OFF SITE EMERGENCY PLAN

LCG : BARDOLI & MAHUVA

INDUSTRIAL POCKET

PREPARED BY

BARDOLI & MAHUVA LOCAL CRISIS GROUP

SEPTEMBER-2024

FOREWORD

Off-site Emergency Plan for Bardoli & Mahuva Local Crisis Pocket is prepared in September 2024, to incorporate the latest changes happened in the Bardoli & Mahuva Industrial area.

I appeal to all members of concerned departments, organisations, agencies, etc. to go through the document and prepare own action plan to handle & control such chemical emergency. It is also mentioned that adequate resources shall be maintained in working conditions; so as to be utilised during chemical emergency or transportation; even at any odd time.

I appreciate that Mr. S. G. Patel, Dy Director, Industrial Safety & Health, Surat and Member Secretary, Local Crisis Group and her colleague, who have put efforts in preparing the Document.

I thank to all the members of committee, who have contributed valuable inputs in preparation of this plan**.**

Date:

(MR. SMIT LODHA, IAS)
CHAIR MAN
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&
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Preface

The Response Actions on chemical accidents/industrial emergency is different than Natural Disaster/ Emergency. Further, the activities on storage and transportation of bulk quantity of hazardous chemicals are tremendously increased, which may strike Transportation Chemical Emergency at any time.

"Off-Site Emergency Plan" for Bardoli & Mahuva Industrial Pocket is prepared first time in September 2024 after New MAH was identified in Bardoli & Mahuva Industrial Pocket area to incorporate the various amended statutory provisions as well as instructions and guidelines issued by different authorities.

Further, I am grateful to Shri R. A. Patel, Jt. DISH, Surat, who has taken initiative and necessary guidance in preparation of this document.

I am thankful for the help and co-operation provided by Management of M.A.H. Units located in Bardoli & Mahuva Industrial Pocket.

I express my sincere thanks to Mr. Mayoor J. Vaghela, Chartered Engineer & Competent Person, Vadodara, on behalf of "**HELPS**" Vadodara, who have help us in preparation of this document.

Date: .

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OFF-SITE EMERGENCY PLAN

BARDOLI & MAHUVA LOCAL CRISIS GROUP

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OFF SITE EMERGENCY PLAN

PART – I

DESCRIPTION
SECTION

BARDOLI & MAHUVA LOCAL CRISIS GROUP

: Prepared By :

LOCAL CRISIS GROUP
BARDOLI & MAHUVA INDUSTRIAL POCKET

SEPTEMBER-2024

CHAPTER - 1 INTRODUCTION

1.1 INTRODUCTION

Due to increased transportation and Natural climatic changes, the risk of accident/incident is increasing day by day. The global effect on earth is unexpected and undesired. Like other Management system, Disaster/Emergency also needs to be managed in the systematic way by adopting and practicing an effective management tools. These can be mitigated with thoughtful planning.

The huge quantities of different chemicals are storing, handling or processing/ producing at various chemical factories/units; which are threat of chemical emergency/disaster. Minor accidents on chemical do not much impact or damage, but major accidents involving large quantities of chemicals in industries or during transportation of hazardous chemicals; would cause extensive damage to persons, properties and environment. Emergency situation arises all of a sudden and contains high potential to cause havoc. This is called as chemical accidents/ Disaster / Emergency, which requires special response actions and control measures.

It is noted that such types of incidents were strike at the most unexpected time. Further, chemical emergency may in form of any particular major emission of gas, Chemical liquid release, fire, or explosion, involving one or more hazardous chemicals and resulting uncontrollable developments during the course of industrial activities or transportation or due to natural events leading to severe effects both immediate or delays; inside or outside the installation likely to cause substantial loss of life and property including adverse effects on the environment.

Therefore, advance emergency planning and proper training of every person in the emergency functions are very essential to make emergency control measures more effective.

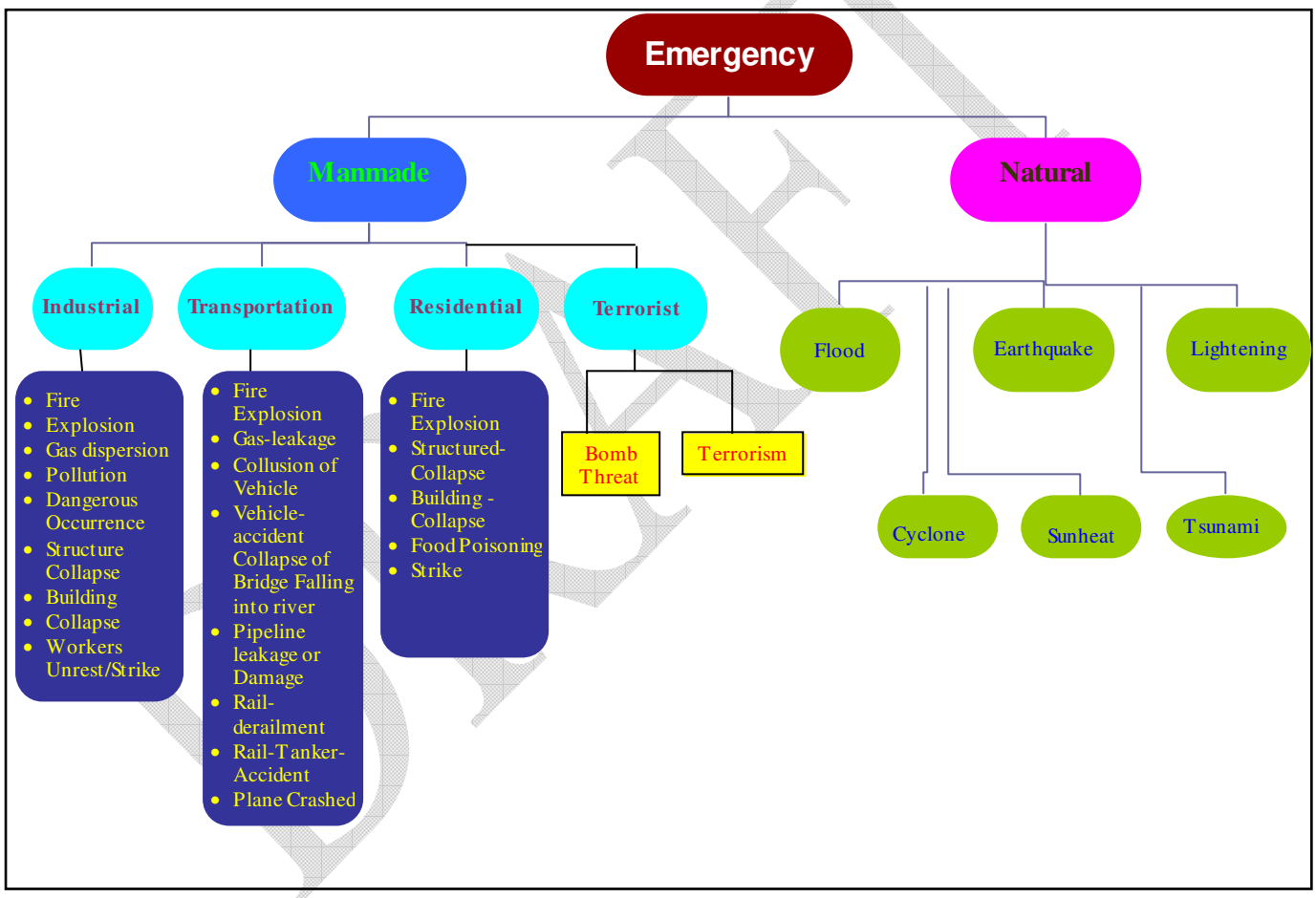
1.2 TYPE OF EMERGENCY

The emergency can be classified broadly in the following manner;

(1) Manmade Emergency

(2) Natural Calamity

Further, Emergency can be divided in the following way;



1.3 CLASSIFICATION / LEVEL OF EMERGENCIES AS WELL AS MANAGEMENT

The level of chemical emergency can be classified according to the gravity of the situation at site. The command and control will follow as per the level of emergency.

1.3.1 LEVEL – I : ON SITE EMERGENCY :UNIT MANAGEMENT

The type of emergency arises in the unit, which can be handled and controlled by the management with own resources as per On-site emergency plan, is called as On-site or Level–I emergency.

1.3.2 LEVEL – II : OFF-SITE EMERGENCY :LOCAL CRISIS:

While the Level – I emergency is uncontrollable by internal sources of the management, more help is required, the Local Crisis Group and neighbouring units or mutual aid members consisting local units will provide their resources to tackle the situation. The emergency of the unit; which is handled and controlled with the help of outside resources, is called as Local Crisis or Level – II emergency. Further, this type of emergency will be governed by the Local Crisis Group.

1.3.3 LEVEL – III : OFF-SITE EMERGENCY : DISTRICT CRISIS:

Even after putting efforts as explained in Level – II, the situation becomes uncontrollable and worst, the District Crisis Group will take over the charge to handle the emergency situation. This will be termed as Level – III emergency.

1.3.4 LEVEL – IV : OFF-SITE EMERGENCY :STATE CRISIS / NATIONAL CRISIS

Considering the gravity and situation of the emergency, it cannot be controlled by the Local or District Crisis Group; the State/National Crisis Group has to command and control such crisis by utilizing all resources from the State or Nation, as per prevailing circumstances.

1.4 CRISIS GROUPS

The government has initiated the efforts to mitigate such industrial disaster / emergency by introducing the Rules, like; 'Manufacture, Storage and Import of Hazardous Chemicals Rules-1989(2000)' & 'Chemical Accidents (Emergency Planning, Preparedness and Response) Rules-1996 (2000)' under the Environment (Protection) Act 1986.

Further, National Disaster Management Authority, Govt. of India has issued Guide Lines on Chemical Disasters in April 2007.

In order to respond a chemical emergency, various co-ordinated efforts are to be made by crisis group at various levels; i.e. local level, state level or central level.

The following Crisis Alert Systems are constituted as per 'Chemical Accidents (Emergency Planning, Preparedness and Response) Rules-1996 (2000)' under the Environment (Protection) Act 1986.

(1) Central Crisis Group – The apex body at the Central Level.
(2) State Crisis Group – The apex body at the State Level.
(3) District Crisis Group –The apex body at the District Level.
(4) Local Crisis Group – The apex body at the Local Level.

1.5 DISASTER / EMERGENCY MANAGEMENT PLAN (DMP)

The chemical emergency control plan has two separate identities as per gravity of the incidence.

1. On-Site Emergency Plan
2. Off-Site Emergency Plan

The first is to be prepared by an industrial unit as per provisions under statute and under the guidance of government & local authorities, while second one is to be prepared by the Local Crisis Group with the help of government machinery and other resources; as per Schedule 12 of Rule-14 under MSIHC Rules-1989(2004)

1.6 OFF SITE EMERGENCY PLAN

The Off Site Emergency Plan is to be prepared and keep up-to-date by the authorities of the Crisis Group itself, as the containing particulars specified in Schedule-12 under R-14(1) of MSIHC Rules-1989 and Rule 2(i) of The Chemical Accidents (Emergency Planning, Preparedness &

Response) Rules-1996. The respective Apex Body has to prepare Off-site Emergency Plan of their area and up-date the said Plan periodically.

(1) *Off Site Emergency Plan for State:* State Crisis Group

(2) *Off Site Emergency Plan for District:* District Crisis Group

(3) *Off Site Emergency Plan for Local:* Local Crisis Group.

1.7 EMERGENCY MANAGEMENT CYCLE

Like other management system, Disaster also needs to be managed in a systematic way by adapting and practicing an effective management tool. The system must be driven consistently till the situation is normalised without any threats. Since the impact of any Disaster destructs not only the physical conditions of the affected location, but also have demoralised psychological impact on the affected community and surrounding atmosphere.

The system is based on the four major components of management tools, which are in the sequential form and strongly interlinked in one and all.

1. **PREPAREDNESS:**

   Activities prior to a Disaster.

   Document Preparation & collection of details.

   Examples:, Composition of Crisis Group, Identifying M.A.H. Units, their chemicals and type of emergency, Toxicological Details, Fire Response, Police Response, Transportation, Meteorological Details, Shelters, Medical/Health Facilities, Communication Arrangement, Emergency Exercise/Training, warning System, etc.

2. **RESPONSE:**

   Activities during a Disaster:

   Examples: Immediate Communication, Assessment, Task-Force, Control Measures, Public warning system, Emergency separation, Emergency Relief, Logistics & Supply, Search and Rescue, etc.

3. RECOVERY:

Activities following the Disaster:

Examples: Emergency Shelters, Evacuation, Cleanliness & Disposal of wastes, Long Term Medical Care and counselling, Claims processing and grants, etc.

4. MITIGATION:

Activities that reduce the effects of Disaster:

Examples: Re-consideration on safety measures of M.A.H. Units and response Actions, Building Codes & Zoning, Rehabilitation, Proper Reporting, Vulnerability Analysis, Public announcement and education, Reconstruction, Interaction with all authorities, etc

1.8 LOCAL CRISIS GROUP (LCG)

Local Crisis Group is a body as constituted under Schedule VIII of Rule-8 of CA (EPPR) Rules 1996. The management is multi-stakeholder approach. The Chair Person of the body is Sub-Divisional Magistrate, from District Administration, who performing duties in the industrial pocket. Member Secretary is an Officer from Office of Director of Industrial Safety and Health (Factory Inspectorate), of respective industrial pocket.

The Local Crisis Group is an apex body in the industrial pockets to deal with chemical accidents and co-ordinate efforts in planning, preparedness and mitigation of chemical accidents. Thus, administrative structure is provided to mitigate the chemical accidents/disaster /emergency at local level, if the incident is not controllable by the industrial unit and escalate to out side of the premises of the unit. Such incident is called Emergency Level-II, LCG will try to handle and control the incident by available resources as per Off-site Emergency Plan. After putting their efforts, if the incident could not control by them, then it will be reported to the DCG, then it will be treated as Emergency Level –III.

1.9 FUNCTIONS OF LCG

The Local Crisis Group has to carry out the following functions, as per Rule 10 of CHEMICAL ACCIDENTS (Emergency Planning, Preparedness and Response) Rules-1996.

(a) To prepare Off-site emergency plan to mitigate chemical accidents within the industrial pocket.

(b) To ensure dovetailing of the Local level off-site emergency plan with the District off-site emergency plan.

(c) To train personnel involved in chemical accident management.

(d) To educate the population likely to be affected in a chemical accident about the remedies and preparedness in the area.

(e) To conduct at least one full-scale mock-drill of chemical accident at a site every six months and forward a report to the District Crisis Group.

(f) To respond to all public inquires on the subject.

(g) The Local Crisis Group shall meet every month and forward a copy of the proceedings to the DCG.

(h) The Local Crisis Group shall provide information regarding possible chemical accident at a site in the industrial pockets and related information to the public on request.

(i) The Local Crisis Group shall assist the M.A.H. Units in the industrial pocket in taking appropriate steps to inform persons likely to be affected by a chemical accident.

1.10 AID & ASSISTANCE

Provisions under Rule 12(b) of CA (EPPR) Rule -1996

The Major Accident Hazard installations in the industrial pockets shall aid, assist and facilitate the functioning of Local Crisis Group.

1.11 STAGES OF THE EMERGENCY PLAN

There are three basic structures or stages to be considered in preparation of emergency planning, as per below.

1.11.1 ***STAGE : 1 Pre-emergency Period***

It is the normal working period, preparatory stage for conducting meetings, collecting details on chemical accidents and documentation on Off-site Emergency Plan. Preparatory period for identifying M.A.H. Units, collecting on-site emergency plans, their details, M.S.D.S. of hazardous chemicals, to identify the type of emergency & procedures for responding actions, development and maintenance of resources against probable risks and hazards, along with maintaining adequate emergency facilities etc works are carried out by on-behalf of LCG i.e. by Members of LCG, mainly Officers from Factory Inspectorate, emergency services, and other members of LCG. Preparation of Off-site Emergency Plan; review and modification of Off-site Emergency Plan time to time. Further, it includes preparedness, awareness, training parts and conduction of massive mock-drill/exercise during the normal working. This is the important stage, which can be evaluated during actual emergency.

1.11.2 ***STAGE :2 During Emergency***

It is the actual responding period, performance of the specific duties and responsibility of the emergency services and designated members of LCG, with use of planned resources in systematic ways. Various responding actions carried out by emergency services and other members of LCG to handle and control the industrial emergency in minimum period with coordinated way under command of chair person of LCG.

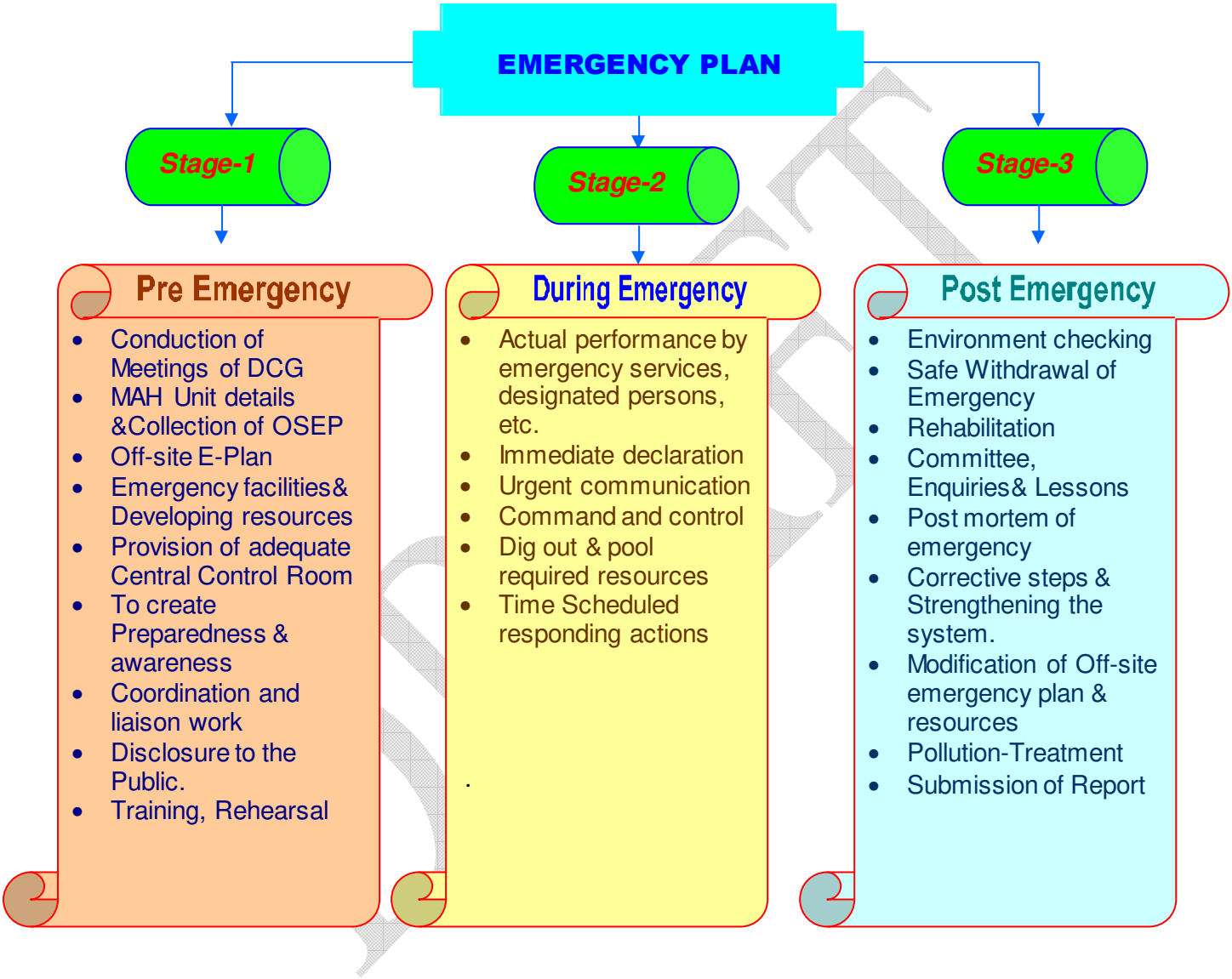
1.11.3 ***STAGE :3 Post Emergency***

On controlling the emergency, work on safe withdrawal of emergency, safe rehabilitation, the inquiry, investigation on cause of chemical accident, improvement of resources, modification of Off-site Emergency Plan, corrective steps, Treatment of Pollution etc are processed, the stage is called as

post emergency period. A meeting of LCG will be called and discussed the issues. The report will be prepared on the chemical accident/Disasters & submitted to District Crisis Group.

