

**EMERGENCY PREPAREDNESS AMONGST EMERGENCY RESPONSE  
TEAM IN MANAGING ACCIDENTS AT THE WORKPLACE  
INVOLVING HAZARDOUS MATERIALS VIS-À-VIS THE  
OCCUPATIONAL  
SAFETY AND HEALTH ACT 1994**

**By**

**LT KOL (B) AZUDDIN BIN BAHARI  
HANUM BINTI HASSAN**

UNIVERSITI MALAYSIA PERLIS (UniMAP)  
P.O. Box 77, d/a Pejabat Pos Besar, 01007 Kangar, Perlis  
Malaysia

Email: [azuddin@unimap.edu.my](mailto:azuddin@unimap.edu.my)  
TEL: 0124335060

**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). The ERT is the first responder in emergencies while waiting for assistance from the relevant authorities such as the Fire and Rescue Department to deal with the crisis at hand. In addition, to ensure ERT and the management is on alert for emergency situations at all times, the ERT in general and the company or business entity in particular ought to be assessed, at least annually with mock drills and competence evacuations.

Against this background, should a major catastrophe involving hazardous materials strike the workplace will the ERT be ready to manage the crisis? Is their emergency preparedness machinery geared up? What part can the ERT play to contributes in the management of this crisis? This paper endeavor to highlight the role of the ERT in managing accidents at the workplace involving hazardous material.

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

## **Introduction**

Various type of crisis or emergency had occurred at the workplace due to natural phenomenon or human negligence and weaknesses which causes loss of lives and property. These phenomenon including personal injuries, fires, explosions, chemical spills, toxic gas releases, vandalism, natural disasters such as tornadoes and floods, and man-made disasters such as riots and terrorist activities will persist in every business or industry if safety at the workplace is neglected. Emergency preparedness will help to minimize human, property, and economic losses due to any hazardous event.

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”. Consequently, the NSC directive and the OSHA 1994 will be the term of reference use in this study of crisis or emergency at the workplace.

## **Aim**

This paper aim to illustrate the role of Emergency Response Team (ERT) in managing accidents or emergencies at the workplace involving hazardous materials vis-à-vis the Malaysian Mechanism of Disaster Management and the OSHA 1994.

## **Overview of the Paper**

The paper will focus on the following aspects:

- a. Relevant definitions.
- b. Malaysian Mechanism of Disaster Management Relating to Disaster and Hazardous Materials.
- c. Profiles and Role of ERT and success Factors of ERT in Managing Disaster.
- d. Mechanism of Employment of ERT based on Disaster Management Models.
- e. Conclusion and Recommendations

## Definitions

Situation is defined as set of circumstances or state of affairs especially at a certain time<sup>1</sup>.

Emergency is a serious event or situation requiring immediate action<sup>2</sup> which can cause death or injuries to the employees, customers or civilian or can cause stoppage of business activities, interfere with the normal working operations, causes environmental pollution etcetera. Some of the examples of emergencies are such as fires, accidents involving hazardous materials, floods and flash floods, accident involving radio active materials, explosions, disruption to line of communications<sup>3</sup>.

“Disaster” is defined as an incident which occurs unexpectedly, which is complex in nature, causes loss of life, destruction to properties or environment and grind down the activity of the community<sup>4</sup>”. Illustrations of the type of disaster which is covered under the aforementioned directives are<sup>5</sup>:

- a. Natural disasters such as floods, storm, drought, erosions of the beach, soil, land slide or disaster caused by storm and heavy rain;
- b. Industrial disasters such as incident of explosion, occurrence of fire, pollution and spilling of dangerous and hazardous materials from factories, industrial depot and installations that process, produce and store the said materials;
- c. Accidents involving transporting, channelling and moving of dangerous materials;
- d. Collapse of buildings and structures;
- e. Air disasters which happen in populated areas and building areas;
- f. Train collisions or skidding;
- g. Burning, which involve vast areas or fire to high rise building or a special structure where there is a large crowd;
- h. Cracking and breaking up of hydro dams or reservoirs;
- i. Nuclear disaster and radiology involving insertion of nuclear or radio active material where an accident may cause it to be widespread and loss to life, destructions to properties or pollutions to the environment and hinder daily activities;
- j. The release of poisonous gas in public; and
- k. Haze which causes alarm among the public and obstruct the machinery of the civil authorities or economic activity of the state.

