Guidelines for the Preparation of an On-Site Emergency Plan

Introduction:

As fallout of the Bhopal Gas Disaster, the Factories Act has been amended introducing a new chapter i.e. Chapter IVA – Provision relating to hazardous processes to the Factories Act with addition of new provisions such as Section 41A, 41B, 41C, 41D, 41E, 41G and 41H covering all the hazardous process industries. Under the provision of Section 41B (4) of the Factories Act, 1948, every occupier of a factory shall, with the approval of the Chief Inspector of Factories draw up an On-site Emergency Plan and detailed disaster control measures for his factory, and make known to the workers employed therein and to the general public living in the vicinity of the factory, the safety measures required to be taken in the event of an accident taking place.

Major accidents may cause emergency and it may lead to disaster, which may cause heavy damage to plant, injury to persons and create adverse effects on the environment. Emergency situation may arise all of a sudden and create havoc and cause extensive damage to the property, environment and harm to human beings. Therefore, such situations and risks should be thought, visualized and assessed in advance and it should be planned beforehand to tackle them immediately and control them within the shortest time.

What is Emergency?

A major emergency can be defined as an accident/incident that has potential to cause serious injuries or loss of life. It may cause extensive damage to property, serious disruption both in production and working of the factory and may cause adverse effect on the environment.

On-Site Emergency:

If an accident/incident takes place in a factory, and its effects are confined to the factory premises only, involving only the persons working in the factory and the property inside the factory, it may be called an On-site Emergency.

Off-Site Emergency;

If the accident is such that, its effects inside the factory are uncontrollable and it may spread outside the factory premises, it is called as Off-site Emergency.

Why Emergency Plan?

The main objectives of an emergency plan are:-

a. to control and contain the incident/accident and if possible, eliminate it; and
b. to minimize the effects of the incident on persons, property and environment.
c. to identify and utilize the resources available including the mutual aid
d. to extend medical support to the affected by identifying the hospitals with proper required treatment facilities.

Each factory carrying out hazardous process shall prepare an emergency plan incorporating details of action to be taken in case of any major accident/disaster occurring inside the factory. The plan should cover all types of major accident/occurrences and the identified risk in the plant. Mock drills on the plan should be carried out periodically to make the plan foolproof and persons are made fully aware and are prepared to handle any kind of incident in the plant.

On-Site Emergency Plan - Statutory Provision;

After the Bhopal gas tragedy (1984) and Supreme Court direction in case of M. C. Mehta & Anr. Vs Union of India & Ors., the Govt. of India has made some important amendments to the Factories Act 1948 in the year 1987 with incorporation of special provisions relating to hazardous process. 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 Major Accident Hazards Control Karnataka Rules, 1994, 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.

Preparation of On-site Emergency Plan by the occupier is mandatory. The occupier shall ensure a mock drill of the on-site emergency plan is conducted at least one in every six months. A detailed report of the mock drill conducted under rule shall be made immediately available to the Inspector and Chief Inspector.

Main elements of On-Site Emergency plan;

The main elements of on-site emergency plans are:-

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

Emergency Action Plan for On-Site Emergency Plan;

The Action Plan should consist of the following:-

Designated Emergency Control Centre/Room - This is the main centre from where the operations to handle the emergency are directed and co-ordinated.

The main facilities to be made available in the emergency control are:-

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.
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.

The Key Personnel for On-Site emergency:-

1. Site Controller/Declarer of Emergency.
2. Incident Controller/Controller of Emergency.
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.

Site Controller/Declarer of Emergency;

The Plant Head should act as Site Controller. His duties are to:-

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

Incident Controller/Controller of Emergency;

He is the next responsible officer after the Site Controller. Generally the Production Manager is designated as Incident Controller. In case of emergency he will rush to the place of occurrence and take overall charge and report to the Site Controller by personnel communication system like cell phones or walky-talky and inform about the magnitude of emergency. He will assess the situation and considering the magnitude of emergency he will take decision and inform the Site Controller to communicate the news

of emergency to different agencies. He will give direction to stop all operations within the affected area. He will take the charge of Incident Controller and will order for shutdown and evacuation of workers and staffs from affected area. He will ensure that all non-essential workers/staff are evacuated to assembly point and areas searched for casualties. He will report all significant development to the Site Controller. Moreover he will advise to preserve evidence of emergency into the cause of emergency.