The above stages are indicated in chart as given below:

CHART



1.12 ACCIDENT REPORTING TO LCG

Where any chemical accident occurs at installation and management try to control by own resources, but gravity of incidence is such that it could not control by them, then it has to report to the LCG. Further, any person or SMC or neighbouring industry shall inform to the Fire Brigade, Police, CCR or Chair Person of LCG. The said report will be noted and verify on telephone, the emergency services deploy the

team to the incidence place and communicate the further report to the HIGHER authority.

1.13 REPORTING TO DISTRICT CRISIS GROUP (DCG)

While LCG is trying to handle and control the situation of chemical accident and could not control by utilizing resources within their command and situation is turned to LEVEL-III, then immediately Chair Person will report to the DCG. On getting report/information on chemical accident, DCG will act according to laid down procedure.

1.14 INFRASTRUCTURES FOR LCG

The activities related to chemical emergency are carried out through Centre Control Room working under LCG.

The following infrastructures/facilities at Centre Control Room are to be maintained by Local Crisis Group.

1. Office Accommodation : Office, Meeting Room, communication Centre, Stores, Training Hall, Pantry, Parking Area, etc.
2. Adequate Communication System with internet Facilities.
3. Documents & Details: Copy of Off-site Emergency, On-site Emergency Plan of the Units, Depot, storages of Hazardous Chemicals located in the areas. Transportation details of Hazardous Chemicals and District Maps, Industrial Estate Areas Maps, Road Maps, Map of water resources, Police Stations, Medical Hospitals, PHC, Safe Shelters, List of Emergency contact persons; and expert persons, Weather Details, Population Details, List of suppliers of Antidotes and emergency medicines. List of suppliers of P.P.E. and Emergency Safety Equipment, Fire fighting equipments and material etc.
4. Emergency Vehicles, availability of Ambulance, Bus, Trucks, JCB, Tractors, Mobile Cranes, etc.
5. Officers and Staff: Adequate Technical Officers, Staff, Messengers, Peons, Drivers, Helpers, Operators, etc.

6. Office Furniture, Equipment, Computers, Printers, D.G. Set, etc.
7. Provision of adequate finance resources to meet emergency purpose and office-running expenditures.
8. Liaison with DCG and Reporting System to DCG.
9. Maintaining registers for enquiry from Public, Education on emergency, Report on Chemical Accident/Emergency, Conducted Mock Drill/ Rehearsal/ Exercise, etc.
10. Other requirement for emergency Purpose.

CHAPTER - 2

BARDOLI & MAHUVA LOCAL CRISIS GROUP

2.1 MAP : BARDOLI & MAHUVA INSUSTRIAL POCKET

The map of Bardoli & Mahuva Industrial Pocket is given at Annexure-1.

2.2 RESPONSIBILITY OF BARDOLI & MAHUVA LCG

When chemical accident occurs in industrial pocket, and the management could not control such incidence, then it will be reported to LCG, now, it is the responsibility of LCG to handle and control the chemical accident, which is called as emergency Level-II. The responsibility of LCG is limited to area of industrial pocket only. Further, if intensity of incident becomes more severe, and turned into Level-III, then, the responsibility to handle and control the said chemical accident is transferred to District Crisis Group.

2.3 HANDLING OF CHEMICAL EMERGENCY

The ultimate responsibility to manage the emergency rests with the Chair-Person of Local Crisis Group in case of level-II. i.e. Local Crisis as arise in Local Industrial pockets, at his command.

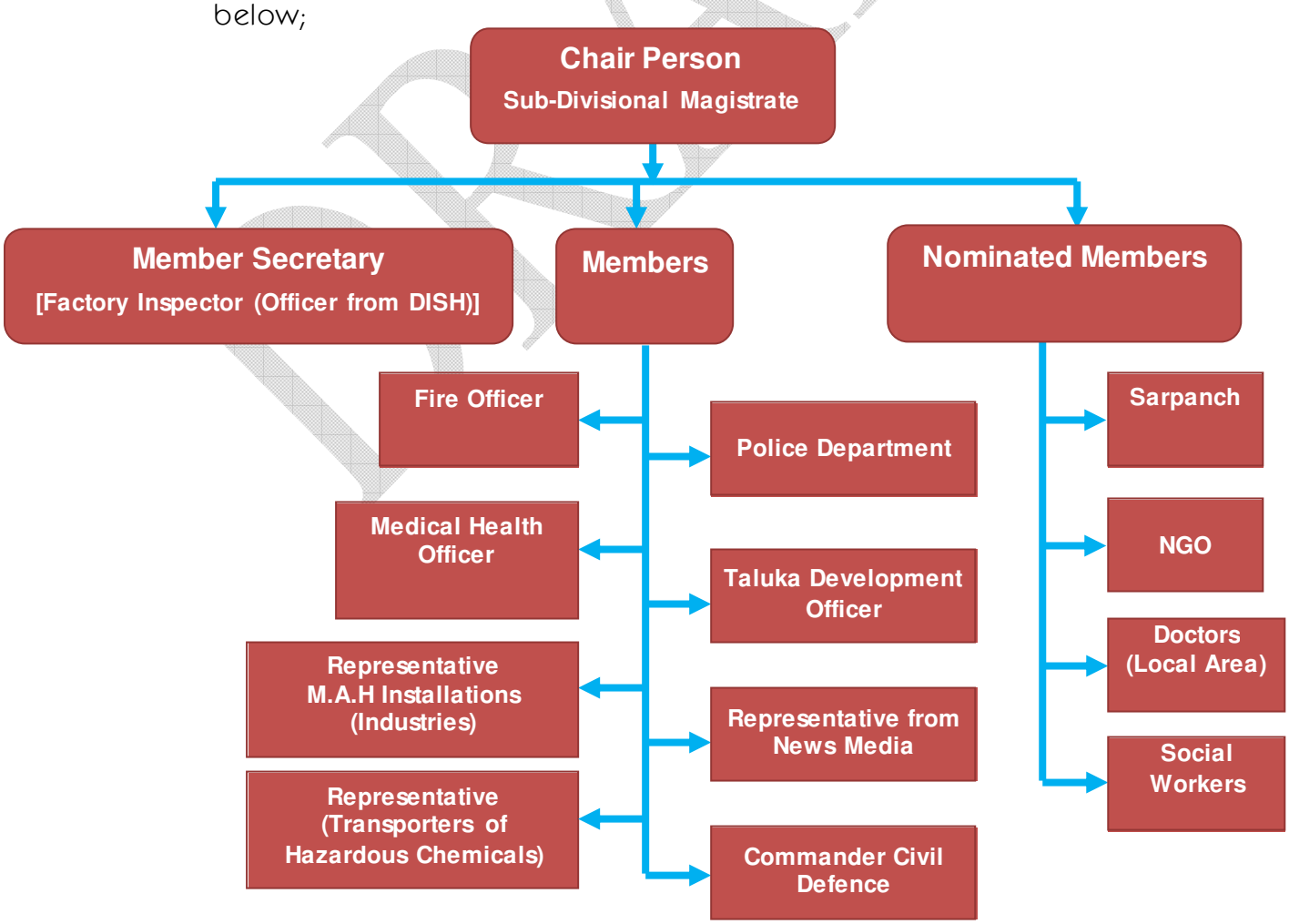
The Local Crisis Group should ensure to get equipped with essential and adequate resources and maintaining into working orders by their designated members including emergency services.

The successful handling of the emergency depends on correct decision and immediate actions on site by emergency management which includes emergency services and members of LCG. Combating the emergency and minimizing the loss to people, property and environment; depends on the following factors;

1. Lapsed time between striking of emergency and communication to emergency services.
2. Effective, perfect and immediate communication of emergency messages to the respective designated persons.
3. Response, time-activation & mobilization of resources at appropriate places.
4. Quality of decision making at site and at Central Control Room.
5. Deployment of resources in effective manner.
6. In case of uncontrollable condition, it will be handed over to DCG for further actions.

2.4 DESIGNATED PERSONS

The members of LCG are holding the additional responsibilities during emergency period, though same type of work is required to be carried out but on urgent duty. These members are identified as Designated Persons of LCG. The structure of LCG can be indicated as below;



2.5 COMPOSITION OF BARDOLI & MAHUVA LOCAL CRISIS GROUP

The composition of Bardoli & Mahuva Local Crisis Group is given at Annexure-3.

2.6 ROLES & RESPONSIBILITIES OF DESIGNATED PERSONS

In order to achieve higher order of controlling emergency on the site effectively, members' roles and responsibilities shall be specifically defined. The plan shall include work performance during pre-emergency, during emergency and after emergency period. The Taskforces have to be constituted, for activating response measures in specific sections. It is expected that each task force shall develop the standard operating response procedures for specific industrial disaster / emergency.

Further, Chair-Person has to ensure to perform their assigned roles with adequate resources. The functions of key designated persons of LCG are described as given below;

2.6.1 CHAIR PERSON : (SUB DIVISIONAL MAGISTRATE)

Being Chair Person of Local Crisis Group, he will be in over all command & control of emergency actions to handle the industrial chemical accidents effectively for the Local industrial pocket in case of industrial emergency Level-II.

The main functions, which include in form of preparatory, responding and re-establishing actions; as follows;

A) To chair the meeting of LCG.
B) Preparation or updating of off-site emergency actions plan for Local industrial pockets & dovetailing with District Off-Site emergency Plan.
C) To ensure performance of role by each person involved in emergency services effectively.

D) To activate and maintain essential resources & facilities at the Central Control Room round the clock.

E) Arrangement to train the persons involved in chemical accident-management and assist them in public information.

F) To assess emergency situation and have to declare the industrial emergency, call and direct the emergency services to respond the industrial emergency and provide reinforcement and support by pooling the resources from the Local industrial pocket.

G) The arrangement for announcement to the public for rescue, evacuation, shelter, food, water, clothing, and transportation etc. to the persons in affected area.

H) To keep informed to the higher authority time to time.

I) To declare the withdrawal or termination of emergency.

J) Rehabilitation, restoration, clean up etc. on post-emergency actions.

K) Arrangement to educate the population likely to be affected in a chemical accident.

L) Arrangement to provide information regarding possible chemical accident in the industrial pocket and related information to the public on request.

M) To conduct the mock drill / exercise on industrial emergency time to time.

N) To submit the reports to DCG on industrial emergency.

2.6.2 MEMBER SECRETARY: (Asstt. Director, Industrial Safety & Health)

He has to perform the role, as Member Secretary of Local Crisis Group, mainly during pre-emergency period. As consented by Chair Person of LCG, He will do the work as below;

A). To identify Major Accident Hazard Units in the industrial pocket.

B). To prepare or update the off-site emergency action plan for local industrial pocket & dovetailing with District Off-Site emergency Plan.

C). The Off-site emergency action plan should dovetail with the on-site emergency plan as prepared by the Major Accident Hazardous Units in the local industrial pocket.

D). To arrange the meetings of Local Crisis Group in consultation with Chairman.

E). To feed technical & chemical data & information in respect of industrial units situated in Local industrial areas. To provide technical inputs to ensure safety, health & environment of workers, properties and population in vicinity.

F). To advice & guide for proper & effective handling & controlling actions as required by emergency services during industrial emergency / plan.

G). To arrange to conduct the mock drills, post emergency inquiry etc.

H). To advice and provide information on maintenance of CCR.

I). The major functions are to be carried out during pre-emergency period.

2.6.3 MEMBERS : Emergency Services

The major response actions during chemical emergency are to be conducted by specific functionaries, who are called emergency services for LCG, include as below;

(1) Fire Services

(2) Police Department

(3) Health & Medical Department

The stage-wise action plan for their task- force, i.e. (1) Preparatory, (2) Responding and (3) Re-establishing periods,

shall be prepared to mitigate the chemical accident by each service.

2.6.3.1 MEMBER : FIRE SERVICES

Most probably, the first information regarding any incidence / event / fire / gas leakage is received by the fire services. Thus, fire services; being first respondent, has to play the major role during the chemical emergency because message should reach to the appropriate person with in a shortest period; so that responding actions can be started immediately to control the chemical emergency. Being responsible services, they perform their duties very systematically; however, major duties for LCG can be described as below;

A). To attend the meeting.

B). Fire Services shall be adequately trained & equipped to handle the chemical emergency.

C). Fire Services are to acquire a thorough knowledge of likely hazards at the incident site and the emergency control measures required to contain it.

D). Inspection, Survey & assess the situation where incident occurred & give the report.

E). To decide the proper & effective actions and immediate response actions to control the industrial emergency, under intimation to Off-site Control Room or Chair Person.

F). Proper training to fight against industrial hazards and knowledge on identification of such hazards.

G). Rescue, Evacuation, Removal of debris, and other emergency work as directed or instructed.

H). To maintain the proper and adequate fire fighting equipments and resources, neutralizing media, self-breathing apparatus, emergency equipments,

personnel protective equipments and to maintain in working order.

I). The knowledge & information on different type of alternative resources, various types of extinguishing media, neutralizing media, chemical properties and their hazards of the substances with safe handling procedure.

J). To participate the Mock Drill / Rehearsal & training.

K). Liaison with Off-site Control Room and other emergency services.

L). To prepare own details action plan to mitigate chemical accidents & to ensure the provisions to handle and control the industrial emergency.

M). Other duties as required during actual emergency.

2.6.3.2 MEMBER : POLICE DEPARTMENT

Another authority who gets the first information on incident / accident is police department. The Police Department is performing very wide role and working with various capacity. However, role of the police department for LCG are describes as below;

A). To attend the meeting.

B). To access the situation and report immediately to the authorities.

C). Generally, Police will take overall charge of the Off-site situation till arrival of the Chair Person/Representative.

D). To maintain the law and order during the industrial emergency. To control the traffic and control the situation at affected area.

E). Arrangement to announcement to the public.

F). To protect the life of people, inside, outside as well as road movers.

G). To protect the property & environment.

H). Help & assist in evacuation, rehabilitation, shelter &

transportation work during the industrial emergency as per prevailing situation.

I). Help & assist to make area clean, removing of any structure and other similar work as required during actual emergency.

J). To participate in Mock Drill / Rehearsal & Training.

K). Liaison with Central Control Room and other emergency services / organizations / agencies.

L). To prepare their own detailed action plan on chemical emergency & to ensure the adequate provisions to handle the industrial emergency.

M). To plan clear chain of command and control for controlling traffic at accident site.

N). To arrange necessary equipment for warning the population.

O). To prepare procedure to regulate traffic and diversion of traffic on approach road to accident prone industrial areas.

P). Prepare road map of industrial pocket; indicating possible alternate approach routes & exit route to & from affected areas.

Q). Special training shall be imparted to the police personnel for transport chemical emergency involving HAZCHEM & HAZMAT, etc

R). Other duties as required during actual emergency.

2.6.3.3 MEMBER : HEALTH & MEDICAL DEPARTMENT

The health and medical services have to play vital role following the emergency. One fold is proper & timely treatments to the victims injured or affected persons. Other fold is to safe guard the public health.

The health & medical services are always ready to perform their responsibilities during preparatory; responding and re-

establishing periods. However, their roles for LCG are described, as below;

A). To attend the meeting.

B). To ensure the arrangement & preparedness for special medical treatment, antidotes and trained doctor Para-medical staff as specified in toxicology at the time of chemical emergency in local industrial pockets.

C). On declaration of emergency or on receiving the message or information, prompt medical facilities shall be set up e.g. first aid post, casualty receiving centre / camp etc. as per gravity of situation at site. Similarly, arrangements for emergency operation or special treatment on chemical burn, injury, gas inhalation etc. with adequate numbers of beds arrangement, which will serve the purpose of Base Hospital.

D). Identification of dead bodies and post mortem arrangement.

E). To maintain upto-date list with telephone nos. of services of doctors, hospitals, ambulance, primary health centre, Para-medical staff, vehicle to meet the emergency situation.

F). Arrangement to inform the upto-date status of situation, time to time to Central Control Room, Chair Person, relatives of injured or admitted patients, emergency services etc.

G). Arrangement to safe guard the public health in case of development of any epidemic situation & announcement on safety measure to be taken by public at the time of emergency.

H). To advice & guide the Local Crisis Group in respect of medical & health part time to time.

I). Provision for proper and adequate medicines, life saving drugs, equipments, antidotes, Health-care facilities, etc. related to chemical emergency.

J). To participate in mock drills / exercise and training.

K). To prepare own detailed action plan to ensure the effective handling of chemical emergency.

L). Liaison with Central Control Room, Chair Person, Emergency Services, organization, agency and other related person.

M). Other duties as required during actual emergency.

2.6.4 MEMBER : TALUKA DEVELOPMENT OFFICER (TDO)

TDO will provide the help & assist to all the emergency services to control the emergency. However, the role for LCG can be prescribed as below;

A). To attend meeting and participate in activity actively.

B). To convince the public of the affected area to evacuate the houses and direct them to get shelter at specified places.

C). To get the help & assist from local leaders; if required. To mobilize the staff, sarpanch, Talati/ Clerk or Gram Panchayat etc, as summoned by Local Crisis Group, such as;

i. Man power from voluntary organizations

ii. Water resources at the accident site, etc.

D). To make the common amenities such as schools, party plots, places for shelter etc, in the concerned village for the affected victims.

E). To assist the village-hospitals to accommodate victims and ambulances for mobilization of victims.

F). To organize public awareness programmers in co-operation with major industries and LCG.

G). To decide shelters in the surrounding villages and city area for evacuees or affected persons.

H). Arrangement to rehabilitate the evacuees back to their homes on declaration of withdrawal of emergency.

I). To participate in mock drill.

2.6.5 MEMBER : INFORMATION OFFICER

The proper and correct news should be reached to the public to avoid rumour and panicky situation. The role of Information Officer is to create awareness and preparedness amongst the public for chemical emergency because of wide & fast spreading news.

A). To attend meeting, mock drill / exercises and training.

B). To assist & advice the public in case of rescue operation and evacuation work during emergency.