---

<sup>1</sup> Penguin Concise English Dictionary, G.N. Garmonsway, Bloomsbury Book, London 1969, Page 1768.

<sup>2</sup> Penguin Concise English Dictionary, G.N. Garmonsway, Bloomsbury Book, London 1969, Page 579

<sup>3</sup> Keselamatan dan Kesihatan Pekerjaan dalam Organisasi, Mohamad Khan, Nor Azimah Chew Abdullah, Ab. Aziz Yusof, Prentice Hall, 2005, page133

<sup>4</sup> MKN Directive No 20 dated 11<sup>th</sup> May 1977.

<sup>5</sup> MKN Directive No 20 dated 11<sup>th</sup> May 1977

Non-disastrous incidents is defined as an accidental incidents in the form of critical or non-critical and involving a small number of victims and effects only to the related victims. The form of the accident or incident has no possibility of spreading. Among the non-disastrous incidents are the vehicle accidents, the small fire or a mishap in a lake or river. Such happening usually can be handled in a time by relevant agencies, using minimum resources and facilities at local level<sup>6</sup>.

Hazardous materials are chemical substances, which if released or misused can pose a threat to the environment or health. Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials<sup>7</sup>.

### **Malaysian Mechanism of Disaster Management including Accident Involving Hazardous Materials**

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 11<sup>th</sup> 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 system emphasis on coordination and mobilization of agencies involved which are grouped into 7 grouping as shown in **Figure 1** to carry out specific task.

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. The Mechanism and Machinery for handling disaster is shown at **Figure 2**.

JPBBD Chairman makes assessments on the magnitude of the disaster and the level of assistance needed. Assistance to the next level is made that is the state

---

<sup>6</sup> MKN Directives No 18 dated 11<sup>th</sup> May 1977.

<sup>7</sup> [http://www.gocolumbiamo.com/EM/Disaster\\_Preparedness/hazmat.php](http://www.gocolumbiamo.com/EM/Disaster_Preparedness/hazmat.php)

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. The State Police Chief and Director of State Fire Brigade will be a commander and deputy commander of disaster operation respectively. The Disaster Operation Commander will make decision on rescue agencies to handle disaster incident as needed.

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. The Director of Internal Security and Public Order, Royal Malaysia Police (PDRM) and Deputy Chief Director of operation, Fire and Rescue Department Malaysia respectively will be the commander and deputy commander of disaster operation. 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 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. .

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. District Police Chief or State Police Chief which is relevant, still hold the responsibility as commander of disaster operation on scene to coordinate the involvement of the other agencies.** Among the non-disastrous incidents are the vehicle accidents, the small fire or a mishap in a lake or river. Therefore going by this directive, ERT has a role to contribute and play in both disastrous and non disastrous disaster in assisting the government machinery.

<b>Central Disaster Management and Relief Committee</b>		
<b>State Disaster Management and Relief Committee</b>		
<b>District Disaster Management and Relief Committee</b>		
<b>Grouping</b>	<b>Organization and Agencies for carrying out operation</b>	<b>Tasks</b>
<b>Search and Rescue</b>	Malaysian Fire and Rescue Department Royal Malaysian Police Malaysian Armed Forces SMART Team (Special Malaysia Disaster Assistance and Rescue Team) Emergency Medical Services Atomic Energy Licensing Board Civil Defence Department	Search and rescue of victims
<b>Health and Medical Services</b>	Emergency Medical Services Malaysian Armed Forces Red Crescent Society Malaysia St John Ambulance	Management of emergency treatment Management of forensic services Management of public health
<b>Support</b>	District Office Municipal/Town Councils Tenaga Nasional Berhad Syarikat Telekom Malaysia Berhad Malaysian Armed Forces Royal Malaysian Police Public Work Department	Logistic support Communication and other assistance for smooth control of operations and overcoming of disaster
<b>Welfare</b>	Welfare Department Emergency Medical Service Red Crescent Society St John Ambulance RELA	Evacuating victims Preparing food for victims/duty officers Providing/managing places for evacuations Providing first aid and counselling services
<b>Media</b>	Information Department Broadcasting Department	Press conference Electronic and media coverage
<b>Security Control</b>	Royal Malaysian Police RELA	Provide control at scene of accident Conduct investigation Facilitate communication
<b>Warning and alert</b>	Malaysian Meteorological Service Department of Environment Geological Survey Department Malaysian Centre for Remote Sensing Forestry Department	Detection of risk areas Forecasting and warning on weather Monitoring and alerts on environments

**Figure 1. The Malaysian Disaster Management Organization**

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.