Other Key Personnel and their duties;

Communication Officer.

On hearing the emergency siren/alarm he will proceed to the control centre and communicate to Site Controller. He will collect information from the emergency affected area and send correct message to the Site Controller for declaration of emergency. He will maintain a log book of incident. He will contact all essential departments. He will communicate all information as directed by Works Main Controller.

The following communication system may be provided in the plant;
Walky-Talky. Telephone (internal & external). Cell phone.

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.

All non-essential staff should be evacuated from the emergency site. As soon as the emergency siren rings the workers have to shut down the plant and move to the assembly point. The plant shut down procedure in case of emergency should be prepared and kept ready and responsible persons should be nominated for the purpose.

Counting of Personnel;

All personnel working in the plant should be counted. Time office persons should collect the details of personnel arriving at the assembly point. These should be checked with the attendances of regular workers, contract workers present in the site on the day of emergency. The accident control should be informed and arrangement should be made for searching missing persons in the emergency affected area. The employees' address, contact number of next to kin should be maintained in the time office so that during emergency relatives of those affected due to emergency may be informed accordingly. Information in respect of emergency should be given to the media and other agency.

All Clear Signal;

After control of emergency the Incident Controller will communicate to the Site Controller about the cessation of emergency. The Site Controller can declare all clear by instructing the time office to sound "All Clear Sirens".

Mutual Aid System;

Mutual aid scheme should be introduced among industries so that in case of emergency necessary help from mutual aid partner may be extended. Essential elements of this scheme are:-

- o Mutual aid must be a written document signed by the Chief Executive of the industries concerned.
- o Specify key personnel who are authorized to give requisition of materials from other industries.
- o Specify the available quantity of material/equipment that can be spared.
- o Mode of requisition during emergency.

Mock drills on emergency planning should be conducted once in 6 months and sequence of events should be recorded for improvement of the exercise. Exercises on Onsite Emergency Planning should be monitored and the plan is reviewed every year.

Emergency facilities;

The following facilities should be provided in any factory to tackle any emergency at any time.

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.

On-Site Emergency Plan should contain the following data and shall be documented in a printed form.

Reference : 1. Section 2(cb) and Section 41B(4) of the Factories Act 1948
2. Rule 13 of CIMAH Rules, 1996

Sl. No	Content	Remarks Explanation/Example
1.	Profile of the company	Introduction about the company/group, finished products, area covered, location address etc.,
2.	Safety & Health Policy	Attach EHS policy signed by Occupier / Director / CEO
3.	Scope & objectives of On-site Emergency Plan	Brief on the scope and objectives shall be explained

4.	Consent / Licences obtained:	

Sl.No	Consent/ Licence	Yes / No / NA
1.	KSPCB- Air and Water	
2.	Hazardous Waste Management	
3.	Petroleum & Explosive Organization	
4.	Drugs Controller	
5.	OSHAS/ International Certification. if any?	
6.	Any other consent / licence obtained from statutory authorities	

5.	Brief description of the Manufacturing Process	Brief explanation with flow chart. If multiple products are manufactured, multiple flow charts shall be attached
6.	Equipment Used (Major Important & Critical) with their Capacity / Quantity / Hazards	Storage Tanks, Reactors, Distillation Column, Electrolytic bath, Kiln and such other equipment which can cause huge damage in case of failure shall be indicated.
7.	Working pattern and declared general holidays	Working Hours

Shifts	Hours	No. of workers working	No. of Visitors
General	8.30 AM to 6.20 PM		
I Shift	6.30 AM to 2.00 PM		
II Shift	2.30 PM to 10.00 PM		
III Shift	10.00 PM to 6.00 AM		

Weekly Holiday: Sunday
Declared General Holidays: List of declared NFH

8.	Organization Structure	How the organization works basically, the flow of command.
9.	Geographical Location	Google map with geo position data.

<table>
<tr><td>10.</td><td>Demography details</td><td>Population details especially density around the unit</td></tr>
<tr><td>11.</td><td>Meteorological data</td><td>To understand wind speeds, direction, rainfall, probability of lightning, and natural disasters.</td></tr>
<tr><td>12.</td><td>Wind details and direction</td><td>Wind rose diagram should be aligned with the site North for easy understanding.</td></tr>
<tr><td>13.</td><td>Details of raw materials used in the manufacturing.