C). Arrangement to provide & spread immediate, correct, adequate, reliable and authentic news.

D). Liaison & co-ordination with Chair Person, Off-site Control Room and emergency services.

E). Ensure to safe guard the public at large during actual emergency by providing correct reliable authentic guideline and news.

F). Other duties or work as directed by Local Crisis Group or Chair person.

2.6.6 VOLUNTEER ORGANIZATIONS (N.G.O.)

The volunteer organization / services can play vital role to convince the person / public to evacuate the residence / place and to shift to safe shelter timely during Chemical emergency. Otherwise it may result more serious effect. To save the life of public is more important factor, which will be successfully carried out by the volunteer organization.

Further, Volunteer Organization can arrange to provide drink, food, clothes, shelters, man power etc during the emergency period as required and/or as advice/instruction by Authority of Local Crisis Group. NGO, social workers, etc are more helpful as Volunteer Organization. The list of such organization with address, telephone no. Organization etc will be prepared and

up-dated time to time. Other duties or works have to perform as directed by Local Crisis Group or Chair person.

2.6.7 MEMBERS : REPRESENTATIVES FROM MAH UNITS / EXPERT PERSON

The management of major accident hazardous unit has to maintain updated on-site emergency plan with necessary details with accurate information and a correct assessment of the situation. Representatives from M.A.H. Units have to attend the meetings and participate in mock drill/ exercise, and training etc activities pertaining to chemical emergency. The site main controller is responsible to provide immediately on occurrence of crisis at his unit with specific details, development and needed help; to Local Crisis Group. He will arrange, support & provide all resources, equipment, manpower, communication network from his own unit and co-ordinate with Local Crisis Group to combat the industrial emergency. Further, being expert person, they will provide and assist the safe handling & controlling for particular chemicals. Other duties or works are to perform as directed by Local Crisis Group or Chair person.

2.6.8 OTHER MEMBERS OF LOCAL CRISIS GROUP

The other members like Community leader, Editor of news media, doctors, Dy. Municipal commissioners, other officers from Government or private organization or agencies, etc. have to play the specific functions. However, the suggested duties as required during the emergency are express as below:

A). To attend meeting, mock drill / exercise and training.

B). To assist the public in proper way in case of rescue and evacuation during actual emergency.

C). To advice and guidance to the Local Crisis Group & Chair-person.

D). To arrange and help the supporting actions and duties in respect of chemical emergency.

E). To provide more and adequate resources & various requirement to tackle the chemical emergency immediately.

F). Liaison & co-ordination with Central Control Room and emergency services.

G). Other duties or work as directed by Local Crisis Group or Chair person.

2.7 CENTRAL CONTROL ROOM-LCG

The main functions of CCR are to receive and communicate the information/message/report/details to respective persons. Further, it should be kept readiness to meet the chemical accident / emergency role. In-charge of CCR will also maintain periodical touch with emergency services/ members of LCG and external agencies with a view to obtain their resource- position. It is said as activities centre and providing communication network for LCG all the time, but it has to put more efforts during actual emergency period. However, CCR is to be operated round the clock basis.

2.8 REPORTING SYSTEM

The communication system shall be foolproof. Any accident occurs in the industrial pocket, it should be reported immediately to the Chair Person of LCG. The said report should immediately reach to the emergency services for urgent response actions. The network on reporting and action taken shall be smooth and convenient to all respective concern members of LCG. On getting report, it shall be clear to concerned members/emergency services that what immediate response actions by them and they have to perform according under intimation to Chair Person & other members time to time.

2.9 EMERGENCY TELEPHONE NOS.

Emergency telephone numbers as required during emergency are given at Annexure – 2. These telephone numbers shall be updated time to time.

2.10 LIST OF FIRE SERVICES

The facility available at deferent fire stations of Municipal Corporation and others are given at Annexure -5.

2.11 LIST OF MEDICAL + AMBULANCE + BLOOD BANK

The List of Hospital, Ambulance and Blood Bank is given at Annexure-6.

2.12 METEOROLOGICAL DETAILS

The Meteorological details in respect of Vadodara District are given at Annexure-9.

2.13 LIST OF EXPERT PERSONS

The List of chemical expert persons from the Industrial pockets is given.

2.14 HAZARDOUS CHEMICALS

The Hazardous Chemical is defined under "Manufacture, Storage and Import of Hazardous Chemicals- Rules-1989(2000)". Further, Hazardous Chemical is defined under "Gujarat Factories Rules-1963 (2004)", and "Chemical Accidents (Emergency Planning, Preparedness & Response)- Rules- 1996". Thus, certain hazardous chemicals; as identified as per above Rules, along with United Nations' Numbers, C.A.S. Nos.; and Hazardous Classification are given in the Table below;

TABLE

Sr. No.	Major Hazardous Chemical	UN No.	CAS No.	Schedule-I of Rule 68-J of GFR1963 (2004)	Schedule-I of MSIHC Rules 1989 (2000)	Schedule-I of CA (EPPR) Rules -1996	Hazard Classification
1	2	3	4	5	6	7	8
1.	Acrylonitrile	1093	107-13-1	6	12	6	Flammable & Poison
2.	Ammonia	1005	7664-41-7	16	31	16	Toxic
3.	Chlorine	1017	7782-50-5	88	119	84	Toxic
4.	Ethyl alcohol (Ethanol)	1170	64-17-5		248		Flammable
5.	Ethylene Dichloride (EDC)	1184	107-06-2	198	271	194	Flammable & Poison
6.	Ethylene Oxide	1040	75-21-8	200	267	196	Flammable & Poison
7.	Formaldehyde	1198	50-00-0	209	285	205	Flammable & Corrosive
8.	High Speed Diesel (HSD)	1202	68476-30-2	Part I (b) (iii)	Part I (b) (iv)	Part I (b) (iii)	Fire
9.	Hydrogen Floride	1790	7664-39-3	228	317	227	Poison & Corrosive
10.	Liquified Petroleum Gas (LPG)	1075	68476-85-7	243	347	242	Flammable
11.	Petrol (Motor Spirit)	1203	8006-61-9	Part I (b) (ii)	Part I (b) (ii)	Part I (b) (ii)	Highly Flammable
12.	Sulphuric acid	1830	7664-93-9	371	591	370	Toxic & Corrosive

2.15 M.S.D.S.

M.S.D.S. of certain chemicals used by M.A.H. Units of the Bardoli & Mahuva Industrial Pocket are given at end of the Report.

2.16 MAJOR CHEMICAL ACCIDENT

An occurrence including any particular major emission, fire or explosion involving one or more hazardous chemicals and resulting from uncontrolled developments in the course of industrial activity or transportation or due to natural events leading to serious effects, both immediate or delayed, inside or outside the installation likely to cause substantial loss of life and property including adverse effects on the environment.--Rule 2(f) of C,A,(EPPR)Rules -1996.

2.17 MAJOR ACCIDENT

"MAJOR ACCIDENT" means an incident involving loss of life or outside the site or ten or more injuries inside and /or one or more injuries outside or release of toxic chemical or explosion or fire or spillage of hazardous chemical resulting in "on-site" or "off-site" emergencies or damage to equipment leading to stoppage of process or adverse effects to the environment.

- Rule 68-J (1) (d) of Gujarat Factories Rules-1963 (2004).
- Rule 2(j) of M.S. & I. of H.C. Rules-1989(2000).

2.18 IMPACT OF CHEMICAL ACCIDENTS/DISASTERS

Accidents on chemical which are near missing or minor types, do not much impact or damage, but in case of major accidents, involved large volume of inventories of hazardous chemicals or high toll of injuries, or release of toxic gas or spillage of hazardous chemicals or explosion, called as Major Chemical Accident/Emergency/Disaster; cause extensive loss of life, damage to property and adverse effect on environment. Further, emergency situation arises all of sudden and at most unexpected time with high potential to cause havoc. In addition to above, the major consequences of chemical disaster include impact on livestock, flora and fauna, the environment (air, soil, water) and tremendous losses to the industries.

2.19 PROBABLE CHEMICAL ACCIDENT SCENARIOS

2.19.1 General

Emergency preparedness is structured on maximum credible chemical accidents on chemical properties and maximum storage or process of the chemicals. However, it is pertinent to discuss the type and escalation of chemical emergency situation, which may arise from Liquid Flammable Material 7release or Toxic Material release.

2.19.2 FLAMMABLE SUBSTANCE RELEASE

The following examples show how events involving flammable materials may need different planned responses:

- **A major fire but with no danger of an explosion, e.g. fire in oil storage tank:**

  The hazards would be prolonged high levels of thermal radiation and smoke. It is unlikely that anyone outside the site would be affected immediately. Only houses close to and directly exposed to severe thermal radiation would need to be evacuated. In some cases, it might be desirable to evacuate those areas severely affected by smoke.

- **A fire threatening a major item of plant or a storage tank containing hazardous materials:**

  As a part of the on site assessment, the consequences of such an event should have been estimated and the area that it might be necessary to evacuate determined. Hence, the appropriate response might be to evacuate those potentially at risk.

- **A fire similar to (ii) above, but developing too quickly to allowing no time for evacuation:**

  The best possible response might be to advise people to remain indoors away from windows and shielded from line of sight of fire. Evacuation should NOT be attempted if there is a significant risk that fireball or BLEVE could occur while the people were in the open.

- **Catastrophic**

  For some major catastrophic events that occur without warning, it may not be possible to take prior emergency action. However, most such events are of very short duration. The role of emergency services would be to

rescue and do medical treatment of the victims, extinguishing secondary fires etc. on emergency basis.

2.19.3 Explosion

Explosions may be variously classed as.

1. Chemical Explosions/Thermal Explosion
2. Physical Explosions
3. Mechanical Explosion
4. Dust Explosions
5. Electrical Explosions
6. Nuclear Explosions

Explosions are frequently accompanied by fires and occur under similar circumstances. They may be sub-divided in to:-

1. Confined explosions in buildings, boilers, process plants, storages, Godowns etc.
2. Unconfined vapour cloud explosions.

Both confined and unconfined vapour cloud explosions usually originate in a leak of gas or vapour or vaporising liquid into the atmosphere.

Flammable gas-air mixtures have limits of detonability which have in many cases been determined and which lie within the flammability limits. On their sudden release to atmosphere trough vents, leaks etc, they form clouds which will depend upon the released quantity, physical properties, wind velocity, readily spread over the site. As most of the hydrocarbons gases are heavier than air, they fill up pits, pipes, trenches and other low lying areas. An explosion will occur if such a mixture of hydrocarbon and air within certain concentrations come in contact with a source of ignition. The leakage shall be quickly isolated and shall be allowed to disperse.

2.19.4 TOXIC SUBSTANCE RELEASE

The following examples show how events involving toxic materials may need different planned responses.

- **A slow intermittent release e.g. Through a leaking relief valve:**

  It would be unlikely that any one outside the site would be severely affected immediately, although many of the notifiable substances have irritant properties or an unusual smell. If there were reason to foresee that the release would not be controlled quickly or would grow with time, it might be desirable to evacuate those people nearest to the site or release and most closely downwind of it, provided that this evacuation would, increase their safety.

- **A fire or mechanical damage that threatened an installation containing toxic materials:**

  If the fire could not be controlled and there will likely to be a reasonable period before over pressurisation or plant failure can occur, evacuation might be appropriate. Once again priority should be given to those nearest the plant (in full directions) and those in an appropriate sector. (30°, downwind)

- **Rapid event with a limited duration e.g. The fracture of a component that could be isolated within a reasonable time:**

  Incident that grow and are immediately controlled should warrant evacuation. Any toxic cloud formed would be limited in size and would be likely to drift past a particular spot relatively quickly. The best place for people in the area would be indoors, upstairs with windows and doors closed.

2.20 LEVEL OF EFFECTS

2.20.1 Radiation & Burn

LPG or Hydrocarbon Vapour released accidentally will normally spread out in the direction of the wind. If it finds an ignition source before being dispersed below Lower Explosive Limit, a flash fire is likely to occur and the flame may travel back to the source of the leakage. Any other flammable substance within flash fire is likely to catch fire and a secondary fire may cause various degrees of burn.

The following tables indicate the damage effect due to radiation.

Table – 1 - Damage Due to Radiation Heat Intensity

Radiation Intensity [kw/sq.m.]	Type of Damage
0.7	Equipment to solar radiation
1.6	Will cause discomfort to long explosion
4.5	Sufficient to cause pain to personnel (First degree of burn is likely)
12.5	Minimum energy required for piloted ignite of wood, plastics etc.
25.00	Minimum energy required to ignite of wood.
37.5	Sufficient to Cause Damage to process equipment

Table – 2- Physiological effect of Radiation

Radiation Intensity [kw/sq.m.]	Type of Effect
65	Blistering of skin is caused
125	First Degree burns
250	Second Degree burns
375	Third Degree burns

NOTE: 1st Degree Burns: Involve only epidermis. (Sum burn is example). Blisters may occur.

2nd Degree Burns: Whole epidermis along with portion of dermis is affected.

3rd Degree Burns: Involves whole of epidermis & dermis. Sub-coetaneous tissues may also be affected.

2.20.2 Over Pressure &Blast Pressure :

Table -1–EFFECT OF OVER PRESSURE ON BUILDING/ STRUCTURE

Over Pressure		Effect
Bar	Psi.	
0.7	10.0	Total destruction of conventional structures.
0.5	7.2	Unreinforced brick panels 200-300 mm thick fail.
0.3	4.3	Cladding of light industrial buildings ruptured. Self-framing steel panel building demolished.
0.2	2.9	50% destruction of brickwork in house.
0.15	2.2	Particle collapse of walls and roof of houses.
0.1	1.4	Steel flame of clad building distorted.
0.07	1.0	Partial demolition of houses.
0.05	0.07	Minor damage to house structures.
0.03	0.04	Windows shattered. Occasional damage of frame.

Table -2- DAMAGE EFFECT OF BLAST OVER PRESSURE

Blast Over Pressure (psi)	DAMAGE LEVER
5	Major structural damage would be fatal to people inside or under the structure.
3	Storage tank failure
2.5	Ear drum failure
2	Reportable damage storage tanks, pumps etc.
1	Window pane breakages causing injuries

CHAPTER - 3

BARDOLI & MAHUVA INDUSTRIAL POCKET

3.1 M.A.H. UNITS

The M.A.H. Units identified in industrial Pocket of Bardoli & Mahuva Local Crisis Group are listed as below.

LCG – BARDOLI & MAHUVA

Sr. No	Factory Name	Address	Major Hazardous Chemical	Contact Person	Contact No.
1.	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	At & Post. Madhi, Tal. Bardoli, Dist. Surat-394 340	Absolute Alcohol Rectified Spirit Molassis Impure Spirit	Mr. Rohitbhai A. Desai, Managing Director	9825108931
				Mr. Sanjay I. Shah, Factory Manager	9879640178
2.	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	At & Post. Factory Site Bamania, Tal. Mahuva, Dist. Surat	Rectified Spirit Denature Alcohol Absoulate Alcohol Molasses Sulphuric Acid Sulphur	Mr. Bhaneshbhai Bhikhabhai Patel	9979875344
				Mr. Indrajeetbhai Balubhai Chaudhari, Factory Manager	9979875373

3.2 LIST OF MAJOR HAZARDOUS CHEMICALS

The major hazardous chemicals as stored/used by MAH Units as located at Bardoli & Mahuva LCG are listed as below:

1. Absolute Alcohol
2. Denature Alcohol
3. Impure Spirit
4. Molasses
5. Rectified Spirit
6. Sulphur
7. Sulphuric Acid

3.3 SURVEY OF PROBABLE TYPES OF CHEMICAL ACCIDENTS IN BARDOLI & MAHUVA INDUSTRIAL POCKET

The possible type of chemical emergency may arise at the M.A.H. Unit are described as below:

3.3.1 FIRE & EXPLOSION ACCIDENT SCENARIOS AT BARDOLI & MAHUVA INDUSTRIAL POCKET

Name of the Unit	Chemical	Largest Storage Qty. (MT)	PoolFire		Explosion Damage Distance (m)	
			FZR	IZR	FZR	IZR
Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	Absolute Alcohol	7752	847	1217	118	539
Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	Absolute Alcohol	500 KL	227	356	43	223

LEGEND

- IZR: Injury Zone Radius : Corresponds to 12.5 KW/sq.m for Pool Fire and corresponds to 1% injuries (0.01 bar) for UVCE
- FZR: Fatality Zone Radius : Corresponds to 37.5 KW/sq.m for Pool Fire and corresponds to 1% lethality (1 bar) for UVCE
- D-5 : Toxic vapour dispersion under Atmospheric Stability Class "D" (Neutral) and wind speed of 5 m/s
- F-1.5 :Toxic vapour dispersion under Atmospheric Stability Class "F" (Very Stable) with a wind speed of 1.5 m/s

3.4 FACT SHEETS OF MAH UNITS

The details in respect of name, address, manufacturing process, storage of major hazardous chemicals, work force, emergency contact persons' Name, Telephone Numbers, etc.

3.4.1 FACT SHEET of M/s. Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.

LCG -3 : Bardoli & Mahuva

MAH UNIT- 1

1.	**Name of the Factory**	:	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.
	Address	:	At & Post. Madhi, Tal. Bardoli, Dist. Surat-394 340
	Phone no. **E-mail**	: :	02622 – 241048, 99788 63303 mahisagar@rediffmail.com
	Longitude/Latitude of Company	:	
2.	**Name of Occupier**	:	Mr. Rohitbhai A. Desai, Managing Director
	Residence Address	:	Managing Director Bunglow Madhi Sugar Staff Colony
	Mobile No.	:	9825108931
3.	**Name of Factory Manager**	:	Mr. Sanjay I. Shah
	Residence Address	:	At & Post. Mandvi
	Mobile No	:	9879640178
4.	**Name of Safety Officer**	:	Mr. Niral N. Bhavsar
	Residence Address	:	At & Post. Kadod
	Mobile No	:	9427851755
5.	**Contact Person**	:	

Sr. No.	Name	Designation	Telephone Number	
			Factory / Office	Mobile
1.	Telephone Opeeator	Office	02622 – 241048, 99788 63303	9978863303

6.	**Nature of Manufacturing/ Product**	:	Sugar & Denatural Spirit / Ethyl Alcohol

7. Man Power & Timing

Shift	Time	Direct Employee		Contractor's Person		Security / Watchman		Total	
		M	F	M	F	M	F	M	F
General	08.00 to 05.00	11	-	-	-	2	-	13	-
1st	04.00 am to 12.00 am	10	-	-	-	2	-	12	-
2nd	12.00 to 08.00 pm	10	-	-	-	2	-	12	-
3rd	08.00 pm to 04.00 am	10	-	-	-	2	-	12	-
	Total	**41**	**-**	-	**-**	**8**	**-**	**49**	-

8. Hazardous Chemical Storage details

Sr. No.	Name	Type of Storage / Container	Capacity of each Container MT	No. of Container	Maximum Storage Capacity MT	Parameters	
						Pressure Kg/cm2	Temperature ^{0}C
1.	Absolute Alcohol	Warhouse	775277	01	775277	Atm.	Amb.
2.	Rectified Spirit	Warhouse	776673	02	776673	Atm.	Amb.
3.	Molassis	Warhouse	498144	01	498144	Atm.	Amb.
4.	Impure Spirit	Warhouse	82578	01	82578	Atm.	Amb.