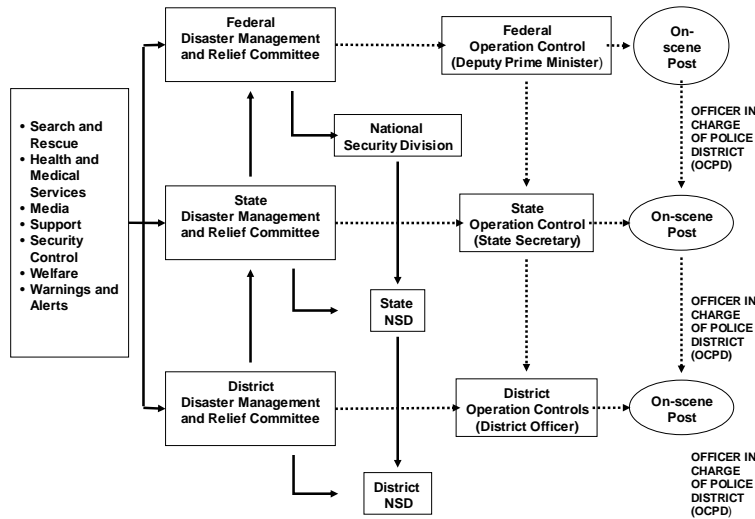


FIGURE 2. MECHANISM AND MACHINERY IN HANDLING DISASTER

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. The Director of Internal Security and Public Order, Royal Malaysia Police (PDRM) and Deputy Chief Director of operation, JBPM respectively will be the commander and deputy commander of disaster operation. To ensure the efficiency in the management of disaster, the Control Post on Scene (PKTK) and Disaster Operation Controlling Centre (PKOB) is established.

**Roles and Profiles of ERT**

In addition to the above mention directive for deployment of ERT in emergency situation there is the “Occupational Safety and Health Act (OSHA) 1994, this specific act which deal with the safety at the workplace is”. The regulatory proviso for setting up of ERT under the OSHA 1994 in the organisation which is implied and written is institute in:

- a. Part IV, Section 15, OSHA 1994.
- b. OSHA 1994, Occupational Safety and Health (Control of Industrial Major Accident Hazards) Regulation 1996.

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<sup>8</sup>.

Most business entity in Perlis with example which are in the Electricity, Gas, Water and Sanitary Services Sectors and the Manufacturing Sector such as Perlis Power Plant Berhad, Perlis Cement Berhad, Perlis Plantation Berhad and etcetera have their own in house ERT. These ERT was established and trained to meet their internal needs of the business entity such as:

- a. Natural Disasters such as Earthquakes, Floods/Mudslides or Wild Fires
- b. Violence such as Terrorism and Riots at workplace.
- c. Industrial Emergencies such as Chemical Spillages or, Power Outages.
- d. Workplace Accident such as On job injuries or Health and Medical

These business organizations carry out training from time to time in their premises on emergency drills internally either taking place on their own or with cooperation of government agencies such as Fire and Rescue Department, Police, RELA and Civil Defense Department and The Red Crescent Society. 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. Though the employment of ERT has limitation but their contribution in emergency situations is immense as will be illustrate beneath. The other regulatory requirement which ERT must take cognize of is:

- a. Fire Services Act and Regulation 1998 (Act 341)
- b. Akta Petroleum (Langkah-langkah Keselamatan) 1984
- c. Akta Bekalan Gas 1993.

### **Disaster Scenarios Handle by ERT**

There was a tragedy whereby, hundreds of factory workers from Atlas Edible Ice (Penang) Sdn Bhd., an ice processing factory located in Nagasari Light Industrial Estate, Kedah were evacuated when ammonia gas was detected to be leaked from a cylinder. However, there was no casualty reported. The ERT was deployed to Prai Fire and Rescue Department Station Assistant Superintendent Azelan Hassan said that both two Hazardous Material (HAZMAT) Teams, a team from Prai while the other one was from Perak Road together with the two fire engines from Prai and Butterworth were deployed soon after the department

---

<sup>8</sup> Occupational Safety and Health for Technologists, Engineers and Managers, David L. Goetsch, Pearson Prentice Hall, Fifth Edition, 2005, Page 350.



received an emergency call. The teams were then cordoned off the area after evacuating the workers from the five factories. The HAZMAT personnel later located that the leaking was from an ammonia gas cylinder weighing of 300 kilograms. However, the workers were allowed to return to their workplace after the area was declared safe at 11.30am<sup>9</sup>

There was another incident where the quick, swift and responsive action of the ERT was able to avert a major disaster from happening. On 19 November 2007 two crude oil storage tanks belonging to Shell Malaysia oil refinery in Port Dickson of its 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, Seremban 2, 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<sup>10</sup>.