Chemical data with their hazards

1. Names of Chemicals – Commercial / Technical Name / UN Number, CAS No.

2. Storage quantity.

3. Monthly consumption

4. Method of storage – above / below the ground level (Tank farm / Bullets / Spheres / Mounded, etc.)

5. Material Safety Data Sheet (attach in the form of annexure)</td><td>Furnish details of the raw materials & Finished Products
<table>
<tr><th>Sl. No.</th><th>Name of Chemicals</th><th>CAS No.</th><th>Description of the Hazard</th><th>Storage Quantity</th><th>Method of Storage</th></tr>
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<tr><td>14.</td><td>Identifications of Hazards (Leading To “On Site Emergency”) In each Department/Section through Risk Analysis with mitigation measures.</td><td>Based on the risk analysis and studies carried out, the following types of situations may result into disaster where emergency preparation is required.
• Fire Hazards/Burns
• Spillage of chemicals
• Environmental degradation
• Noise
• Overturning of Tankers carrying chemicals
• Electrical Shock
• The table showing Area of Operation, Identified Hazard, Precautions Taken, and Mitigation Measures in place.</td></tr>
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15.	Identifications of Hazards in the process which may lead to Accident followed by injuries	Identifications of Hazards in the process which may lead to Accident followed by injuries (other than the hazards leading to Onsite emergency in each Department through HIRA with mitigation measures ➢ Table showing Operations/ Work Activities / Services, OH&S Hazards, Category of hazard (OH/S), Risks, Control Measure (In place or Proposed), Mitigation Measures in place and Administrative Controls.
16.	Damage Criteria/Severity Zone Mapping	• Toxic Gas Leakage • Thermal Radiation • Chemical Spillage How much area will be covered and what will be the severity & consequence – How many people will get affected. Dispersion module details (using aloha or other software) shall be furnished wherever applicable
17.	Emergency Plan for Various Scenarios arising from natural calamities like floods, lightening, earthquake, bomb threat, food poisoning, etc., including any internal Corporate requirements	Explain what are action plan for such scenarios, other than Fire, gas & chemical leak, etc., which has been covered above
18.	Further Mitigation measures possessed	Co-ordination with neighbouring industries/public, local and district administration.
19.	Lightening arrestor	Provision made for providing lightening arrestor to cover the entire factory premises.

20.	Details of Safety Systems available in the factory;

Sl.No	Safety Systems	Provided (Yes / No / NA)	Capacity/Number
1.	Fire Hydrant System		
2.	Specific Fire Extinguishers		
3.	Fire tender / portable /mini truck mounted extinguishers		
4.	Details of SCBA		
5.	Flame proof electrical fittings		
6.	Wind sack arrangement		
7.	Dyke arrangements for tanks		
8.	Eye fountain / Overhead showers		
9.	Fire fighting trained persons		
10	First Aid trained persons		
11	Inhibitors (Neutralizing agents)		
12	Emergency siren system (automatic and manual)		
13	Leak detectors (Fixed & portable)		
14	Fire suits		
15	Gel blankets (in case of burns)		
16	Electrical Safety suits / jacket for electrical works		
17	Surge protection devices (electrical, flow control etc.,)		
18	Battery operated public address system / megaphone		

21.	Emergency Shutting down procedure	Should be simple and easy to understand so that it can be practised during mock drills.
22.	Identification of Mutual Aid Partners Facility nearby for support – Public & Private	• List of nearby Industries who can help you in case of emergency with the name of the company, Contact Person & Phone Number. • What are the facilities available around your company including

		your neighbouring industry to help you in case of emergency in your company and within how much time they can help you
23.	Identifications of resource suppliers (both public and private)	List of resource suppliers for Fire extinguishers, SCBA, Detectors, PPE / earth moving equipment etc., with their address & Phone number
24.	Emergency Transport facility & procedure	1. Details of Ambulance Van if available (Otherwise indicate the arrangement made to procure the same at the shortest time). 2. Details of vehicles available with the organisation. 3. External agencies identified with the details of vehicles.
25.	Medical emergency response plan including arrangements for medical treatment. Include list of Hospitals, address and contact details	➢ Based on the hazard identified in your factory details of the hospital nearby. Ex: Identified hospital for toxic gas release/ burn injuries/ skin absorption/ gas inhalation etc. ➢ Understanding signed with hospital regarding providing emergency service ➢ Involvement of identified hospital authorities during mock drill
26.	Emergency Control Centre/ Control room facilities & Tel. No. s of all Agencies- External, Govt.& Public	Details to be available for use during emergency (list to be provided).