3.4.2 FACT SHEET of M/s. Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.

LCG -3 : Bardoli & Mahuva | **MAH UNIT- 2**

1.	**Name of the Factory**	:	**Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.**
	Address	:	At & Post. Factory Site Bamania, Tal. Mahuva, Dist. Surat
	Phone no. **E-mail**	: :	(0265) 256835, 256846 mahuvasugarfac@gmail.com
	Longitude/Latitude of Company	:	
2.	**Name of Occupier**	:	Mr. Bhaneshbhai Bhikhabhai Patel
	Residence Address	:	At & Post. Factory Site Bamania, Tal. Mahuva, Dist. Surat
	Mobile No.	:	+91 9979875344
3.	**Name of Factory Manager**	:	Mr. Indrajeetbhai Balubhai Chaudhari
	Residence Address	:	At & Post. Kadheiya, Tal. Mahuva, Dist. Surat
	Mobile No	:	+919979875373
4.	**Name of Safety Officer**	:	Mr. Deepakkumar Shantilalbhai Patel
	Residence Address	:	At & Post. Karchrelia, Tal. Mahuva, Dist. Surat
	Mobile No	:	+919879491285
5.	**Contact Person**	:	

Sr. No.	Name	Designation	Telephone Number	
			Factory / Office	Mobile
1.	Mr. Chetanbhai Mehta	Admn. Officer	(0265) 256835, 256846, Ext. 207	9979875343
2.	Mr. Jayeshbhai Patel	Distillery Inch.	(0265) 256835, 256846, Ext. 257	9979679676
3.	Mr. Dharmeshbhai Patel	Dy. C.E.	(0265) 256835, 256846, Ext. 242	9904456798

6.	**Nature of Manufacturing/ Product**	:	White Crystaline Sugar / Ethanol / Absoulate Alcohol
7.	**Man Power & Timing**		

Shift	Time	Direct Employee		Contractor's Person		Security / Watchman		Total	
		M	F	M	F	M	F	M	F
General	8.00 am to 5.00 pm	354	-	-	-	1	-	355	
1st	04.00 am to 12.00 pm	220	-	30	-	2	-	252	-
2nd	12.00 pm to 08.00 pm	218	-	32	-	2	-	252	-
3rd	08.00 pm to 04.00 am	211	-	30	-	2	-	243	-
	Total	**1003**	-	**92**	**-**	**7**	**-**	**1102**	**-**

8. Hazardous Chemical Storage details

Sr. No.	Name	Type of Storage / Container	Capacity of each Container MT	No. of Container	Maximum Storage Capacity MT	Parameters	
						Pressure Kg/cm2	Temperature ^{0}C
1.	Rectified Spirit	Tank	500 KL	02	1000 KL	Atm.	Amb.
2.	Denature Alcohol	Tank	25 KL	03	75 KL	Atm.	Amb.
3.	Absoulate Alcohol	Tank	500 KL	04	20000 KL	Atm.	Amb.
4.	Molasses	Tank	500 MT	03	1500 MT	Atm.	Amb.
5.	Sulphuric Acid	Tank	15 KL	01	15 KL	Atm.	Amb.
6.	Sulphur	Godown	10 MT	01	10 MT	Atm.	Amb.

3.5 FIRE PROTECTION SYSTEM HELD BY MAH UNITS

Sr. No	Name of MAH Unit	Fire Water Tank		Emergency D. G. Set		Fire Pump Set		Fire Extinguishers								Fire Tendor / Fire Trailler Pump	No. of Trained Person in fire fighting
								CO_2		DCP / ABC		Foam		Fire Hose			
		No.	Capacity	No.	KV A	Type	LPM	Capacity	Nos.	Capacity	Nos.	Capacity	Nos.	Length	Nos.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	2	288907 m3	2	3 MW	Electrical Pump	2	9 Ltr	2	5 Kgs	8	50 Ltr	2	30 mtr	4	√	8
2.	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	1	5000 Ltr	01	625	Jockey main Pump	10.8 m3/hr 273 m3/hr	9 Kg 4.5 Kg 2 Kg	05 05 03	10 Kg 5 Kg ABC Type	20 25	10 Ltr	07	15 Mtr	30	-	20 Person

3.6 PERSONAL PROTECTIVE EQUIPMENTS HELD BY MAH UNITS

Sr. No.	Name of MAH Unit	SCBA	Canister Masks	Full Body PVC Suit	Fire Suit	Chemical Splash suit	Emergency Kit	Portable Detector
1	2	3	4	5	5	6	7	8
1.	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	1	4	1	1	1	-	1
2.	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	-	-	-	-	-	-	-

3.7 EMERGENCY VEHICLES FACILITIES HELD BY MAH UNITS

Sr. No.	Name of MAH Unit	Emergency Vehicles / Equipments						
		Bus	Truck	Dumper	JCB	Tractor	Crane	Car
1	2	3	4	5	6	7	8	9
1.	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	√	√	-	√	√	-	√
2.	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	-	-	-	2	4	-	4

3.8 MEDICAL FACILITIES AT MAH UNITS

Sr. No.	Name of MAH Unit	Telephone Numbers	FMO & Contact Number	Ambulance	OHC Beds
1	2	3	4	5	6
1.	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	98788 63303	99788 63303	1	1
2.	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	+91 8849001964	Sunilbhai Patel (Medical Officer)	1	10

3.9 ANTIDOTE AVAILABLE WITH MAH

Sr. No.	Name of MAH Unit	Name of Chemical	Name of Antidote	Qty of Antiodte	Supplier name and Mobile No.
1	2	3	4	5	6
1.	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	-	-	-	-
2.	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	-	-	-	-

3.10 EMERGENCY EQUIPMENT SUPPLIER LIST BY MAH UNITS

Sr. No.	Name of MAH Unit	Equipment	Supplier Name	Contact No	Address
1	2	3	4	5	6
1.	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	JCB	Madhi Sugar Factory	9978863303	Madhi Sugar Factory
2.	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	JCB Hydra Truck	-	-	-

3.11 POPULATION DETAILS SORROUNDING MAH UNITS

Sr. No.	Name of MAH Unit	Telephone Numbers	Name of nearby Village	Population
1	2	3	4	5
1.	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.	9878863303	Surali	150
2.	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.	-	Bamania Village	2000

3.12 LIST OF EXPERT PERSONS FROM MAH UNITS

Sr. No.	Name of Expert Person	Designation	Expertise on Chemical	Address	Mobile
1	2	3	4	5	6
1.	Mr. Rohitbhai A. Desai,	Managing Director	Absolute Alcohol Rectified Spirit Molassis Impure Spirit	Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd. At & Post. Madhi, Tal. Bardoli, Dist. Surat-394 340	9825108931
2.	Mr. Sanjay I. Shah,	Factory Manager			9879640178
3.	Mr. Bhaneshbhai Bhikhabhai Patel	Occupier	Rectified Spirit Denature Alcohol Absoulate Alcohol Molasses Sulphuric Acid Sulphur	Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd. At & Post. Factory Site Bamania, Tal. Mahuva, Dist. Surat	9979875344
4.	Mr. Indrajeetbhai Balubhai Chaudhari,	Factory Manager			9979875373

3.13 GLOSSARY OF TERMS AND DEFINITIONS

The words on chemical accidents and technical terms generally used are explained at the Annexure-19.

3.14 C. A.(EPPR) RULES-1996

The Abstract on Chemical Accidents (Emergency Planning, Preparedness and Respond) Rules-1996(2000) is given at Annexure-18.

3.15 MSDS

M.S.D.S. of certain Hazardous chemicals are given at end of the Report.

CHAPTER - 4 MAJOR ACCIDENT RESPONSE SYSTEM

4.1 INTRODUCTION

The successful handling of the emergency depends on correct decision and immediate actions on site by emergency services and designated persons/authorities of the LCG.

When incidence could not control by the management, then LCG will come in picture & have to take responsibility to handle the worst situation. However, in this circumstance, LCG will inspect, discuss with SMC, Emergency Services, Expert persons etc and assess the situation and start responding actions to handle and try to control the incident. Responding actions for designated persons, emergency services and others during emergency are explained in this chapter.

After putting their all efforts, if the situation cannot control, immediately, the LCG will inform to the DCG to take over the charge accordingly.

4.2 IMMEDIATE RESPONSE & DECLARATION OF EMERGENCY

On receiving information on chemical accident, the first respondent (Fire/Police) will immediately deploy first batch of response team to the location. On assessing situation, they will further reinforce their teams by deploying additional resources pooling from surrounding area so that effective first response can be redial at site. In the meantime, they will inform in detail to the Sub Divisional Magistrate, Central Control Room, Emergency Services and other authorities, and along with additional requirement of resources in terms of manpower and equipment etc.

On getting message, Chair person of LCG (SDM) will visit the incidence place and after getting more details from SMC, Emergency Services, Expert persons, Asstt., DISH etc; then assessing situation, he will declare EMERGENCY PERIOD for particular area, accordingly announcement will follow.

The emergency services along with designated persons will continue the responding actions to control the incident at site as pre-decided way or according to the prevailing situation under intimation to chair person and central control room. The M.A.H. Unit or affected unit will provide all support to LCG in mitigation, rescue & rehabilitation with their resources to emergency services.

4.3 CHAIR PERSON, LCG (SDM)

- On receipt of information on the chemical accident, the SDM will rush to the site, if grave serious incident, otherwise, get further details on the incident. The SDM will confirm the news with SMC/ Asstt. Director, DISH, then consulting with SMC, experts, Asstt. Director, DISH, emergency services and others, after assessing situation, he will declare "industrial emergency" & put Off-site Emergency plan in operation, and order to start responding actions to the emergency services/ designated persons etc. and report immediately. Establish the Local Command Post (LCP) & ask LCP/central control room to get details of development of situation time to time & report immediately. As development of situation and based on the inputs from the Emergency Services, and opinion by experts, SMC, members identify the requirement of additional and more resources, then SDM will arrange to pool and mobilize such resources.
- Further, if evacuation required, then order to emergency services & transport and evacuation coordinators to carry out accordingly.
- If situation is developing worst, even applying resources on his command, and it is not controlled by LCG, then; SDM will report to

DCG, as emergency is developing from Level-I to Level-II. Therefore, now DCG will take over the charge of the situation to mitigate the emergency.

- The diagram on command and respond by Chairman of LCG is given at Annexure 4-A.

4.4 MEMBER-SECRETARY : FACTORY INSPECTOR(DISH)

Being a Member Secretary (Asstt. Director, DISH) of LCG; he has to be involved in preparatory activities during pre-emergency period, like; arrangement of meeting of LCG, identify MAH Units and their details, preparation of Off-Site Emergency Plan & updation, Arrangement of mock-drill/rehearsal & training, chemical accidents and investigation etc. However, technical inputs can be provided during incident of chemical accident.

4.5 EMERGENCY SERVICES

Emergency services are important components of LCG. The general perception of their functioning is that they are involved in common non-chemical duties. At the times they have inhibitions to handle chemical accidents. However, emergency services include the following;

1. Fire Services
2. Police Department
3. Medical & Health Department.

The special jackets will be provided to all the members of crew of emergency services, as identification on emergency person on duties. The response from emergency services is described as below:

4.5.1 FIRE SERVICES

1. Immediately after receiving the message from informant/SMC, the Fire Commandant shall activate/mobilize the crew to order from all Fire Stations of SMC & rush at the site under intimation to LCG.

2. The Fire Commandant, before ordering, will ensure the type of fire-extinguishing media required and approximate quantity on getting information about the scene of fire or site or the unit.
3. At the site of incident, the Fire Commandant will thoroughly observe and inspect and survey the site for the use of fire media, and will start functioning accordingly, till the emergency is controlled in all respect, with constant touch with CCR, giving the details and adopted controlling procedures.
4. Fire Commandant will act as Incident Controller at site. All the agencies shall report to him at site.
5. Further, in case of more help required he will report to LCG accordingly with specific and clear instructions for such help.
6. For the suspect trapped personnel, in case of toxic gas leakages and major fire, rescue operation will be carried out as instructed by LCG on the advice of experts using necessary respiratory protection system.
7. If situation is unable to control by applying own resources, then they will report to the Chair Person. The responding actions will continue till DCG will take over the charge.
8. The Emergency Response Diagram for Fire Services is given at Annexure-4-B.

4.5.2 POLICE DEPARTMENT

Being a component of emergency services, on getting information about the emergency, from any source, deploy the team. On reaching team at the incident place team will collect the details on chemical accident and access the situation, simultaneously, report to the all authorities of LCG, along with measures taken and further actions required to be taken with requirement of additional resources and equipment. Meanwhile, further, continuing actions as follows;

1. Arrangement should be made to maintain law and order in strict manner at the incident place and nearby.
2. Arrangement to control unwanted traffic and to divert unwanted traffic via safe route.
3. To post senior police officers near the mishap site.
4. Immediate and continuous announcement to make awareness about emergency among surrounding population.
5. Cordon the area so that the area will not be crowded or blocked by unwanted people.
6. To keep the road clear and to see smooth flow of traffic.
7. To work in consultation with CCR and report the details of real position of each place.
8. To keep and carry out evacuation and remove trapped persons. Moreover, to ensure protection of property in evacuated areas.
9. To divert the person to first air post, casualty reception centre and base hospital according to the situation.
10. To ensure that there is no interruption in the performance of tasks allotted to other emergency services.
11. Communicate the surrounding public instructing them to leave the area and move to the shelters and other safe places as decided, in case of release of toxic gas, the clear instruction should be communicated by wireless set/walkie-talkie through mobile vehicles who should also wear the protective equipment like self-breathing apparatus.
12. Further actions as directed by the LCG authorities.
13. The Emergency Response Diagram for Police Services is given at Annexure-4-C.

4.5.3 MEDICAL & HEALTH DEPARTMENTS

On receipt of information on the incident, the medical coordinator will dispatch medical teams to the incident location from the hospitals.

The major activities of emergency medical teams have to carryout at incident place are indicated as below:

1. Provide medical response in three tier structures.
   - First-Aid posts.
   - Causality reception centres
   - Base hospitals.
2. Provide equipment, ambulance, trauma units, and stretchers. First Aid Kits, etc. as required during emergency.
3. Arrangement for adequate stock of antidotes, life saving drugs and special medicines.
4. Arrange trained manpower for manning the First Aid Posts and running stretcher services The following colour code is proposed to evaluate the victims:

Identification Tags/Bends.

1.	Very Serious	Red.
2.	Conscious and curable	Yellow
3.	Minor injuries	Green
4.	Dead	Black

Field hospitals shall maintain a record of all the patients (as far as possible) so as to enable accounting of personnel and their destinations after triage. The on-scene medical command post shall be under the supervision of the local medical coordinator.

5. Arrange qualified and trained manpower like Doctors, specialist, nurses, pharmacists, compounders, dresses, X-

ray, Laboratory, Blood Bank technicians etc. at base hospital.

6. As morphine, pethidine, spirit etc. will be required in large quantities for preparation and operation purpose, the medical commander should obtain Licenses for stocking additional quantities of these medicines from prescribed authority.
7. Keep in touch with base hospitals from time to time to get details about the progress of treatment of hospitalized victims.
8. Maintain the records in registers, accordingly.
9. The medical coordinator will provide the all the information/details on casualties, treated persons, hospitalisations, dead, First aiders, with medical staff paramedical staff etc to the Chair Person and CCR time to time.
10. The Emergency Response Diagram for Medical &Health Services is given at Annexure-4-D.

4.6 MEMBER -TDO

Immediately rush to the site and assess the situation. In case evacuation required then assist and provide help with consultation with chair person. The actions are illustrated as below;

1. Convince the public of the affected village to evacuate the houses and gather at shelter places, if required.
2. Get the help of local leaders of villages such as Sarpanch, Talati/Clerk or Gram Panchayat and mobilize the required services, asked by Disaster Control Room, such as
    i. Manpower from voluntary organizations.
    ii. Water resources at the accident site.
3. Identify appropriate shelters in the surrounding villages and city area.
4. Evacuation of people from village, if required.

5. Assist the Government village hospitals to accommodate victims and mobilization of victims.
6. Rehabilitate the evacuees back to their homes after the emergency.

4.7 MEMBER -EXPERTS

Large quantities of various chemicals are stored, handled and transported which have different properties. If these chemicals go beyond control & resulted into chemical emergency, the special and specific responding actions/tricks are to be required to control such chemicals. Therefore, chemical-experts can advice specific control measures on this occasion.

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4.8 OTHER MEMBERS

In grave situation of chemical accident, chair person can summon to call any person from govt. or other organisations to carry out specific instructions during emergency.

4.9 OTHER EMERGENCY ARRANGEMENTS

Specialized Material handling equipments may be required to facilitate Emergency Services to carry out their functions effectively, e.g., Rescue Operation from collapsed building, creating approach ways, etc.

Executive Engineer (Roads & Buildings Deptt.) and/or T.D.O. will be in-charge of this wing.

i. Check, regulate, divert or stop the flow of Electricity and Water as per the prevailing situation.
ii. Arrange Heavy Vehicles such as cranes, bull-dozers. Dumpers, Rollers, Generators, Portable pumps etc., as per requirement.
iii. Prepare temporary approach ways, stop or start water flows, Demolish some part of structures for rescue operation, etc. as per requirement.

iv. Arrange fuel for the equipments for longer duration.

v. The Wing can, take the help of RTO, Executive Engineer (PWD) etc., for ensuring the quick and adequate emergency services.

4.10 CENTRAL CONTROL ROOM

a. Functioning of central control room (CCR)

The prime function of CCR is to get correct information and communicate the correct messages or details to the Chair-Person; Emergency services, Members, requisite places/agencies on urgent need-base and follow the instructions. Presently, there is no separate CCR, but control room at collectorate can be utilised for LCG.

b. Emergency Communication System

However, the primary communication channel for an emergency shall comprise of communication through the walkie-talkie available with the District Administration, Police and Fire Services. Additionally, mobile phones, landline telephones and alternate facilities are available with the industries.

c. Public Warning

Public warning can be done by:

- Clarion bell (Domed Brass bell) mounted on Jeep
- Public address system mounted Jeeps; Pre-recorded cassettes/CD can also be used. It should address the type of emergency, what they should do and where they should reach (Safe location).
- Siren installed in the city area should be blown.

c.1 SIREN CODE

1.	*A wailing siren for two minutes*	Alert Siren
2.	*A wailing siren for two minutes for three times at the interval of one minutes*	Evacuation Siren
3.	*A Straight run siren for two minutes*	All Clear

4.11 EMERGENCY COMMUNICATION

The Format for emergency communication is given at Annexure-14.

4.12 SALIENT PROPERTIES OF CERTAIN CHEMICALS

The salient properties of certain chemicals are given at Annexure-10.

4.13 COLOUR CODE SYSTEM FOR PIPE LINES

The colour code system for pipe lines for different substances as per I.S. 2379:1990 is given at Annexure-11.

4.14 LIST OF FIRE STATIONS

The list of Fire stations is given at Annexure-5.

4.15 HOW TO EXTINGUISH A FIRE

The details on extinguishing fire in chemicals at the initial stage are given at Annexure-12.

4.16 DETAILS OF BURNS AND THEIR TREATMENT

The details of burns and their treatment are given at Annexure-13.