### 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.

**Emergency team averts disaster at oil refinery**

By Ridzwan Abdullah  
news@rst.com.my

PORT DICKSON: A major blaze was averted at the Shell Malaysia oil refinery here when two of its crude oil storage tanks were struck by lightning and caught fire yesterday.

Fortunately, quick action by the Fire and Rescue Department and Shell's emergency response team (ERT) prevented what could have been a major disaster in the area.

There were no casualties reported.

The last fire reported at the refinery was in 1964.

When the fire broke out, there were initial fears of a re-ignition of the Petronas fuel tank farm blaze at the Johor Port in April last year, when one tank exploded and five others caught fire soon after.

The refinery at Port Dickson produces a comprehensive range of petroleum products, most of which are marketed in Malaysia.

Shell Malaysia, in a statement, said at 6.49am, the rim seals on two of its crude oil storage tanks caught fire.

The *New Straits Times* learnt that this happened when they were struck by lightning during a thunderstorm.

"Our emergency response team was immediately deployed on-site to control the situation," the statement issued by Shell Refining Company (FOM) Berhad said.

Workers gather outside the Shell Malaysia oil refinery after two of its crude oil storage tanks were struck by lightning and caught fire yesterday. (Inset) Smoke coming from one of the storage tanks.

They were soon joined by firemen from the Fire and Rescue Department, who managed to put out the fire at one of the tanks within an hour.

The fire at the second tank was extinguished by 10.30am.

Shell said the "crude oil stored in both tanks were not 'compromised' and there was minimal damage to the tanks.

As at 3pm, operations at the plant was in the process of being restarted.

The company said all the relevant government authorities, including the Department of Environment, have been informed of the incident.

"We will continue to extend our fullest co-operation to the authorities, to assess the impact of the incident, and to investigate the cause."

State Fire and Rescue Department director Zamri Che Din said 52 firemen from the Seremban, Seremban 2, Port Dickson, Telok Kemang, Senawang and Rantau stations were deployed to the scene at 7.06am.

They were assisted by the ERT teams from Shell and ESSO.

Led by Superintendent Khairul Azwan Ibrahim, the firemen controlled the fire by 8.08am and doused it completely at 10.50am.

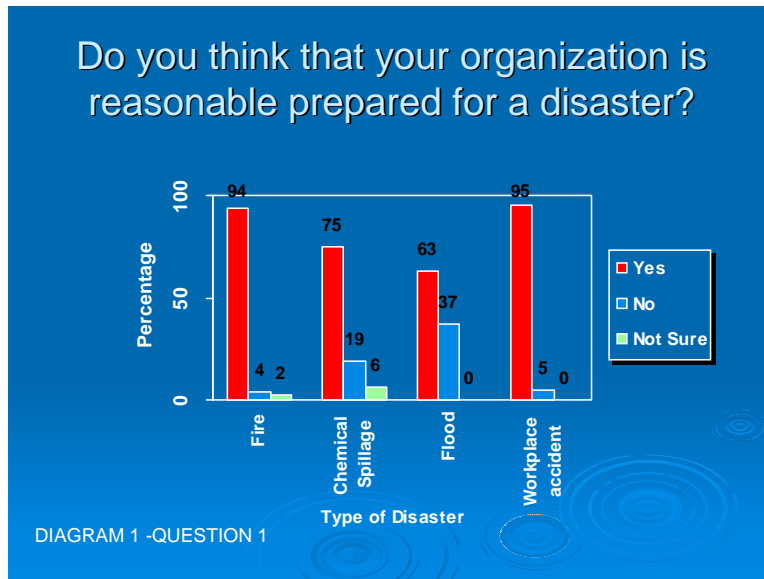
State DOE director Bahard Hussain, when contacted, said a team of officers were immediately sent to the refinery to assess the situation.

