

**Preparation of  
ON-SITE and OFF-SITE  
Emergency plans**

# Statutory Provision

- Under Section 41(B) (4) every occupier is to prepare On-site Emergency Plan and detailed disaster control measures for his factory. Again under provision of Rule 13 of the Manufacture, Storage and Import of Hazardous Chemicals Rules 1989, the occupier shall prepare and keep up to date On-site Emergency plan containing details how major accidents will be dealt with on the site on which the industrial activity is carried on and that plan shall include the name of the persons who is responsible for safety on the site and names of those who are authorized to take action in accordance with the plan in case of emergency.

# Emergency :

- is one, which has the potential to cause serious injury or loss of life or environment disruption.
- It may cause extensive damage to property and serious disruption, both inside and outside the works.
- It would require the assistance of emergency services to handle it effectively.
- Normal patterns of life is disrupted.

# Causes of emergency

- NATURE : earthquake, droughts, floods, etc
- VIOLENCE : war, armed conflict, sabotage, etc
- DETERIORATION : environment degradation, etc
- FAILURES: equipment, plant, fire, leakage ,etc
- This will result in fire ,explosion or toxic release.

# TYPES OF EMERGENCY PLANS :

- **On-site plan** : This will be the responsibility of the works management to formulate it. Plan must therefore be specific to the site.
- **Off-site plan** : This will be the responsibility of district emergency authority to integrate plans. Plan must therefore be specific to the area.

# OBJECTIVES OF EMERGENCY PLANS

- To localise the emergency, and if possible to eliminate it.
- To minimize the effects on people, property and environment.
- Minimising the effects may include rescue, first aid, evacuation, rehabilitation and prompt communication to people living nearby

**FACTORS TO BE CONSIDERED**

Three factors have to be taken into consideration in formulating the plan either for On-site or Off-site.

This can be termed as safety continuum. The three factors are:

**1. Prevention**

**a. Anticipation   b. Analysis   c. Scenarios   d. Engineering and Design.**

**2. Preparedness**

**a. Policy   b. Procedures   c. Performance   d. Practice.**

**3. Response**

**a. Reaction to an incident   b. Critique of incident**

# AGENCIES INVOLVED

- 1. INDUSTRY
- 2. GOVERNMENT
- 3. PUBLIC



# ON-SITE EMERGENCY PLAN

1. Assessment of the size and nature of the events foreseen and the probability of their occurrence:
2. Formulation of the plan and liaison with outside authorities, including the emergency services:
3. Procedures:
  - (i) Raising the alarm
  - (ii) Communications both within and outside the works:
4. Appointment of key personnel and their duties and responsibilities:
  - (i) Works incident controller
  - (ii) Works main controller
5. Emergency control centre
6. Action on site;      7. Action off site.

# OFF-SITE EMERGENCY PLAN

- Is an integral part of any major hazard control system.
- Based on those accidents, which could affect people and the environment outside the works.
- Based on those events which are most likely to occur.
- A good off-site emergency plan has the flexibility in its application to emergencies other than those specifically included in the formation of the plan.

# Main elements of On-site Emergency plans

- Leadership and Administration.
- Role and Responsibilities of Key Personnel.
- Emergency action.
- Light and Power.
- Source of energy control.
- Protective and rescue equipment.
- Communication.
- Medical care.
- Mutual Aid.
- Public relation.
- Protection of vital records.
- Training.
- Periodical revision of plan.

# Emergency Control Centre

- i. Internal and external communication.
- ii. Computer and other essential records.
- iii. Daily attendance of workmen employed in factory.
- iv. Storage of hazardous material records and manufacturing records.
- v. Pollution records.
- vi. Walky-talky.

# Emergency Control Centre

- vii. Plan of the plant showing:-
  - a. Storage area of hazardous materials.
  - b. Storage of safety equipments.
  - c. Fire fighting system and additional source of water.
  - d. Site entrance, roadway and emergency exist.
  - e. Assembly points.
  - f. Truck parking area.
  - g. Surrounding location.
- viii. Note Book, Pad and Pencil.
- ix. List of Key Personnel with addresses, telephone number etc.

# Assembly Points

- A safe place far away from the plant should be pre determined as assembly point where in case of emergency personnel evacuated from the affected areas are to be assembled. The plant workers, contract workers and visitors should assemble in assembly point in case of emergency and the time office clerk should take their attendance so as to assess the missing persons during emergency.

# The Key Personnel for onsite emergency

- **The Key Personnel for onsite emergency:-**
- 1. Works Main Controller.
- 2. Works Incident Controller.
- 3. Other Key Officers
  - a. Communication Officer.
  - b. Security and Fire Officer.
  - c. Telephone Operators.
  - d. Medical Officer.
  - e. Personnel/Administrative Officer.
  - f. Essential work team leaders.