4.17 FORMATS

LCG is the Apex body in the industrial pockets and have to maintain certain records mentioned as below; as per C.A.(EPPR)Rules-1996;

ANNEXURE-15---Register for chemical/Industrial accidents occurred in the Industrial Pocket - Bardoli & Mahuva.

ANNEXURE-16----Register for Public Inquiry.

Annexure-17 --- Conduction of mock-drill

CHAPTER - 5

EMERGENCY TRANSPORTATION MANAGEMENT

5.1 INTRODUCTION

Various industrial Units are working at different cluster of the industrial pockets in Vadodara District. Further, many chemical units, whether small or large or big, are receiving or dispatching a variety of hazardous chemicals, in bulk quantity. Therefore, hazards during the transportation can be identified at different stages as described as below;

1. Dispatching the hazardous chemicals by manufactures' units within or outside the District.
2. Receiving the hazardous chemicals to Units/Factories from manufactures located within or outside the District.
3. Receiving hazardous chemicals in Bulk from Bulk- storage terminals through pipelines or dispatching to the users within or outside the District.
4. Transit traffic of hazardous chemicals lorry/ truck/ carrier passing through the major corridors of the District.
5. Temporary or irregular ways of storage of hazardous chemicals at un-authorised places/locations either for forward supplying or repacking or transit stay.

5.2 CENTRAL MOTOR VEHICLE ACT 1988 & RULES-(2001)

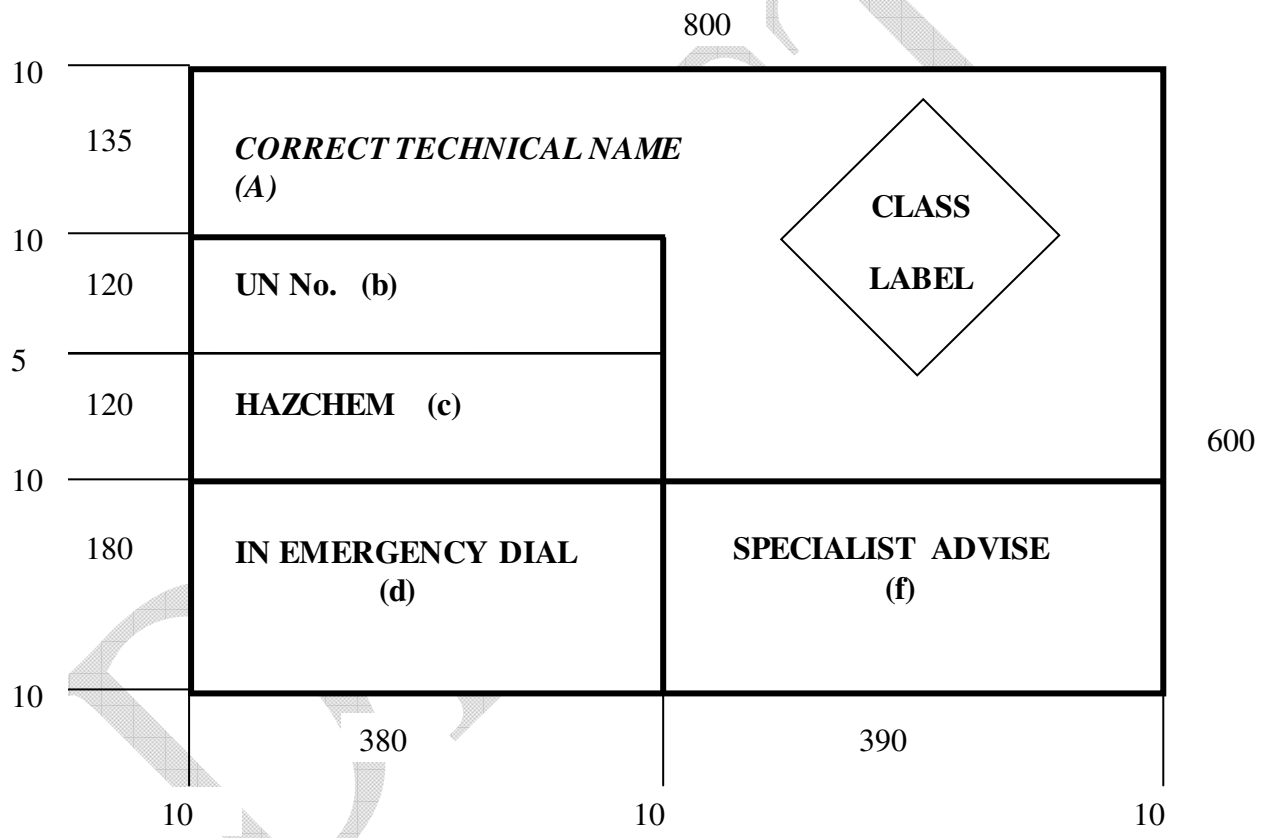
Under the New Act, every Motor Vehicle carrying hazardous substances should comply with certain regulations. Such as,

1. Emergency Information Panel
2. Trem Card
3. Emergency Kit
4. Training

5.2.1 EMERGENCY INFORMATION PANEL

The emergency information panel provides details in the event of emergency. It indicates the correct Technical Name of the substance being transported, its UN No., Hazchem Code and UN Hazard Class Label (Diamond Shaped). The panel also provides emergency telephone no., specialist advice in case of emergency. The vehicle should have emergency information panel on both sides and on the rear.

The size (600 MM x 800 MM) and shape of the panel is shown below:



i. ***Correct Technical Name***

The correct technical name of contain / substance should be indicated at this corner.

ii. ***UN Number***

The relevant UN Hazard Class Label (UN Symbol) has to be displayed on the front part of the vehicle (Central Motor Vehicle Rules 129, 134).

The UN Committee has classified various hazardous substances according to the risk involved. Each hazardous substances included in the list has been allocated a unique four-digit number, which is the substance's UN Number. Since the Numbers are in Arabic Letters, it helps in ready identification of the chemical being transported e.g.

Ammonia	=	1005	Petrol (MS)	=	1203
Chlorine	=	1017	Ethylene Oxide	=	1040
LPG	=	1075	Sulphuric Acid	=	1830
Methanol	=	1230	Benzene		1114
Oleum		1831	Toluene		1294

iii. ***Hazchem Code***

The Hazchem Code is an emergency action code designed by the London Fire Brigade. It enables the fire brigade to know at once the action to be taken in case of fire or spillage e.g.

Ammonia	=	2PE	Petrol (MS)	=	3YE
Chlorine	=	2XE	Ethylene Oxide	=	2PE
LPG	=	2WE	Sulphuric Acid	=	2RE
Methanol	=	2PE	Benzene		3WE
Oleum		4WE	Toluene		3YE

Hazchem Code

1 : Jet

2 : FOG

3 : Foam

4 : Dry Agent

P	V	Full Body Protective Clothing with BA	Dilute
R			
S	V	SBA	
S		SBA for FIRE Only	
T		SBA	
T		SBA for FIRE Only	
W	V	FULL	Contain
X			
Y	V	SBA	
Y		SBA for FIRE Only	
Z		SBA	
Z		SBA for FIRE Only	
E	Consider Evacuation		

V : Can be Violently or even explosively reactive

Full : Full Body Protective Clothing with BA

SBA : Self Breathing Apparatus Plus Protective Gloves

Dilute : May be used Plenty of Water.

Contain : Prevent, by any means, available, Spillage from entering drains or water courses.

P : R : Use Water than Drain into gutter. Use pressured Air suit

S : T : Use SBA Set. Use Water & Drain into gutter

W : X : Use Pressured Suit

Y : Z : Use SBA Set Don't allow effluent water into gutter.

iv. ***In Emergency Dial***

The Telephone No. of the contact person in case of emergency.

v. ***Special Advice***

The fire extinguishing media, special protection system etc. can be given briefly.

4.3.1 Class Label

Chemicals have been grouped into nine basic classes depending on the nature of the hazard. Shaped label bearing a pictorgram for quick hazard recognition classes. It is hazard-warning sign by different Diamond represented numerically from 1 to 9 which are given below:

Class-1	:	Explosives
Class-2	:	Gases, Compressed, Liquefied, Dissolved under pressure or deeply refrigerated
Class-3	:	Flammable Liquids
Class-4	:	Flammable Solids, Substances Liable to Spontaneous Combustion, Substance which on contact with water emit flammable gases.
Class-4.1	:	Flammable Solids
Class-4.2	:	Substances liable to spontaneous combustion
Class-4.3	:	Substances which in contact with water emit flammable gases
Class-5	:	Oxidizing Substances, Organic Peroxides
Class-5.1	:	Oxidizing Substances
Class-5.2	:	Organic Peroxides
Class-6	:	Poisonous (Toxic) & infections substance
Class-6.1	:	Poisonous (Toxic) Substance
Class-7	:	Radioactive Substances
Class-8	:	Corrosives
Class-9	:	Miscellaneous Dangerous Substances

Each United Nations Hazard Class Label has a distinctive diamond. Each label also has a characteristics background colours.

Colour	Hazard Type
Orange	Explosives
Red	Flammable
Blue	Water Reactive
Yellow	Oxidizing Substance
White	Toxic / Infections
Yellow & White	Radio Active
Black & White	Corrosive

4.3.2 SAMPLE :PANEL BOARD & TREM CARD

4.3.2.1 Emergency Information Panel Board Sample (Chlorine) :

1.	Name of Chemical	CHLORINE (CL_2)
2.	UN Nos.	1017
3.	Hazchem Code	2 X E
4.	Emergency Contact Nos.	100
5.	NFPA Hazards	H:3, F:0, R:0, SP: -
6.	Class Label	
7.	Special Advice	Chlorine is greenish yellow Colour, irritating, bleach like chocking odour, non-flammable, but corrosive liquefied gas. Avoid contact use self-contained breathing apparatus neutralise spillages with soda and drain with abundant water. Run away from the gas clouds, in the direction perpendicular to wind direction.

4.3.2.2 Emergency Information Panel Board Sample (LPG)

1.	Name of Chemical	LPG
2.	UN Nos.	1275
3.	Hazchem Code	3WE
4.	Emergency Contact Nos.	100
5.	NFPA Hazards	H:1, F:4, R:0, SP: -
6.	Class Label	
7.	Special Advice	Skin: Liquid on skin causes frostbite. Inhalation: Concentration in air greater than 10% causes dizziness in few minutes. 1% conc. Gives the same symptoms in 10mtr. High concentration causes asphyxiation.

4.3.2.3 TRANSPORT EMERGENCY CARD (ROAD)-Sample

MATERIAL	**CHLORINE** Pale green toxic liquefied gas with characteristic odour
Nature of Hazard	➢ The gas is highly toxic through inhalation or by absorption through skin ➢ Heating will cause pressure rise, severe risk of bursting and subsequent explosion ➢ The gas is corrosive in the presence of water, and can thus cause injury to the eyes and skin ➢ The gas is heavier than air, and will spread along the ground ➢ Increases fire risk. Combustible material (e.g. clothing) ignites more readily and burns fiercely ➢ Reacts with oils, fats or highly combustible substances generating heat, and may cause spontaneous fire or explosion
Protective Devices	➢ Suitable respiratory protective device ➢ Suitable eye protection ➢ Eyewash bottle with clean water ➢ For loose cylinders ➢ Leather or thick textile gloves ➢ Protective boots
	➢ Move vehicle to open ground where practical ➢ Stop engine, isolate electrics ➢ Keep public away from danger ➢ Keep upwind ➢ Put on protective clothing before entering danger area ➢ Ventilate clothing exposed to product ➢ Advise and assist Emergency Services ➢ Do not Allow naked lights ➢ Smoke ➢ Attempt to deal with any fire involving the load, but ➢ minor vehicle fires should be tackled with the vehicle ➢ fire extinguishers, if safe to do so ➢ Enter pits, hollows or troughs
Fire	➢ Keep load cool by spraying with water - significant risk of catastrophic failure due to increasing pressure when exposed to fire ➢ Keep personnel away and upwind
First Aid	First Aid • If substance has got into eyes, immediately wash out with plenty of water for atleast 15 minutes Remove contaminated clothing immediately and drench affected skin with plenty of water Don not applies artificial respiration if patient is breathing • Seek medical treatment when anyone has symptoms apparently due to inhalation or contact with skin or eyes Emergency Services Information PPE • Emergency Services as per vehicle crew. Emergency Action Code requires full protection
Name & Address of Manufacturer	
Contact Nos.	

5.3 TREM CARD

5.3.1 WRITTEN INFORMATION IN TREM CARD

As a precaution against any accident or emergency that may occur during carriage, the driver shall be supplied with instructions in writing specifying concisely;

a) The nature of the danger presented by the dangerous substances carried and the necessary safety measures that must be taken to avert that danger,
b) The action to be taken and treatment to be given in the event of persons coming into contact with the dangerous substances being carried or with any substances which might escape there from;
c) The measures to be taken in case of fire and, in particular, the extinguishing methods and/or agents or groups of extinguishing methods and / or agents not to be used.
d) The measures to be taken in case of breakage or deterioration of packing or of the dangerous substances being carried, particularly where such dangerous substances have spilled over the road.

These instructions shall be supplied to the carrier at the latest when the transport order is given, so as to enable him to take all necessary steps to ensure that the employees concerned are aware of these instructions and are capable of carrying them out efficiently.

5.4 EMERGENCY KIT

The Emergency Kit consists of Personal Protective Equipment, Self Breathing Apparatus, Fire Extinguishers, and Safety Equipments etc. as per statutory requirements, which should keep with the vehicle during transportation of hazardous chemicals.

5.5 TRAINING

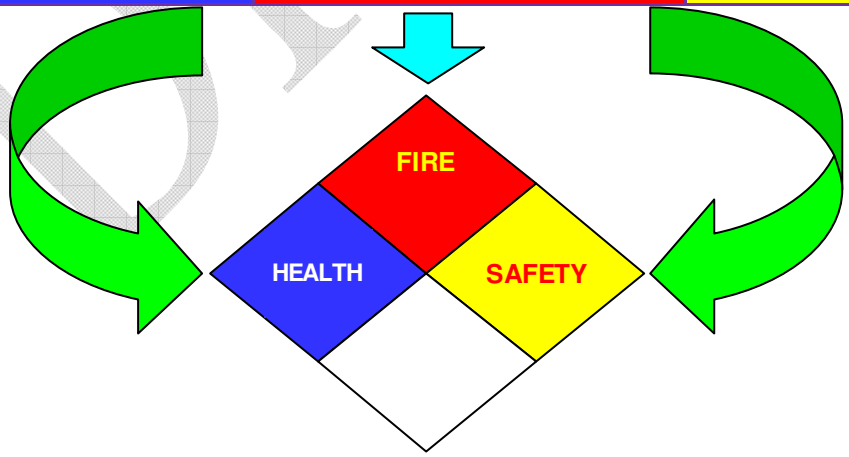
It is necessary to train the drivers, police and fire brigade people in handling of hazardous chemicals and meeting the emergencies arising out of leakages and spillages of chemicals. The lead and initiative should be taken by the manufacturer for training.

Driver has to maintain vehicle, accessories, protective clothing, safety equipments, and Emergency kit in good condition and he should be trained to handle all these equipments effectively. The drivers must be fully conversant with the product they carry. They must be conversant with the Trem Card and get accordingly in an emergency. They should keep the Trem Card in a safe place. Driver should maintain the emergency information panel in position on carriers as specified and prescribed manner. In case of mishap, driver should be reported immediately to the nearest Police Station.

5.6 TRANSPORTATION SIGNALS

Following Systems adopted for hazardous goods transportation to identify quickly the degree of hazards, as adopted from National Fire Prevention Association (NFPA) Standard – 704.

	IDENTIFICATION OF HEALTH HAZARD	IDENTIFICATION OF FLAMMABILITY	IDENTIFICATION OF REACTIVITY
Signal	**Type of Possible Injury**	**Susceptibility to burning**	**Susceptibility to Release of Energy**
4	Materials, which on very short exposure could cause death or major residual injury even though prompt medical treatment, were given.	Materials which will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature and which will burn.	Materials, which are readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
3	Materials, which on short exposure could cause serious temporary or residual injury even through prompt medical treatment, were given.	Liquids and solids that can be ignited under almost all ambient temperature conditions.	Materials that are capable or detonation or explosive reaction but require a strong initiating source or that must be heated under confinement before initiation, or react explosively with water.
2	Materials, which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.	Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.	Materials that are normally unstable and readily undergo violent chemical changes but do not detonate also materials that may react with water violently, or that may form potentially explosive mixtures with water.
1	Materials, which on exposure would cause irritation but only, minor residual injury even if no treatment is given.	Materials that must be pre-heated before ignition can occur.	Materials that are normally stable, but that can become unstable at elevated temperatures and pressures, or that may react with water with some release of energy, but / not violently.
0	Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible	Materials that will not burn.	Materials that are normally stable even under fire explosive conditions and that are not reactive with water.



5.7 CHEMICAL TRANSPORTATION SCENARIOS

As mentioned above, various hazardous chemicals are being transported through out the District. With transportation activity within the District, the potential for accident also increases correspondingly. Accidents scenarios have been visualized for major hazardous chemicals passing through the District and the details are given at Table 5.4. The table provides likely scenario, chemical involved, its quantity, expected area of exposure and name of the MAH unit from where technical expertise could be sought. As transport emergency can happen anywhere in the District, the area and population likely to get affected will depend on the location and prevalent meteorological condition in the area.

5.8 DAMAGE EFFECT

Other factors that will have bearing on the extent of damages are:-

- Rate of chemicals release – lower rates pose lesser risks. As per the guidelines of the Ministry of Environment of Forest (MoEF), catastrophic failure of container has been considered. However, it seldom happens in actual incidents and the material escape from the container at a much lesser rate.
- Location (high population density) – unfavourable
- First response by the driver, if possible- favourable
- prompt action by response agencies – Favourable

5.9 OPERATION SEQUENCE

5.9.1 ANALYSIS OF ACCIDENT SCENARIO

If the vehicle carrying the hazardous chemical meets with a scenario accident, there is likelihood of release of chemical to the atmosphere. Such chemicals may also get released during transportation due to damaged container; however, such possibility is rather remote. In both the events, consequences and extent of damage will vary considerably with location. Typical damage distance, In case of catastrophic Failure of

container of hazardous chemical during transportation would vary with the type of chemical being transported. If it happens in thickly populated area, it could seriously affect population in surrounding area. However, a quick emergency response can reduce the damage to a large extent.

Immediate emergency response would be required to contain the damage, rescue the trapped / injured people, provide medical help to the affected population, evacuate the affected / threatened areas, control of traffic and curious on lookers etc.

5.9.2 CHAIN OF EVENTS

If the driver of the vehicle is safe and is trained to handle transport emergency (he is supposed to received basic training and carry TREMCARD- Transport Emergency card., which gives do's and don'ts during such situation specifically for the chemical being transported), he can be instrumental in providing immediate initial response. He can help in:-

- Conveying the accurate information to the authorities.
- Keeping the onlookers away by shouting at them (that this is a hazardous chemical and they should not come near the truck). Further, he can try and keep away all they sources of ignition.
- Communicating with people in downwind direction so that they move away from gas cloud.