"Our major concern was the likelihood of an oil spill, but fortunately there was none."

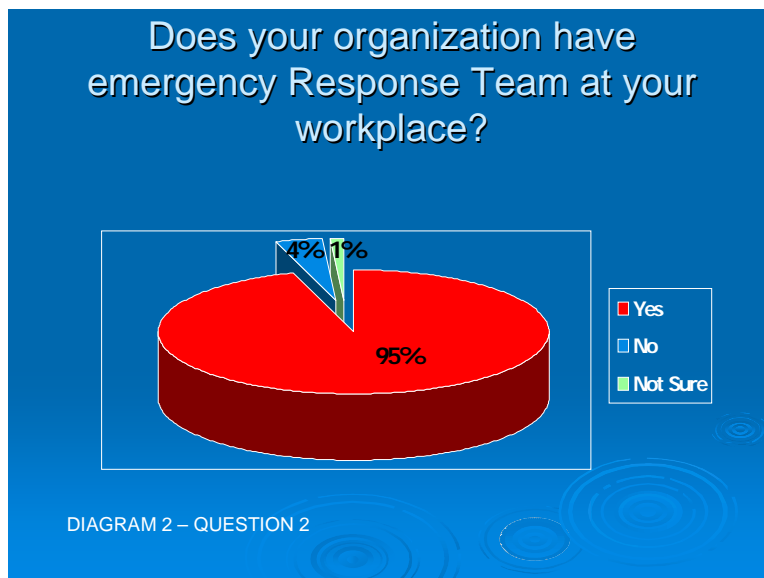
<sup>9</sup> The Sun, 1<sup>st</sup> January 2006.

<sup>10</sup> New Straits Times, 20 November 2007, Ridzwan Abdullah

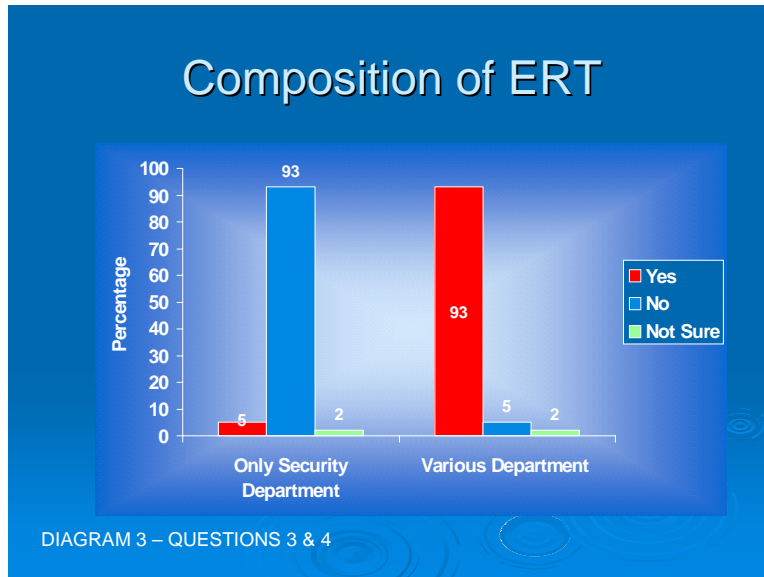
A quick random survey is made on 100 selected employees comprising from the various manufacturing companies in Perlis and Kedah using Questionnaires at **Appendix 1**. Simple frequency distribution was used to analyze the data collected. The objective of the survey is to ascertain the emergency preparedness of the ERT and the organizations involving in hazardous materials accident. The detailed result of the survey is at **Appendix 2**. The analysis of the survey is explained forthwith.