		Control room facilities Security room/ any room at safe distance can be identified as Control room with following facilities; ❖ Copy of the On-Site Emergency Plan ❖ Telephones- Land line and mobile phones. ❖ Plant layout ❖ Telephone numbers of factory key personnel ❖ Telephone numbers of neighbouring organizations, Emergency service providers. ❖ List of all Emergency Response Team members. ❖ SDS of Chemicals used ❖ Keys to unlock all entrance / exit doors and gates. ❖ Fire proximity suits. ❖ CO_2 & DCP fire extinguishers. ❖ PPE for Emergency Response Team members. ❖ Self-Contained Breathing apparatus. ❖ Spill kit ❖ Battery operated megaphones. ❖ Tool kit to carry out repairs.
27.	Key Personnel of the Industry- Internal	Details of officers who will respond and are empowered to take decisions with name, designation & contact number

28.	Alert action plan During working & Non-working hours Emergency organization chart Roles and Responsibilities of Various Emergency response Teams	1. Fire fighting/Combat Team 2. Rescue Team 3. Medical Team/ First aid team 4. Auxiliary Team (Explain formation of Teams)
29.	Actions by other key Personnel	Engineering, Utility & Maintenance Team, Electrical, Operators, Security personnel etc.
30.	Notification & Declaration of emergency	Should be simple and easy to understand
31.	System for evacuation of personnel /Emergency Evacuation Procedures	How the employees are communicated to evacuate and reach to safety.
32.	Method of disclosure of information to personnel liable to get affected	Action Plan for training/awareness on the hazard to your employees, and action during emergencies
33.	Evacuation Route & Safe assembly points	Attach evacuation route map showing the evacuation routes and safe assembly Point/s. Explain the reasons for selecting the identified safe assembly point(which is free from danger including the wind direction)
34.	Mock Drills	Plan for conducting mock drills and schedule
35.	Accounting of personnel /Roll Call of Personnel	Head count of your employees (methodology)
36.	Control & Combat emergency	Explain the procedure adopted/proposed to be adopted

37.	Information to the public & Media	Flow of information through District Administration/Local Authorities for proper accountability
38.	Information to the Government authorities	The list of Authorities including the District Administration to be notified in case of emergency with Contact Details
39.	Law and order	How Law and Order will be ensured with details of nearest Police Station and Fire Station
40.	All clear signal	Procedure to declare al clear shall be explained
41.	**Annexure 1** -Site map showing all the facilities and the nearby factories/structures, roads, gates, egress, hazard areas, safety systems, hydrants, water storage, ambulance room, safe assembly points etc.,	(A separate A2 size Layout drawing to be attached)
42.	**Annexure 2**- List of ERT Members All ERT team members list-Fire Fighting/Combat, First Aid, Rescue and Auxiliary teams	Furnish the details
43.	MSDS/SDS (Safety Data Sheet) of major Chemicals used Give a list of Major Hazardous chemicals which are stored in maximum quantity and attach MSDS/SDS of such Important chemicals	Furnish the details

Note: *Information pertaining to safety, risk perception, hazard identification and public liability warranting for emergency management in addition to the above furnished information may also be included in the plan.*

The On-site emergency plan so prepared shall be documented in a printed form. The emergency plan shall be rehearsed and practiced at regular intervals to test efficiency of personnel, equipment coordinated efforts and to increase confidence and experience to operate such plan.

a. *Fire fighting drills shall be held as often as necessary and at least once in every period of two months*
b. *Mock drill of the On-Site emergency shall be conducted at least once in every six months involving the neighbouring industries, mutual aid members and local authorities*
c. *Ensure involvement of Hospital/ Doctor's participation in periodic Mock drills and explain them the hazards and first aid requirement / antidote requirement /MSDS.*
d. *The plan so prepared should be updated annually and uploaded in the factory website for easy reference.*