5.9.3 INTIMATION OF INFORMATION

The following information is needed to make the initial decision to handle the situation by police, fire and expert person.

A. The hazardous chemicals / goods involved

1. Chemical Name of hazardous chemicals.
2. Degree of health hazard.
3. Quantity involved & type of container
4. Release, type of containment or Control
5. Vapour/ liquid release. Movement, spread, dispersion.

B. Likely The Public in Vicinity

1. Location / mile stone
2. No of Hutments, Shops, residential area with maximum Number of people, who get/ may get affected.
3. Probable Evacuation Area
4. Arrangement for evacuation / protection
5. Safe shelter or other building etc
6. Authority, Hospitals, Medical treatment etc.

C. Weather Condition

1. General condition of wind & Direction or rain, cold, sun heat etc.
2. Effect of vapour / Liquid
3. Potential to change
4. Effect of production / evacuation etc.

5.10 DISTANCES FOR INITIAL ISOLATION OR PROTECTIVE ACTIONS

Sr. No.	Chemical Name	SMALL SPILLS (From a small package of small leak from a large package)			LARGE SPILL (From a large package or from many small packages)		
		First Isolate in all Directions (Mts.)	Then Protect persons in Downwind during (Mtr.)		First Isolate in all Directions (Mts.)	Then Protect persons in Downwind during (Mtr.)	
		Day	Day	Night	Day	Day	Night
1.	Chlorine	30	200	1200	240	2400	7400
2.	Ethylene Oxide	30	100	200	90	800	2400
3.	Hydrogen Chloride	30	100	400	360	3600	10400
4.	Liquid Ammonia, Anhydrous Ammonia	30	100	100	60	600	2200
5.	LPG	30	100	200	90	800	2400
6.	Methyl Mercaptan	30	100	200	150	1300	4500
7.	Nitric Oxide	30	200	800	60	600	2700
8.	Sulphur Dioxide	30	300	1200	210	2000	6300
9.	Sulphur Trioxide (Oleum)	60	400	1000	330	2500	6500
10.	Hydrogen Chloride	30	100	400	360	3600	10400
11.	Hydrogen Bromide	30	100	500	180	1800	5700
12.	Hydrogen Fluoride	30	100	500	210	1900	4300
13.	Hydrogen Cyanide	30	100	400	150	1300	3700

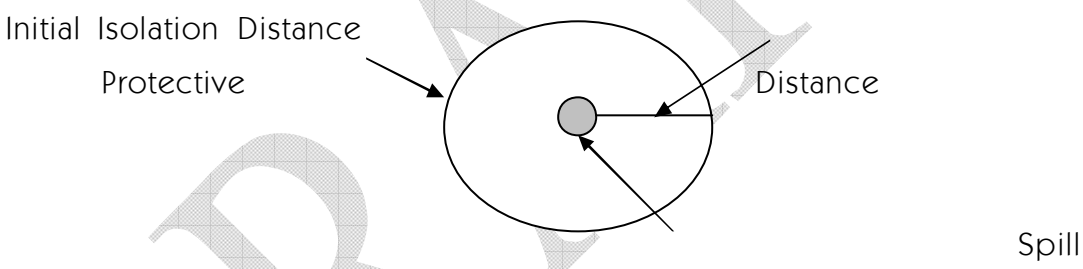
5.11 HOW TO USE ABOVE TABLE

1. The responder should always have:
   - Identified the material by its name
   - Read the guide for that material and taken the emergency actions recommended
   - Noted the wind direction

2. Look in this table, use the entry with the largest protective action distances
3. Determine if the incident involves a SMALL or LARGE spill and if DAY or NIGHT. Generally a SMALL SPILL is one which involves a single, small package (i.e. up to a 208 litre drum), a small

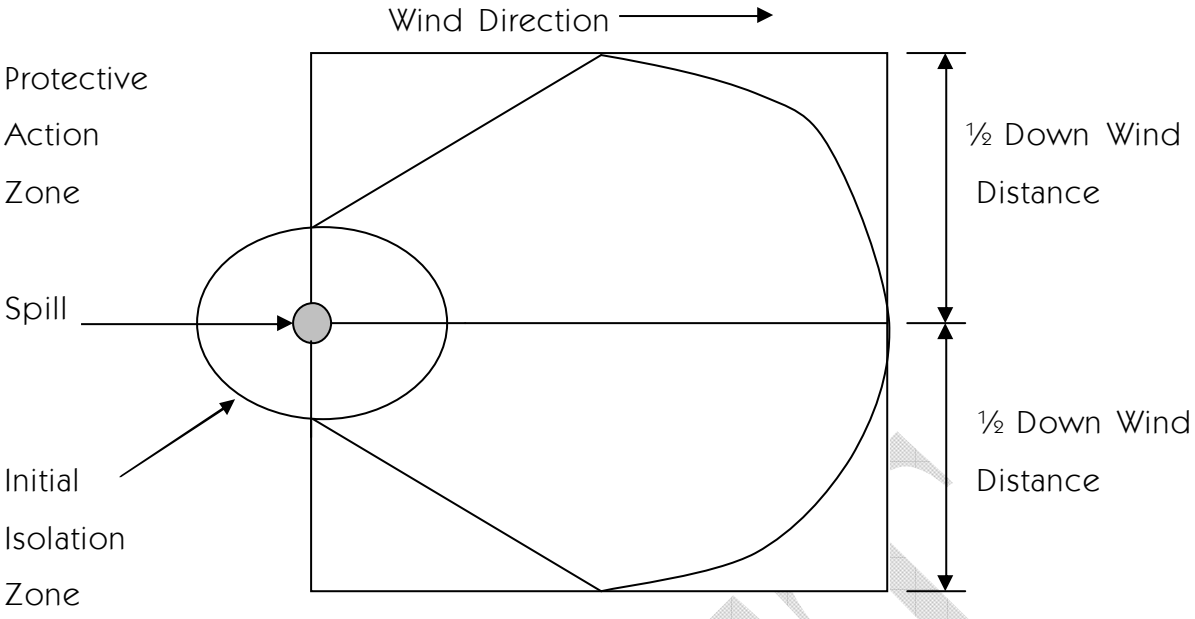
cylinder, or a small leak from a large package. A LARGE SPILL is one, which involves a spill from a large package, or multiple spills from many small packages. DAY is any time after sunrise and before sunset. NIGHT is any time between sunset and sunrise.

4. Look up the initial ISOLATION distance. Direct all persons to move, in a cross wind direction, away from the spill to the distance specified.
5. Next, look up the initial PROTECTIVE ACTION DISTANCE shown in the table. For a given dangerous goods, spill size, and whether day or night, the table gives the downwind distance-in kilometres for which protective action should be considered. For practical purposes, the Protective Action Zone (i.e. the area in which people are at risk of harmful exposure) is a square, whose length and width are the same as the downwind distance shown in the table.



6. Initial Protective Actions to the extent possible, beginning with those closest to the spill site and working away from the site in the downwind direction. When a water reactive which producing material is spilled in to a river or stream, the source of the toxic gas may move with the current or stretch from the spill point downstream for a substantial distance. The shape of the area in which protective actions should be taken (the Protective Action Zone) is shown in this figure. The spill is located at the centre of the small circle. The larger circle represents the INITIAL ISOLATION ZONE around the spill.

7. Call the emergency response telephone number on the TREMCARD as soon as possible for additional information on the material, safety precautions and imitation procedures.



5.12 SCENARIO AND ITS EFFECTS

Sr. No.	Transport Accident Scenario	Area Likely to be Affected
1.	Failure of Chlorine tonner	1 to 1.4 km downwind
2.	Failure of acid / alkali tanker	Immediate surrounding and burns to person coming in direct contact with the substance.
3.	Ammonia leak from cylinder	Varying, depending on the capacity of the cylinder but not more than 1 km
4.	Escape of explosive gases from cylinder followed by explosion	Explosion may cause over pressure up to 50 m for a short duration, However, pieces of damaged cylinder may travel up to 100 m from the accident site.
5.	Spill / leak of flammable petroleum products followed by fire	Thermal radiation effects of unconfined pool fire will be felt up to 25 m from the pool edge for the duration of fire
6.	Spill / leak of solvents and other flammable chemicals such as toluene, methanol, benzene and xylene followed by fire	Thermal radiation effects of unconfined pool fire will be felt up to 15 m from the pool edge for the duration of fire
7	Leak of Nitrogen	Immediate surrounding area for asphyxiation hazard

CHAPTER - 6

POST EMERGENCY ACTIONS

6.1 INTRODUCTION

Once the situation at the site is under control, the spill/leak has been plugged, fire has been extinguished, the emission of vapours to the atmosphere has been effectively checked and a SAFE signal has been passed its time for the follow up exercise. Details of post-emergency activities are given below in order of priority.

6.2 INSPECTION AFTER FIRE OR EXPLOSION

The large fires can have major effects over a vast area. Similarly major explosion could damage or destroy numerous buildings and any nearby bridges or tunnels. In either case, residents of partially damaged buildings will want to know, if the structures are safe to occupy or they await repairs. Questions pertaining to the safety of highway or railway bridges must be resolved quickly to avoid traffic complications.

It is important to note that inspection personnel may require special precautions (i.e., chemical protective gear) in addition to normal safety equipment and in those cases where the structure may still be contaminated by hazardous residues.

Technical coordinators shall be responsible for coordinating inspection of the structural integrity of damaged buildings, bridges, or other structures in the aftermath of a fire or explosion through expert agencies.

6.3 POST-INCIDENT TESTING FOR CONTAMINATION

To some extent, this item overlaps with monitoring of concentrations. However, activity in "Action Plan" covers sampling and analysis during the initial phases of a response action while this one is concerned with the potential for persistent after effects.

Personnel of the Gujarat Pollution Control Board shall undertake to check homes, stored foods, crops, water (ground & surface) and animals that may become part of the human food chain for possible chemical contamination. Help may be sought from the industries having capabilities for monitoring/ testing of contaminant in the target items.

6.4 WASTE DISPOSAL

After a major accident, it may become necessary for public authorities to undertake disposal of hazardous wastes. This requires knowledge of Hazardous Waste (Management & Handling) Rules, 1989 (as amended in 2000 and 2003) of the Ministry of Environment & Forests, Govt. of India. The location of approved and authorized disposal sites and the proper procedures for transporting and transferring wastes to these sites have also to be taken care of. Local authorities should seek assistance from the state department of environment. The items unfit for human consumption will also form part of the Hazardous waste, which needs to be disposed off in accordance with the above mentioned Rules.

6.5 CLEANUP OF DEAD OR CONTAMINATED LIVESTOCK OR WILDLIFE

Contaminated animals must be sent to veterinary hospital for decontamination & treatment. A large number of animal carcasses, hundreds of cows or chickens or thousands of fish, can pose a variety of health hazards. Emergency response plans do not typically address this topic, possibly because it is somewhat distasteful, but the topic is worthy of consideration during the planning process where applicable.

Where oil spills may contaminate waterfowl, consideration might be given to the formation of work crews to collect, clean, and care for the animals under the direction of experienced personnel. State and local public works agencies can provide assistance in planning for this activity. Local veterinarians and animal conservation groups may also be helpful, but in all cases, it is the responsibility of medical coordinator to ensure that personnel will not be placed at risk of adverse safety or health impacts by their actions.

6.6 PROVISION OF ALTERNATE WATER SUPPLIES

There are a number of circumstances under which a potable water supply may become unfit for human consumption for a time and require replacement. This is most commonly accomplished by bringing in supplies of bottled water and/or tankers/trailers capable of carrying water. The later are available from local Municipal Corporation. Tankers carrying milk are another possibility for consideration once thoroughly cleaned. It is the responsibility of transport coordinator in association with the social workers for arranging potable water for consumption of personnel engaged at the incident site. The potential sources of potable water are wells of water intake point of River, and ground water from neighbouring villages/towns/agricultural areas where possibility of ground water pollution due to spillage of contaminants is minimum.

6.7 RE-ENTRY INTO EVACUATED AREAS

Based on the assessment of the situation at the site, the LCG would take decision on the termination of emergency. Before this, however, several issues need to be resolved by the members of LCG. Re-entry being again as complex as the evacuation operation, would require the respective coordinators to perform their functions such as transportation of evacuees back to their respective residential areas, restoration of electricity, gas, water supplies, post-accident monitoring of concentration, etc. The issues/activities thus required are listed at

Table Below in order of priority. However, as some of these are parallel activities, the decision should be taken based on actual site conditions.

The activities listed below are as illustration and only those, which are essential for return of the normalcy. However, as the last item suggests, regular training to all sections of the society is also of equal importance.

Table : Post Emergency Activities

Activity	Responsibility
Check the industrial unit for possible secondary effect of delayed relapse.	Technical experts
Provide notification at the shelters of termination of emergency	Communications Coordinator
Restoration of water, electricity and gas supplies	Utilities coordinator
Arrange for transportation of evacuees back to residence	Transportation coordinator
Restoration of law and order in the affected areas	Security coordinator
Establish grievance cell	Liaison & PR coordinator and chairman of LCG
Hold press conference	Public Relations Coordinator
Arrange for providing interim relief to the affected people	SDM
Undertake accident investigation and documentation	Technical coordinator
Arrange further relief to the affected people based on claim applications	District Collector
Plan updating, if so required	LCG
Provide training to community and staff	LCG

6.8 REPORT PREPARATION

A report on chemical accident shall be prepared and to be submitted to the DCG. Further, if Mock drill is conducted, then the report of the same shall be submitted to DCG.

CHAPTER - 7

EMERGENCY INSTRUCTION TO THE GENERAL PUBLIC

7.1 THE NOTIFICATION OF EMERGENCY

The system of declaration of emergency are illustrated to announce / alert or alarm the public as below;

1. Public address system
2. Blow horns/ Bells
3. Sirens / Hooters
4. Telephone message / Fax Messages / Hot lines/ Pager / E-Mails / Mobile Phone / Satellite systems
5. Sending messages through a messengers
6. Rushing personally to the Central Control Room or to the nearest Police Department or Fire Department for declaration of emergency
7. Raising of Flag for denoting the level of natural calamities
8. Ham Radio
9. VHF link
10. By any other source by which information can reach to the public in time.

7.2 CATEGORY OF ALARM SYSTEMS

The following alarm system may be considered which will identify the various level of emergency.

7.2.1 FIRST LEVEL WARNING (MAJOR FIRE)

- For an accident / incident within the unit
- Hooter / Siren –A wailing siren for two minutes

7.2.2 SECOND LEVEL WARNING

When the District Authority receives information that a toxic or flammable gas has leaked then the siren has to be sounded in order to facilitate early evacuations from the unit.

- Siren – A wailing siren for two minutes for three times at the interval of one minutes i.e. (wailing siren 2 min + gap 1 min +wailing siren 2 min + gap 1 min + wailing siren 2 min) Total duration of Disaster siren to be eight minutes.

7.2.3 THIRD LEVEL WARNING (ALL CLEAR)

When the District Authority considers that the accident / incident is under control, emergency is withdrawing and it is safe for re-entry.

- Siren – A Straight run siren for two minutes.

Testing : The siren must be tested at least once a week.

7.3 GENERAL INSTRUCTION TO THE PUBLIC

In case of a major chemical emergency and it may affect areas outside the works/factory-premises, the surrounding public will be alerted with public address system/or by Police or Government Authorities or nearby industrial concerns. The siren / hooter will blow, to indicate the type of emergency situation.

Announcement will indicate type of emergency arise, if possible to hear or start the Radio / TV for further instruction & act accordingly. the public have to take prompt actions to protect them-selves and rush to the safe shelter as instructed by the authority.

First of all to ascertain/confirm, which type of emergency arise:

a. Fire
b. Explosion
c. Gas Leakage / Release (Whether flammable, toxic or poisonous)

d. Collapse of Building, Bursting of Vessel etc.

e. Natural Calamities

In case of Gas Leakage/dispersion type chemical incidence, then to know the type of gas, whether flammable, toxic or poisonous?

The following actions are suggested as per prevailing situation: Otherwise follow the instruction as issued by the authority;

7.3.1 FLAMMABLE GAS:

1. Be calm, don't get panicky.
2. Do not light Bidi / Cigarette / Lighter etc.
3. Shut down open flame, gas, and electrical instruments or any source of ignition.
4. Do not move any vehicle in the area.
5. Do not go near the incident & don't allow any others.
6. Shut down the windows, doors etc & seat open ground or terrace.
7. Follow the instruction as directed by the authority.

7.3.2 TOXIC OR POISONOUS GAS :

1. Cover your nose with wet hand kerchief / cloth and breathe through it.
2. Come out in open, check the wind direction and move away quickly in perpendicular direction of wind. (cross wind direction)
3. Immediately go & try to get to a higher elevation, if gas is heavier than air (like chlorine, as it settle in low lying area).
4. Follow the instruction and reach safe shelter as instructed notified by Government Authority or Public authority.

7.3.3 GENERAL INSTRUCTION:

(A) DO'S

a. Listen radio, T.V. or Public Addressing System.

b. Emergency will be communicated by public addressing system /TV/ Radio or siren (Siren-code wailing sound for one minute).

c. Follow the instruction & convey to others accordingly.

d. On announcement of withdrawal of emergency or clearance Siren, start your routine work.

e. On enquiry, deposit your statement as required by authority at the time of investigating the incident.

f. Co-operate, Help and Assist the person(s) / authority handling the emergency and rescue operation.

(B) DON'T

1. Do not get panicky, be calm.
2. Do not approach the site of incident as a spectator.
3. Do not approach unnecessarily for information or more enquiries.
4. Do not allow unnecessarily crowd nearby incident place.
5. Do not believe in rumours unnecessarily.

CHAPTER - 8

MOCK DRILL / REHEARSAL / EXERCISE

8.1 SUBJECT

Exercise / Rehearsal / Simulation on Off-Site Emergency Plan, Considering any one of the event related with hazardous chemical which may create maximum credible scenario.

8.2 AIM

It is necessary that all aspect of emergency plan is tested, often to ensure that they carry out their responsibility & function as specified and in particular to:

8.2.1 Test the response from emergency services, and other govt. departments, local agencies, volunteer groups, media etc.

8.2.2 Test and evaluate the interaction of various agencies / authorities involved and ensure that all components are properly coordinated.

8.2.3 Evaluate the available resources, equipments, its effectiveness, accuracy etc.

8.2.4 Gain experience to create the confidence to handle & control the emergency amongst the participating persons, members and others.

8.3 PROTOCOL FOR CONDUCTING EMERGENCY DRILL/EXERCISE

Carrying out emergency drill, commonly called as exercise, periodically is necessary to ensure that the emergency plan elements are still applicable and the response personnel are aware of their roles in relation to the other responding agencies. Drill/Exercise/Rehearsal is a tool and not an end point in

preparedness. Hence, testing of Off-site Emergency Plan through a drill is an integral part of the emergency planning & preparedness. Basically this involves three types of activities.

8.3.1 Preparatory

It includes integral functions of Planning, training, and exercising. Further, preparation of blue print with scenario, definite place of incident, list of involved persons& their roles, emergency contact numbers, time sequences, Role of all agencies/participants/Govt Department, involved chemicals & quantity and MSDS, Prevailing weather conditions, type of injuries, nos. of injuries, evacuation method, announcement, type of fire fighting, parking arrangement, adequate to meet anticipated needs by conducting a Drill. Identify Evaluators, appointing observers, Conducting Table Top Exercise, etc.