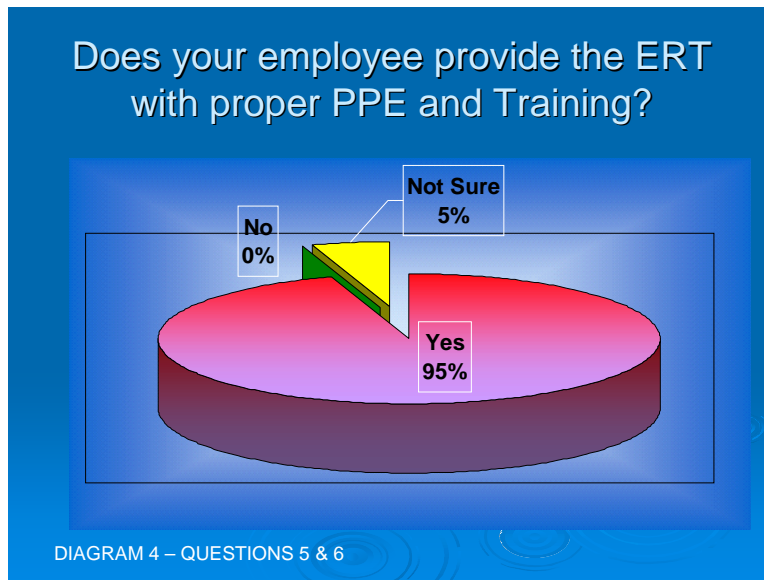
At the site of disaster in a business entity, such happening can be handled by the ERT as a first responder while waiting for the relevant assistance. From the random survey at Diagram 1, the respondents indicate that the organization or their place of work is prepared if a disaster happen. The respondents also indicate that the type of disaster their workplace is prepared is workplace accidents followed by fire and chemical spillage.



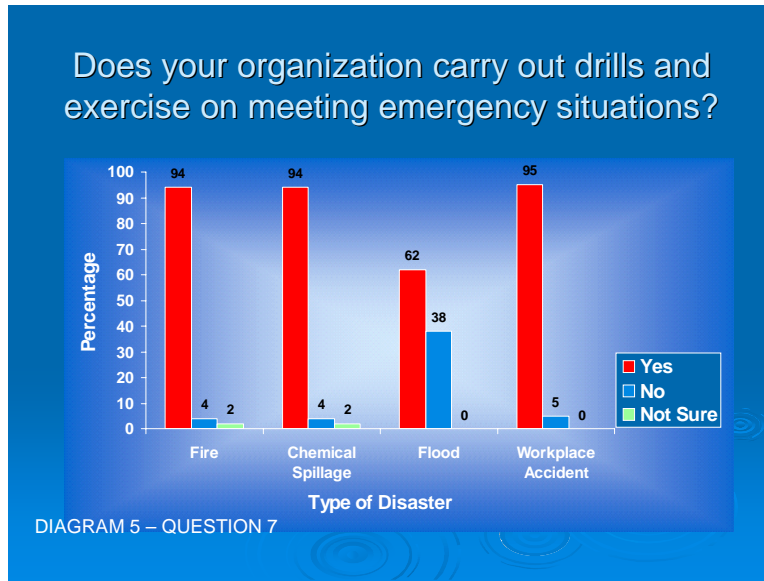
From the random survey at Diagram 2, the respondents indicate that ERT is established by the management at their workplace.



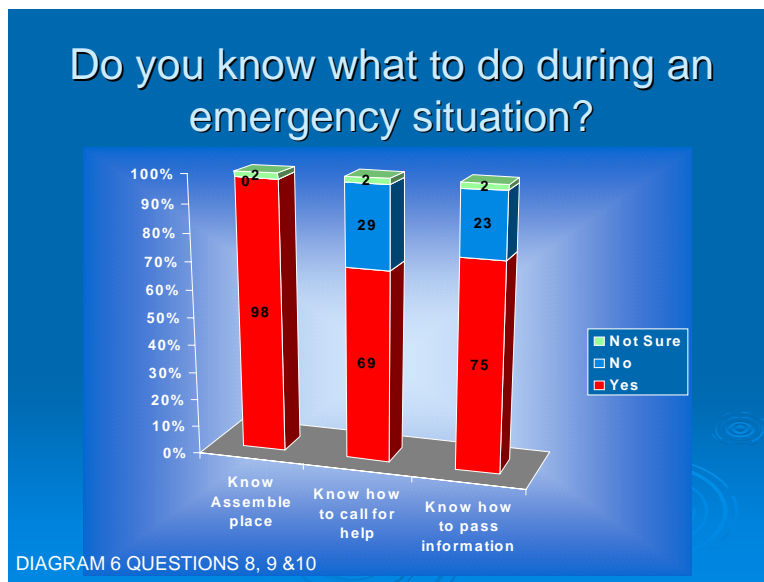
The respondents at Diagram 3 indicate that the composition of the ERT does not only consist of personnel from the Security Department but it is made up of volunteers from the various departments found in the business entity.



