA etcetera.

b. A certain priorities for requesting emergency response support and make decision on any contradictory demands for support.

c. Providing guidance for identifying and activating communications systems, disseminating warnings and evacuation of employees.

d. The coordination of mutual aid from Multi-agency or inter-agency

What emergency equipment are needed and where or what Personal Protective Equipments (PPE) do we need on this job? First aid kits, Fire extinguishers, Fire blankets, Eye washes, Emergency showers, Communications (radios, alarms, etc.), Stretchers or baskets for moving injured people are the basic essential rescue equipment that should be readily available for normal emergency situation. However in industrial accident involving hazardous materials, proper PPE or HazMat Suit should be used by the ERT. As a guide the PPE for protection required against hazardous materials can be addressed based on the risk and parts of the body to be protected or where contact can take place viz the head protection, face or eye protection, respiratory system (nose/mouth) protection, body protection, hand protection and leg/feet protection. The risk and the suggested PPE associated with hazardous materials to be worn are summarized at Table 1[6].

Recovery Phase

Recovery Phase refers to those measures undertaken following a disaster that will return all systems to normal levels of service. It includes measures such as:

[6] Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, Department of Occupational Safety and Health, Ministry of Human Resources, 2005, Page 14

physical restoration and reconstruction; cleaning up contaminated areas; eliminating and/or reducing any known hazards and restoring businesses.

Mitigation Phase

Reducing the risk to people, environment, and property is the basic goal of emergency management. Mitigation**,** therefore, is considered the principal foundation of emergency management because it helps reduce the number of victims, property loss, and environmental. The mitigation phase is the continuous ongoing endeavor to avert or reduce the impact that a hazardous materials incident will have on people, property, and the environment. The business entity is to carry out "site mitigation programs" designed to investigate and cleanup hazardous substances contamination.. Examples of mitigation activities would include Hazard Mitigation (HAZMIT) Plans & Teams, Hazard Identification, Risk Analysis, Evaluation, Research and Education

Area of Exposure	Risks	Examples of Protection
Head	Splashes, chemical burns, skin absorption	Helmet, bump cap, face shield
Face/Eyes	Chemical burns, splashes, irritation, skin or eye absorption	Face shield, goggles, and safety spectacles.
Respiratory System	Breathing in atmospheric contaminant. Respiratory irritation. asphyxiation	Air purifying respirator. Supplied Air Respirator
Body	Chemical burns, dermatitis, Skin absorption	Hazardous chemical suit, apron, long sleeve shirt
Hands	Chemical burns, dermatitis, skin absorption	Chemical resistance gloves
Legs and Feet	Chemical burns, skin absorption	Safety footwear, leggings

Table 1. Risks Associated With Hazardous Materials

Conclusion

Recently various types of crisis or emergency due to hazardous materials occur at the work place which causes loss of life and property. The OSHA 1994 requires the workers and the employers to be involved in ensuring a safe and conducive working environment at the workplace against risk to safety or health arising out of the activities of person at work.

At this juncture, if any industrial accidents involving hazardous materials were to occur, the main concern is to avert or contain such emergency situations. The basis of action to be taken is based on the NSC Directive No 20 and the OSHA 1994. At the workplace ERT is the first responder in emergency involving hazardous materials while waiting for assistance from lead agencies that is the Fire and Rescue Department Malaysia.

The tasks of ERT in emergency situation are to ensure disaster areas are secured; initial action to contain disaster is taken. In order to ensure that ERT is prepared for emergencies, the model of emergency management is recommended to be implemented.

In conclusion, I and my colleague from the Occupational Safety and Health Unit, University Malaysia Perlis hopes to have a more closer liaison and cooperation with the industries and to share its knowledge with the industries and other institutions in not only the topic discussed aforesaid but in other areas as well

Recommendations

With reference to exploratory study on the social commitment of employers in the management of hazardous material accidents at the workplace, it is establish that business entity has equipped their ERT with the basic requirements to address workplace accidents. The ERT were given some form of training on administering emergency situations. However for improvement, it is proposed that:

a. Management to intensify disaster awareness campaign from time to time towards all workers.

b. Business entity to carry out inter agency and inter company training in emergency response. Designate a person who is responsible for arranging resources and assistance from outside organization.

c. Management to vigorously propagate the procedure of notifying key personnel during an emergency.

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