8.3.2 Actual Conduct

1. Ensure all participants and observers are available at predetermined places.
2. Activate Emergency Control Centre.

   Keep the exercise on Schedule and terminate the drill at the specified end-time.
3. Post-Drill Activities:

   A properly conducted debriefing is absolutely critical for a successful drill. It helps to identify areas for improvement, participants' feedback and path forward for further exercises.

8.4 AUTHORITY OF EXERCISE / REHEARSAL

The chair person is hold to assume responsibilities & make decisions as per legitimate. The member-secretary will works as co-ordinators for mock drill purpose.

8.5 TABLE TOP DISCUSSION

The first part of exercise is 'Table Top' exercises to test that emergency plan do not interrupt the day-to-day running of their concerns. This will identify the difficulties involved and practical approaches. The scenarios will be decided and consideration shall be given to live practical involving all concerned at suitable intervals, in addition to those of a theoretical nature. Care should be taken as the mock drill shall not create any panicky to any person or injury to any person.

8.6 BLUE PRINT

Basically there are three types of Activities for conducting Mock-Drills,

1. Preparatory,
2. Actual Conduct,
3. Post- Drill Activities.

A blue print will be prepared as guideline to act, for a selected scenario. The details, maps, affected areas, role & responsibility will be specific and information will be supplied to all concerned persons. The scenario will be explained by co-ordinator/member secretary. The Off Site Emergency Plan will be helpful.

8.7 CODE-NAME FOR REHEARSAL

The code name shall be give to identify the case of rehearsal not real incident. So that, on getting message there will be no panicky amongst the operative person. If real emergency arise, then there will be no code-name. Further, the code name will be announced to conveying the message to authority, operative persons, etc.

8.8 NATURE

Origin, Date & time, location and Duration of exercise etc. will be pre-decided in particular manner.

8.9 AFFECTED AREA

It is the indication of the spread of disaster. This will be reflected in Blue print & give details of original place, units, surrounding identities, villages, roads, locations etc.

8.10 EMERGENCY CONTROL CENTRE

An Emergency Control Centre will be established for exercise purpose where communication & other activities can be performed. The control center will have emergency facilities. The required documents like Off-Site Emergency Plan, details on weather conditions, list of persons to participate, emergency scenario, maps, affected areas, emergency telephone numbers, list of hospitals, list of emergency vehicle & equipment will be kept ready. An experienced & expert person will be posted in Control Room.

8.11 PREPARATION STAGE

The responsibilities & duties will be allotted to each group, services and involving all personnel. Educative meeting will be arranged to explain the role of each participant. Blue print, scenarios and arrangements will be discussed at large. Charts, maps, Posters, Banners etc. will be prepared for good performance.

8.12 RESOURCES AND FACILITIES

Certain essential facilities shall be provided to the participants as required during actual emergency period. Further, adequate resources shall be made available to handle the situation. The some dummy-person have to select as to play and act as dead, serious injured, minor injury for purpose of realization of scenario, and they will be identified by colour badges like, RED indicates as dead, GREEN indicates as immediate admission to the hospital for operation, YELLOW indicates first aid treatment, WHITE indicates no physical injury. The Experienced person shall be invited as OBSERVERS and separate identity cards shall be issued to them.

8.13 SEQUENTIAL ACTIONS

The whole exercise /rehearsal will be arranged in sequential actions as per off-site emergency plan. Thus rehearsal will be conducted, as actual performance.

8.14 OBSERVATIONS

The outsiders / third party will perform the role of observers and they will submit their reports on various site- observations with shortcomings & good features.

8.15 DE-BRIEF MEETING

On completion of exercise, a de-brief meeting will convene to discuss the conducted exercise, give views on performance of each areas; explain difficulties, resources, limitation, planning etc. All these observations, with corrective steps will be noted & reports will be prepared.

8.16 PHOTOGRAPHS, VIDEO & PRESS COVERAGE

Photography, vediography will be carried out for the work performed. The reports of such exercise will be sent to press for coverage. Leaflets and Pamphlets will be issued to the public to educate them for the emergency.

8.17 FORMAT FOR REHEARSAL / EXERCISE / MOCK DRILL

A format for rehearsal / exercise / mock drill is given in Annexure-17.

8.18 PAST EXERCISE / MOCK DRILL

A detail on past exercise / mock drill conducted is to be maintain in the register form.

8.19 REPORT

Report on conducted mock-drill shall be submitted to DCG and other authorities.

OFF SITE EMERGENCY PLAN

PART – II

ANNEXURE
SECTION

BARDOLI & MAHUVA LOCAL CRISIS GROUP

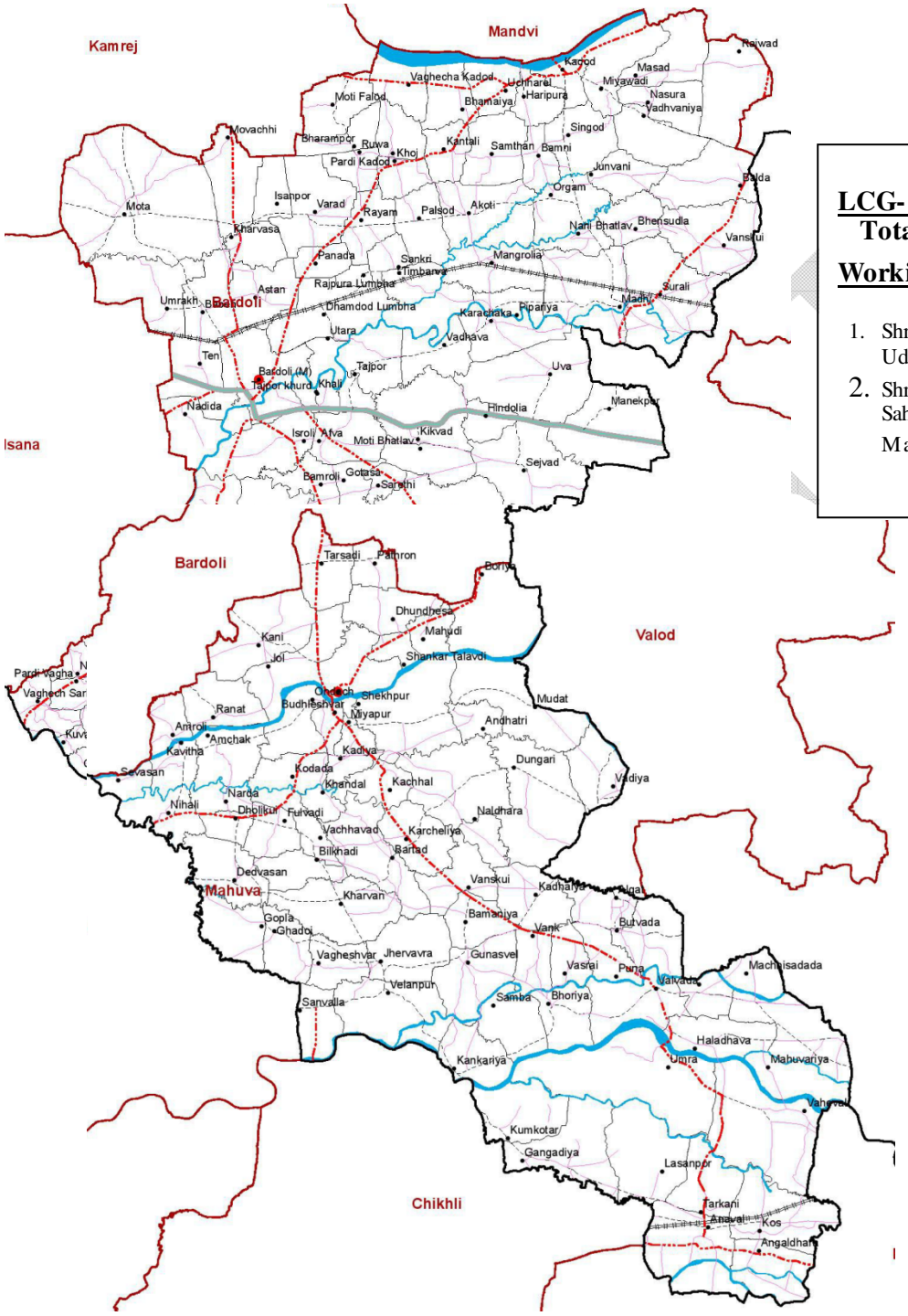
: Prepared By :

LOCAL CRISIS GROUP
BARDOLI & MAHUVA INDUSTRIAL POCKET

SEPTEMBER-2024

ANNEXURE – 1

MAP OF SHOWING MAH UNIT LOCATION (LCG – BARDOLI & MAHUVA)



LCG- Bardoli & Mahuva
Total -2

Working – 2

1. Shree Madhi Vibhag Khand Udyog Sahakari Mandli Ltd.
2. Shree Mahuva Pradesh Sahkari Khand Udhyog Mandli Ltd.

OFF-SITE EMERGENCY PLAN

BARDOLI & MAHUVA LOCAL CRISIS GROUP

ANNEXURE –2

BARDOLI & MAHUVA LOCAL CRISIS GROUP

EMERGENCY TELEPHONE NUMBERS

Sr. No.	Name of Department / Agency		STD Code	Contact Telephone Number
1	2		3	4
A.	**EMERGENCY CONTROL CENTRE**			
	1.	Disaster Management Cell, Collector Office	0261	2465112 (M. 9913072617)
	2.	Emergency Control Room, SMC	0261	2422285 (M. 9724345553)
	3.	Fire Control Room, SMC	0261	2414139 (M. 97243 45510)
	4.	Police Control Room	0261	0261-2241301-302-303 (M. 992595000)
	5.	Emergency Ambulance		108
B.	**COLLECTORALAY, SURAT (JILLA SEVA SADAN)**			
	1.	District Magistrate & Collector, Surat	0261	2655151, 2652525
	2.	Residence Additional Collector, Surat	0261	2669200, 2660011
	3.	Mamlatdar – Bardoli	02621	220024
	4.	Mamlatdar – Mahuva	02625	255721
	5.	Prant Officer (Bardoli)	02622	221224
C.	**PANCHAYAT**			
	1.	District Development Officer	0261	2422160
	2.	Dy.D.D.O.	0261	2422160
	3.	T.D.O., Bardoli	02622	221618
	4.	T.D.O., Mahuva	02625	255722
D.	**POLICE DEPARTMENT**			
	1.	Commissioner of Police	0261	2463939-40 (2667322 2668373, M. 99784 06271)
	2.	Additional Police Commissioner (ADMIN)	0261	2463636
	3.	Deputy Police Commissioner North	0261	2463637
	4.	Deputy Police Commissioner West & Traffic	0261	2463839
	5.	Deputy Police Commissioner East	0261	2554760
	6.	Police Inspector control	0261	2462600
E.	**FIRE BRIGADE /DEPARTMENT**			
	1.	Fire Control Room (Main)	0261	0261- 2414139 / 2414195 / 2414196. 101 / 102 EXT. 324 (M.97243 46022)
	2.	Chief Fire Officer, SMC, Surat	0261	2422285, (M) 97243 45508
	3.	Fire & Accident	0261	101
	4.	Ambulance (SMC)	0261	102
	5.	Fire Station, Muglisara (Head Qurters)	0261	2400172, 2423750/413
F	**Surat Municipal Corporation**			
	1.	Municipal Commissioner (Shri. Banchhanidhi Pani, IAS)	0261	(O) 2422244,
	2.	Municipal Office, PAB Extn Board	0261	2423751-2423756, 2422285-2422287
	3.	Dy. Municipal Commissioner (Gen)	0261	2423340,
	4.	Dy. Municipal Commissioner (Sp.)	0261	2422221,
G.	**MEDICAL & HEALTH**			
	1.	Medical Superintendent, New Civil Hospital, Surat	0261	2244985, 2244456-59
	2.	District Health Officer, District Panchayat, Surat	0261	2430589
	3.	Old Civil Hospital, Surat	0261	2479311, 2479610
	4.	New Civil Hospital, Surat	0261	2244456 to 59
	5.	Mahavir Hospital, Surat	0261	2332829 to 32
	6.	Surat General Hospital, Surat	0261	2479791
	7.	Maskati Hospital, Surat	0261	2420412, 9724346065 -66
	8.	ESIC General Hospital, Majura Gate, Surat	0261	2244110

ANNEXURE –2
Continue…

BARDOLI & MAHUVA LOCAL CRISIS GROUP
EMERGENCY TELEPHONE NUMBERS

Sr. No.	Name of Department / Agency		STD Code	Contact Telephone Number
1	2			
H.	**GOVERNMENT**			
	1.	Joint Director, Industrial Safety & Health, Surat	0261	2472422, 2473501 (M. 9898630454)
	2.	DY.. Director, Industrial Safety & Health, Surat	0261	2473501, 2472422 (M : 6351395434)
	3.	Regional Officer, GPCB, Surat	0261	2442696
	4.	Regional Manager, GIDC Surat	0261	2568948, 2667051
	5.	Joint Director, District Agriculture Office	0261	2425751
	6.	District Information Officer, Surat	0261	2479177, 2474423
	7.	Chief Civil Defense, Surat	0261	2464102
	8.	Commander- Home Guard	0261	2479195
I.	**OTHER DEPARTMENT, ORGANIZATION**			
	1.	Torrent Power Ltd.	0261	2428281 -2428283
	2.	E.E. Ind. Divn. South Guj. Vij. Co. Ltd- Pandesara	0261	2277248
	3.	South Guj. Vij. Co. Ltd – Rander-1 Rander-2	0261	Rander-1 - 2776122 Rander-2 - 2762670

ANNEXURE – 3

BARDOLI & MAHUVA LOCAL CRISIS GROUP

COMPOSITION OF LOCAL CRISIS GROUP- BARDOLI & MAHUVA

Sr. No.	Designation	Position in LCG	Address Office	Telephone Numbers		E-mail
				Office	Residence/ Mobile	
1	2	3	4	5	6	7
1.	Sub Divisional Magistrate (Mr. Smit Lodha, IAS)	Chair Person	Office Of The SDM - Bardoli	(O) 02622-221 124	(M) 70280 20108	19.prantbardoli@gmail.com collector-sur@gujaratgovernment.in colsurat@guj.nic.in
2.	Mr. S.G. Patel	Member Secretary	Jila Seva Sadan – 2. Sixth Floor, Athwalines, Surat	(O) 0261-2659501	(M) 9033729025	Jtdish-sur@gujarat.gov.in
3.	Mamlatdar – Bardoli (Mr. Pratikkumar F. Patel)	Member	Mamlatdar Office Bardoli	(O) 02622-220024	(R) 02622-255738 (M) 99784 04045	mam-bardoli@gujarat.gov.in
4.	Alternative Contact - Mamlatdar Office Bardoli (Mr. Rajeshbhai Parmar (Dy. Mamlatdar)	Member	Mamlatdar Office Bardoli	(O) 02622-220024	M. 9825775933	mam-bardoli@gujarat.gov.in
5.	Mamlatdar – Mahuva (Mr. D.V. Gamit)	Member	Mamlatdar Office Mahuva	(O) 02625-220024	M. 81412 50313	mam-mahuva@gujarat.gov.in
6.	Alternative Contact - Mamlatdar Office Bardoli (Mr. T.N. Patel)	Member	Mamlatdar Office Mahuva	(O) 02625-220024	(M) 9909968111	mam-mahuva@gujarat.gov.in
7.	Police Inspector Bardoli (Mr. P.V. Patel)	Member	Police Station, Bardoli	(O) 02622-220168	(M) 99789 21234	polstn-bar-sur@gujarat.gov.in
8.	Police Sub Inspector Bardoli (Mr. M.B. Aahir)	Member	Police Station, Bardoli	(O) 02622-220168	(M) 83203 94145	polstn-bar-sur@gujarat.gov.in
9.	Police Sub Inspector Mahuva (Mr. B.B. Pardhane)	Member	Police Station, Mahuva	(O) 02625-255733	(M) 90999 27736	polstn-mahuva-sur@gujarat.gov.in
10.	Chief Officer Bardoli (Mr. Vijaykumar N. Parikh)	Member	Bardoli Nagar Palika, Bardoli	(O) 02622-220085	(M) 98251 06060	---
11.	Fire Officer (Mr. P. B. Gadhavi)	Member	Fire Station, Bardoli	(O) 02622-220101	(M) 99743 35667	---
12.	TDO – Bardoli (Mr. R.H. Rathava (I/C))	Member	Bardoli Taluka Panchayat, Bardoli	(O) 02622-220046	(M) 75670 15957	tdo-bardoli@gujarat.gov.in

ANNEXURE – 3
Continue…

BARDOLI & MAHUVA LOCAL CRISIS GROUP

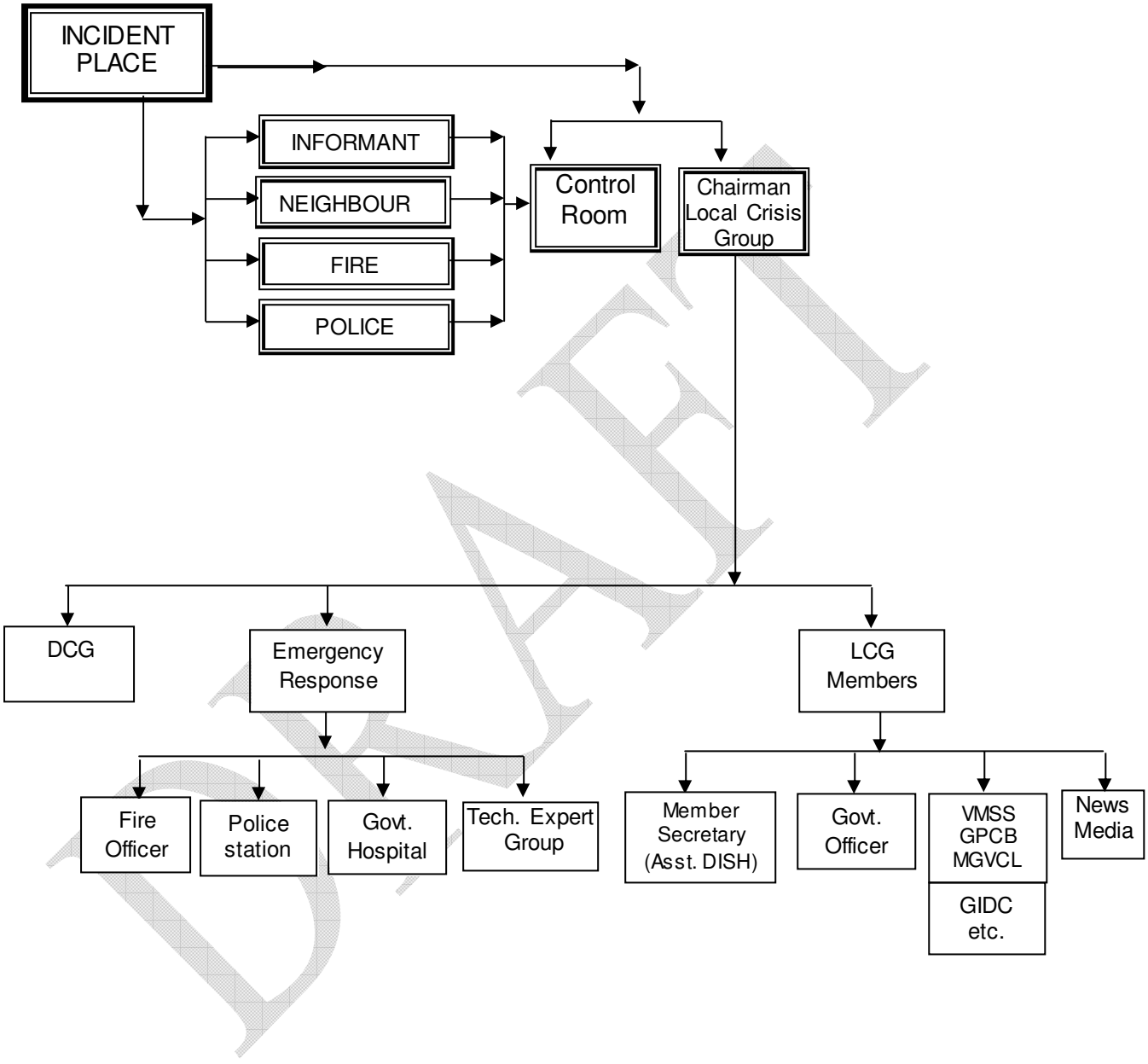
COMPOSITION OF LOCAL CRISIS GROUP- BARDOLI & MAHUVA