The survey at Diagram 4 also established that the ERT are provided with the necessary Personnel Protective Equipment (PPE) and they are trained to handle emergency situations. From the random survey it was established that business entities institute the ERT to meet their internal needs i.e. Industrial Emergencies or Workplace Accident such as chemical spillages, fires, on job injuries and etcetera.



The survey on respondents as at Diagram 5 indicate 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 work place accidents followed by fire and chemical spillage.

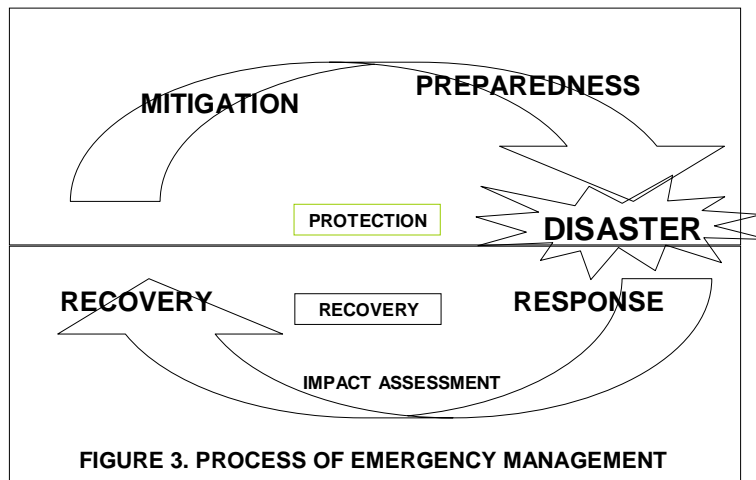


From the survey at Diagram 6, it was found that most of the respondents indicate that they are aware of the rendezvous or where to assemble in emergency situations and that most respondent indicate that they are aware of the process of alerting on site personnel during emergency situations. The respondents indicate they know how to pass relevant informations during emergency situations

It is concluded that business entity establish ERT in their organizations. The business entities are also prepared to meet any disaster situation which occurs at their premises.

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 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 as shown in **Figure 2** involve 4 phases: **Mitigation, Preparedness, Response and Recovery**. 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 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 advised that in an emergency response, both the individual responders and their organizations ought to avoid performing tasks 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 exercises 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 function efficiently during an actual emergency. The end results of drills and exercises 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.

On 23 March 2006, Perlis Power Plant Sdn. Bhd conducted a full scale exercise in handling hazardous materials accident. The scenario is, there is a gas leak in one of the plant. The gas leakage cause explosion and fire broke out. The business entity activates its emergency response plan. The Royal Malaysian Police from

Kangar Station, Fire and Rescue Department Malaysia Kangar Station, Red Crescent Society from University Malaysia Perlis took part in the exercise. The exercise was successfully conducted. Many lessons were learned by Perlis Power Plant Sdn Berhad from the combine exercise. Some of the lessons learned are as mention aforesaid.

### 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.



FULL SCALE DRILLS AND EXERCISES CONDUCTED BY PERLIS POWER PLANT SDN. BHD. ON 23 MARCH 2006 CONSIST OF THE ERT, THE ROYAL MALAYSIAN POLICE, THE FIRE AND RESCUE DEPARTMENT, RED CRESENT SOCIETY FROM UNIVERSITI MALAYSIA PERLIS (UniMAP)

- 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 activated. 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



Picture 1- HazMat Suit Worn by ERT Perlis Power Plant Sdn. Bhd (Green Colour) and personnel from Fire & Rescue Department Malaysia during Mock Exercise on 23 March 2006

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. A HazMat Suit combined with breathing apparatus, as shown in **Picture 1** is a fully encapsulating garment worn as protection from hazardous materials. 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<sup>11</sup>.

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

<sup>11</sup> Guidelines on the Use of Personal Protective Equipment Against Chemicals Hazards, Department of Occupational Safety and Health, Ministry of Human Resources, 2005, Page 14

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**

### **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 the following:

- Hazard Mitigation (HAZMIT) Plans & Teams
- Hazard Identification
- Risk Analysis
- Evaluation
- Research
- Education

### **Recommendations**

With reference to exploratory study on the emergency preparedness of ERT in managing 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.

## **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. To ensure safety and health at workplace it is essential that there be a strong employer commitment and strong worker participation. It is also the responsibility of the employer to provide proper safety equipment to his employee to enable his employee to undertake the assign tasks.