# Works Main Controller

- **Assess the magnitude of the situation and decide whether the evacuation of staff from the plant is needed.**
- **Exercise and direct operational control over areas other than those affected.**
- **Maintain a continuous review of possible development and assess in consultation with work incident controller and other Key Personnel.**
- **Liaison with Police, Fire Service, Medical Services, Factory Inspectorate and other Govt. Agencies.**
- **Direct and control rehabilitation of affected area after emergency.**
- **Intimate Off-site Emergency controller if the emergency spreads beyond the factory premises and likely to affect the surrounding area.**
- **Ensure that evidence is preserved for enquiries to be conducted by statutory authorities.**
- **The Works Main Controller will declare the emergency**



# Work Incident Controller

- He will rush to the place of occurrence and take overall charge and report to the Works Main Controller .
- He will assess the situation and considering the magnitude of emergency he will take decision and inform Communication Officer to communicate the news of emergency to different agencies.
- He will give direction to stop all operations within the affected area and evacuation of workers and staffs from affected area.
- He will inform all Key Personnel and all outside agency for help.

# Other Key Personnel and their duties

- *a. Communication Officer.*
- On hearing the emergency siren/alarm he will proceed to the control center and communicate to Work Incident Controller. He will collect information from the emergency affected area and send correct message to work main controller for declaration of emergency. He will maintain a log book of incident. He will contact all essential departments. He will take stock of the meteorological condition from local meteorological Department. He will communicate all information as directed by Works Main Controller.

- ***b. Security and Fire Officer.***
- ***The Security or Fire officer will be responsible for the fire fighting. On hearing the emergency alarm/siren, he will reach the incident area with fire and security staff.***
- ***He will inform to the Work Incident Controller about the situation and requirement of outside help like State Fire Service and other mutual aid members.***
- ***At the site, the entire fire squad member will respond to the advice and information given by the works incident controller.***
- ***The security will control the visitors and the vehicle entry.***

- *c. Telephone Operator.*
- *In case of fire is discovered but no emergency siren is operated, he shall ensure the information about the location of the fire/emergency incident from the persons discovered/notices the above and communicate to different Key Personnel immediately with clear message.*

- ***d. Medical Officer.***
- ***Medical Officer with his team will report to the Works Incident Controller on hearing the fire/emergency siren immediately.***
- ***The ambulance will be parked nearest to the site of incident.***
- ***Name of injured and other casualties carried to the Hospital will be recorded and handed over to Works Incident Controller.***
- ***The ambulance will carry the injured to the nearest hospital for treatment.***

## • **e. Personnel/Administrative Officer**

- *Manning of assembly points to record the arrival of evacuated people.*
- *He should work as a liaison officer liaising with works main controller and other essential departments such as Police, Press and Statutory authorities. His responsibilities shall include:-*
- *To ensure that casualties receive adequate attention to arrange additional help if required and inform relatives.*
- *To control traffic movement into the factory and ensure that alternative transport is available when needed.*
- *When emergency is prolonged, arrange for the relief of personnel and organize refreshment and catering facilities.*
- *Arrange for finance for the expenditure to handle the emergency.*

## *f. Essential Works and Team Leaders.*

1. Task Force and repair team.
2. Fire fighting team.
3. Communication team.
4. Security Team.
5. Transport Team.
6. First aid and medical team.
- 7. Safety team.

# Alarm System

- Alarm system varies and will depend on the size of the works area –
- simple fire bell,
- hand operated siren –
- break open type,
- fire alarm etc.
- Automatic alarm may be needed for highly hazardous nature of plant.



# Communication System

- Communication is a key component to control an emergency. The following communication system may be provided in the plant-
- ☐ Walky-Talky.
- ☐ Telephone (internal & external).
- ☐ Cell phone.
- ☐ Intercom/paging.
- ☐ Runners (verbal or written messages).

# Siren for Emergency

- Siren for emergency should be different from the normal siren.
- The emergency siren should be audible to a distance of 5 KM radius.
- The emergency siren should be used only in case of emergency.

# Escape Route

- The escape route from each and every plant should be clearly marked.
- The escape route is the shortest route to reach out of the plant area to open area, which leads to assembly point.
- This route should be indicated on the layout plan attached to the On-site Emergency Plan.

# On-site Emergency Plan should

## contain-

- 1. Site plan and topographic plan.
- 2. Plan showing the fire fighting facilities.
- 3. Plan showing hazardous material storage area.
- 4. Material safety data sheets for hazardous chemicals.
- 5. Facilities available in main control center.
- 6. List of emergency equipment.
- 7. List of Safety Equipment.
- 8. List of important telephone numbers and addresses.
  - i. Nearest hospitals and ambulance service center.
  - ii. Nearest fire station.
  - iii. Govt. Officials.
  - iv. Transport provider.
- 9. Names and address & contact telephone number of Key Personnel.

# Emergency facilities

- i. Fire protection and fire fighting facilities.
- ii. Emergency lighting and standby power.
- iii. Emergency equipment and rescue equipment :-
  - a. Breathing apparatus with compressed air cylinder.
  - b. Fire proximity suit.
  - c. Resuscitator.
  - d. Water gel Blanket.
  - e. Low temperature suit.
  - f. First aid kit.
  - g. Stretchers.
  - h. Torches.
  - i. Ladders.