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. In the case of hazardous materials accidents the lead agency 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

**References:**

1. National Security Council Directive No. 20: POLICY AND MECHANISM OF DISASTER MANAGEMENT AND RELIEF COMMITTEE
2. The Complete Disaster Home Preparation Guide, Robert A. Roskind, Prentice Hall PTR, 2000
3. Disasters, Development and Environment, Edited by Ann Yarley University College, London, U.K., John Wiley & Sons, 1994.
4. Emergency and Disaster Planning Manual, Laura G. Kaplan, B.S.E.E., McGraw-Hill, 1996.
5. David L. Goetsch, Occupational Safety and Health for Technologists, Engineers, and Managers (Fifth Edition), Pearson Prentice Hall: 2005.
6. Robert Kreiner, Angelo Kinicki, Organizational Behavior (Sixth Edition), McGraw Hill/Irwin 200
7. Mohamad Khan, Nor Azimah Chew Abdullah & Ab. Aziz Yusof, Keselamatan dan Kesihatan Pekerjaan dalam Organisasi, Pearson Prentice Hall : 2005
8. Charles D. Reese, Occupational Safety and Health Management: A Practical Approach, Lewis Publishers: 2003.

**QUESTIONNAIRES**

**TITLE:**

**EMERGENCY PREPAREDNESS AMONGST EMERGENCY  
RESPONSE TEAM IN MANAGING ACCIDENTS AT THE  
WORKPLACE INVOLVING HAZARDOUS MATERIALS**

**SPONSORED BY:**

**UNIVERSITY MALAYSIA PERLIS  
(UniMAP)**

**FOR FURTHER INFORMATION: PLEASE CONTACT  
LT. KOL. (B) AZUDDIN BIN BAHARI  
TELEPHONE NO: 012 4335060**

**EMERGENCY PREPAREDNESS AMONGST EMERGENCY RESPONSE  
TEAM QUESTIONNAIRE**

<b>Please mark with "X" in the <input type="checkbox"/> if the statement is appropriate.</b>				
<b>No</b>	<b>Questions</b>	<b>YES</b>	<b>NO</b>	<b>NOT SURE</b>
1.	Do you think that your organization is reasonably prepared for a disaster such as an a. Fire b. chemical spillage c. flood d. workplace accidents	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2	Does your organization have Emergency Response Team at your workplace?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Is your Emergency Response Team at your workplace consisting of personnel from Security Department only?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Is your Emergency Response Team at your workplace consisting of volunteers from various department?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Does your employer provide the ERT with a proper PPE for protection during emergency situations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Does your employer provide training for the ERT personnel when you are recruited?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Does your organization carry out drills and exercise on meeting emergency situations such as: a. fire b. chemical spillage c. flood d. workplace accidents	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
8	Have you been told where to meet (rendezvous) outside our workplace in case of an emergency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Do you know how to call for help during an emergency situation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Do you know how to pass information to the relevant authorities if you witnessed any disaster or accident happening at your workplace?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 2

**EMERGENCY PREPAREDNESS AMONGST EMERGENCY RESPONSE  
TEAM QUESTIONNAIRE  
N 100**

Please mark with "X" in the <input type="checkbox"/> if the statement is appropriate.				
No	Questions	YES	NO	NOT SURE
1.	Do you think that your organization is reasonably prepared for a disaster such as an a. Fire b. chemical spillage c. flood d. workplace accidents	94 75 63 95	4 19 37 5	2 6 0 0
2	Does your organization have Emergency Response Team at your workplace?	95	4	1
3	Is your Emergency Response Team at your workplace consisting of personnel from Security Department only?	93	5	2
4	Is your Emergency Response Team at your workplace consisting of volunteers from various department?	93	5	2
5	Does your employer provide the ERT with a proper PPE for protection during emergency situations?	95	0	5
6	Does your employer provide training for the ERT personnel when you are recruited?	95	0	5
7	Does your organization carry out drills and exercise on meeting emergency situations such as: a. fire b. chemical spillage c. flood d. workplace accidents	94 94 62 95	4 4 38 5	2 2 0 0
8	Have you been told where to meet (rendezvous) outside our workplace in case of an emergency?	98	0	2
9	Do you know how to call for help during an emergency situation?	69	29	2
10	Do you know how to pass information to the relevant authorities if you witnessed any disaster or accident happening at your workplace?	75	23	2