- iv. Safety Equipment:-
  - a. Respirators.
  - b. Gum boots.
  - c. Safety helmets.
  - d. Asbestos Rubber hand gloves.
  - e. Goggles and face shield.
  - f. Toxic gas measuring instruments.
  - g. Explosive meter.
  - h. Oxygen measuring instruments.
  - i. Toxic gas measuring instrument.
  - j. Wind direction indicator



***TYPICAL  
COMPONENTS OF  
EMERGENCY  
RESPONSE PLAN***

# 1. Plant Emergency Organization

- Designated person in charge / alternates
- Functions of each key individual and group.
- Telephone numbers (Office and home ) for key people/alternates



## 2.Plant Risk Evaluation

- Quantity of hazardous materials
- Location of hazardous materials
- Properties of each (MSDS sheets)
- Location of isolation valves
- Special fire fighting procedures (if any)
- Special handling requirements.

# 3. Notification Procedures and Communications Systems

- Alarm systems
- Communication equipment (radios, hot lines, etc.,)
- Emergency organization
- Plant management
- Local officials and response agencies
- Neighboring industry
- Nearby residents
- Names and telephone number (with alternates) list
- Designated person for media contacts
- Procedure for notifying families of injured employees
- Central reporting office

## 4. Area Risk Evaluation (other industries near plant)

- Properties of hazards materials at nearby plants.
- Contacts (names, telephone numbers) at other sites
- Established procedures for notification of chemical releases at other sites in area.

# 5. Emergency Equipment and Facilities

- Fire fighting equipment
- Emergency medical supplies
- Toxic gas detectors (Where needed)
- Wind direction / speed indicators
- Self-contained breathing apparatus
- Protective Clothing

## 6. Procedure for returning to normal operations

- Interface and lines of communications with offsite officials

## 7. Training and Drills

- Knowledge of chemicals (Properties, toxicity, etc.,)
- Procedures for reporting emergencies
- Knowledge of alarms systems
- Location of fire fighting equipment
- Use of fire fighting equipment
- Use of protective equipment (respirators, breathing air, clothing etc.)
- Decontamination procedures for protective clothing and equipment.
- Evacuation procedures
- Frequent, documented simulated emergencies.

# organization / Procedures

- Simulated emergencies
- Documented, frequent alarms systems checks
- Frequent tests of fire fighting equipment
- Evacuation practice
- On-going emergency preparedness committee

## 9. Plan Updates

- Annual or more frequent if needed
- Reflect results or drills and tests



# Procedures

- Communications
- Evacuation
- Medical (Include handling of multiple injuries)
- Special procedures for toxic gas releases (Chlorine, etc.)
- Hurricane procedures (coastal area only)
- Utility failure procedures
- Individual unit emergency procedures
- Bomb threat procedures

# (for each process unit and utility systems)

- **Start-up / Shut-down emergency procedures**
- **Analysis of potential incidents**
- **Emergency response and action to be taken for each incident.**

# 12. DEGREE OF EMERGENCY AND RESPONSE

- **Material Related :** Size of Release
- Physical State of Released Chemical
- Chemical Toxicity
- **Community Related: Geographical** and Meteorological Conditions
- Population Centers and Distribution
- Environmental Targets
- Physical Facilities
- Response Resources
- Established Plans and Preparedness

# COMMUNICATION / NOTIFICATION

**OFF-SITE EMERGENCY**  
The Works Emergency Controller of the Industry, where the emergency has occurred, will decide to inform the District Emergency Authority on the 'Off-site Emergency Situation' if the On-site emergency is likely to develop into an off-site emergency.

- He will first inform the police station as appropriate about the 'Off-site emergency'. The police station through the wireless set will inform the District Collector's Office. The industry will also directly try to inform the District Collector or his office, the DSP and SP, about the Off-site Emergency situation.
- The Collector (District Emergency Authority) will assume the role of Chief Off-site Emergency Co-coordinator / Mobilize all the agencies under his control, for rushing to the spot to perform the jobs as laid down in Off-site Emergency Plan.

# OFF-SITE EMERGENCY PLAN - PART –I

## (Individual Industries)

- Site location – roads / railway stations
- Brief details of manufacturing processes and materials handled.
- Hazard potential
- Basic control system and communications
- Material Safety data sheets of important hazardous chemicals handled.
- Responsibilities and duties of key personnel.

# OFF-SITE EMERGENCY PLAN - PART-II

## (Common Off-site Emergency Plan)

- Sectorial division of emergency planning zone (Direction / distance / Sectors giving details of villages & approximate population)
- Emergency committees
- Notification of Off-site emergency
- Responsibilities and duties of Govt. and other agencies.
- Annexures containing details of Telephone numbers, contact addresses safety professionals of the area, Medical facilities etc.,

# EMERGENCY PREPAREDNESS - IMPORTANT POINTS

- *EMERGENCY PLANS* are not static documents. They need updating.
- Must be constructed within the framework of available or obtainable resources.
- Must represent all interest groups.
- Must be supported by the community to assure their success.