Sr. No.	Designation	Position in LCG	Address Office	Telephone Numbers		E-mail
				Office	Residence/ Mobile	
1	2	3	4	5	6	7
13.	TDO – Mahuva (Mr. R.H. Rathava)	Member	Mahuva Taluka Panchayat, Mahuva	(O) 02622-255722	(M) 75670 15957	tdo-mahuva@gujarat.gov.in
14.	Dist. Health Officer (Dr. H. J. Chaudhari)	Member	Jilla Panchayat Bhavan, Surat	(O) 0261 – 242 5751	(M) 97277 09501	---
15.	Spdt. Civil (Dr. Ganesh Govekar)	Member	Superintendent New Civil Hospital-Surat	(O) (0261) 2244456/57		---
16.	Petroleum And Explosive Safety Organisation (Dr. Mrs. S. Sharma Dy. Director- PESO Vadodara)	Member	(O) 8 Th Floor, Yashkamal Bil. Vadodara	(O)(0265)2361 035,2225159		ssharma@explosives.gov.in
17.	Pollution Control Board (Regional Officer) (Mr. Murlikishan Pasadi)	Member	338, Belgium Square, Surat	(O) 0261 – 244 2696	(R) 0261- 242 9733 (M) 98250 07649	gpcb-sur@gujarat.gov.in
18.	Regional Transport Officer (Mr. H.A. Patel)	Member	Rto Office, Surat	(O) 0261 – 2977191 (M) 9913977997		www. rtosurat. gov.in
19.	Technical Experts (Mr. Bhavsar)	Member	Bardoli Sugar	(O) 02622-220170/72	(M) 94278 51755	---
20.	Technical Experts (Mr. Dipak S. Patel)	Member	Mahuva Sugar	(O) 02625-256846	(M) 98794 91285	---
21.	Cost Guard – Daman (Mr.S.K.Bharthariya, Commanding Officer)	Member	Daman	(O) 0260 – 2405703		---

ANNEXURE – 4-A

BARDOLI & MAHUVA LOCAL CRISIS GROUP

COMMAND & RESPONSE DIAGRAM: CHAIR PERSON

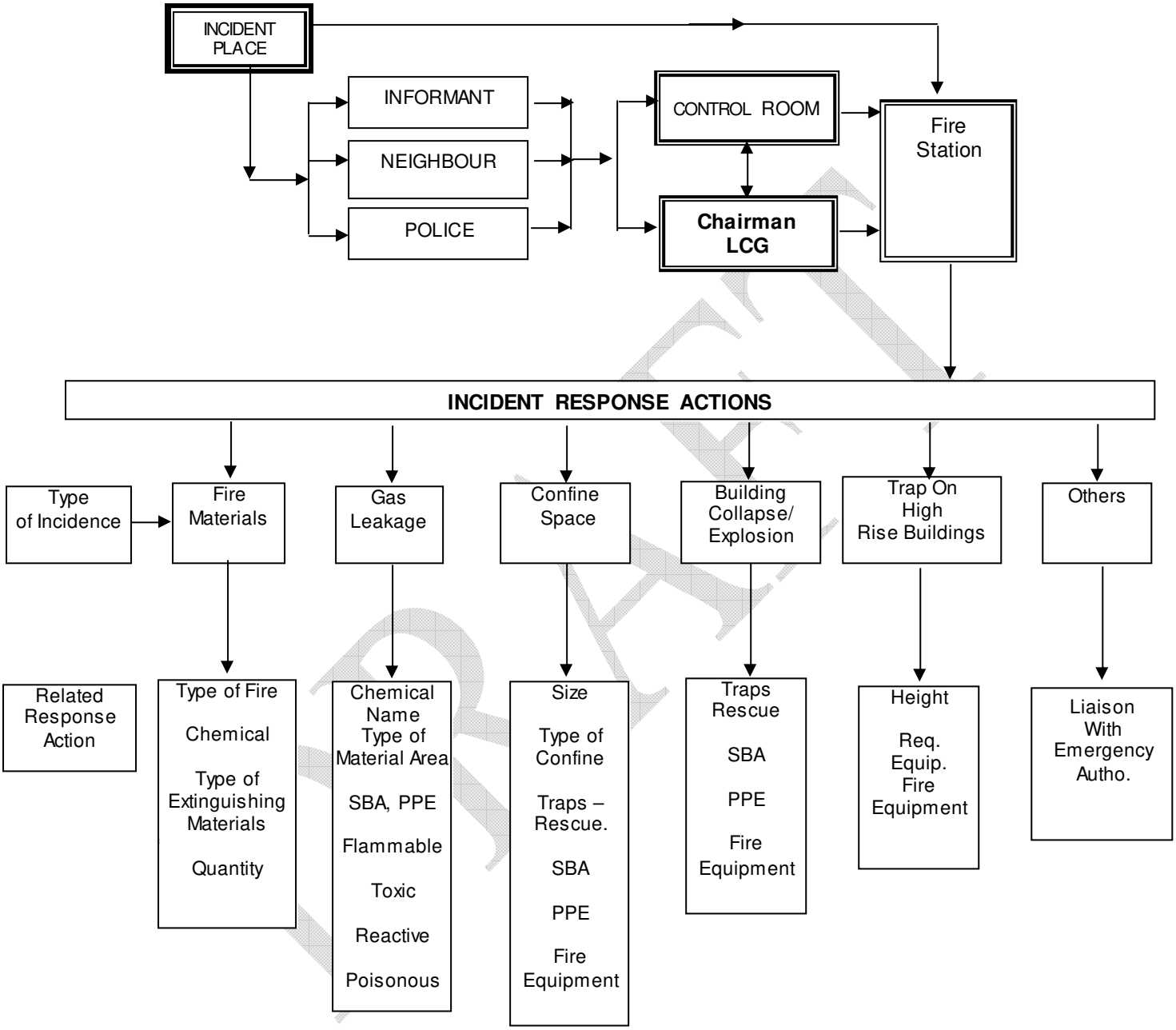


OFF-SITE EMERGENCY PLAN
BARDOLI & MAHUVA LOCAL CRISIS GROUP

ANNEXURE – 4-B

BARDOLI & MAHUVA LOCAL CRISIS GROUP

RESPONSE – FIRE SERVICES

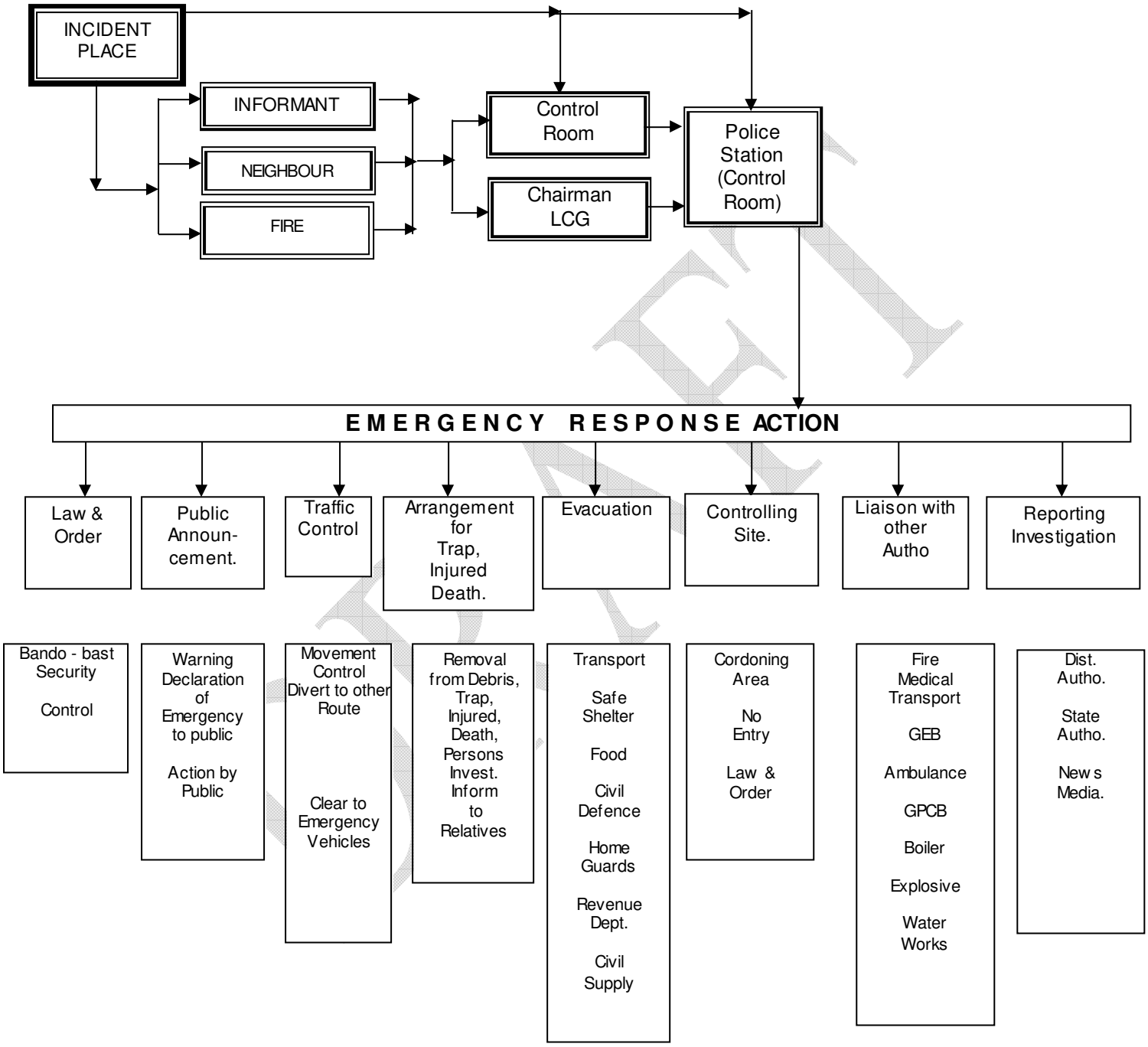


OFF-SITE EMERGENCY PLAN
BARDOLI & MAHUVA LOCAL CRISIS GROUP

ANNEXURE – 4-C

BARDOLI & MAHUVA LOCAL CRISIS GROUP

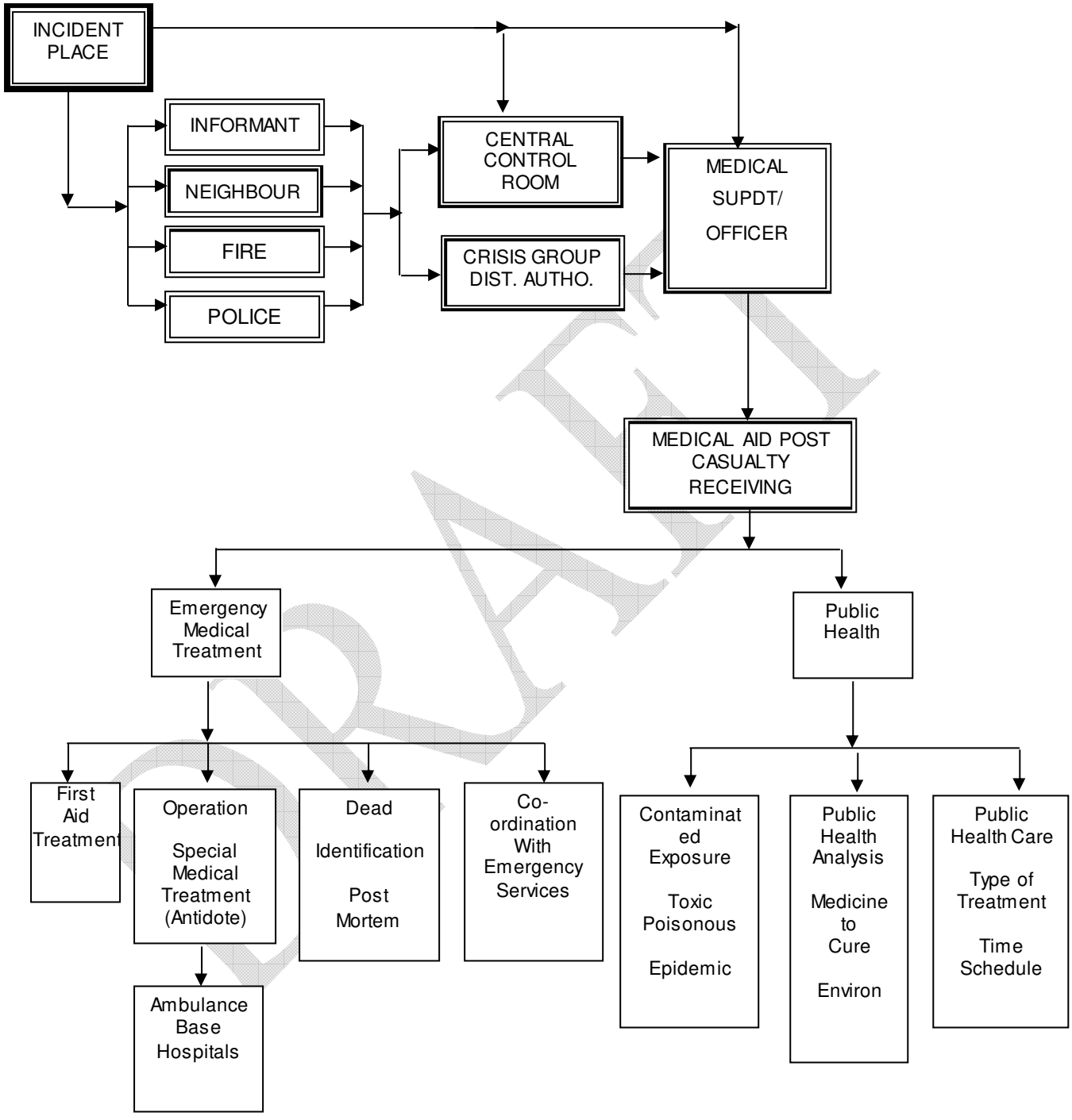
RESPONSE - POLICE DEPARTMENT



ANNEXURE – 4-D

BARDOLI & MAHUVA LOCAL CRISIS GROUP

RESPONSE- MEDICAL & HEALTH



OFF-SITE EMERGENCY PLAN
BARDOLI & MAHUVA LOCAL CRISIS GROUP

ANNEXURE – 5

BARDOLI & MAHUVA LOCAL CRISIS GROUP

LIST OF FIRE STATIONS

Sr. No.	Name of Department / Agency	STD Code	Contact Telephone Number
1	2	3	4
FIRE BRIGADE /DEPARTMENT			
1.	Fire Control Room (Main)	0261	0261- 2414139 / 2414195 / 2414196. 101 / 102 EXT. 324 (M.97243 46022)
2.	Chief Fire Officer, SMC, Surat	0261	2422285, (M) 97243 45508
3.	Fire & Accident	0261	101
4.	Ambulance (SMC)	0261	102
5.	Fire Station, Muglisara (Head Qurters)	0261	2400172, 2423750/413
6.	Fire Station, Mandarvaja	0261	2331357
7.	Fire Station, Majura	0261	2230686
8.	Fire Station, Adajan	0261	2781232
9.	Fire Station, Mora Bhagal (Rander)	0261	2770768
10.	Fire Station, Kosad	0261	2497240
11.	Fire Station, Katargam	0261	2482269
12.	Fire Station, Varachha (Kapodra)	0261	2571388
13.	Fire Station, Navsari Bazar	0261	2400246
14.	Fire Station, Ghanchi Sheri	0261	2400173
15.	Fire Station, Dumbhal (Limbayat)	0261	7433976341
16.	Fire Station, Bhestan	0261	6359773860
17.	Fire Station, Mota Varachha	0261	2494244
18.	Fire Station, ERC Kamrej	0261	9408088095
19.	Fire Station, Dindoli	0261	6359773859
20.	Fire Station, Palanpur	0261	6359908101
21.	Fire Station, Vesu	0261	6359773851

ANNEXURE – 6

BARDOLI & MAHUVA LOCAL CRISIS GROUP

LIST OF MAJOR HOSPITALS

Sr. No.	Name of Department / Agency	STD Code	Contact Telephone Number
1	2	3	4
MEDICAL & HEALTH			
1.	Medical Superintendent, New Civil Hospital, Surat	0261	2244985, 2244456-59
2.	District Health Officer, District Panchayat, Surat	0261	2430589
3.	Old Civil Hospital, Surat	0261	2479311, 2479610
4.	New Civil Hospital, Surat	0261	2244456 to 59
5.	Mahavir Hospital, Surat	0261	2332829 to 32
6.	Surat General Hospital, Surat	0261	2479791
7.	Maskati Hospital, Surat	0261	2420412, 9724346065 -66
8.	ESIC General Hospital, Majura Gate, Surat	0261	2244110
9.	CHC & Referral Hospital, Olpad, Surat	02621	222048
10.	CHC & Referral Hospital, Kamrej, Surat	02621	252319
11.	Dr. Shing, Palsana, CHC, Palsana	02622	264232
12.	Lokhat M.R.I. Centre, Sumul Dairy Road	0261	2422080-81
13.	Mahavir City Scene Centre	0261	2470114, 6569119
14.	Walk Heart Hospital	0261	2656590-91
15.	Pramukhswai Hospital (BAPS)	0261	2781000
16.	Sanjivini Hospital, Chalthan, Surat	02622	281083, 281368, 281253
17.	Surat Municiple Institute of Medical Eduction & Research (SMIMER)	0261	2368040-44
18.	Surat Raktdan Kendra	0261	2630114, 6353503022
19.	Surat Heathcare Foundation Blood Bank	0261	2400094, 9712990094
20.	Lok Samrpan Raktdan Kendra	0261	2552020, 2547575 (24 hrs), 2541414
21.	Lokhat Hospital	0261	2422080-81, 2400058
22.	Lokdrashti Eye Bank		9825034591, 9824146208
23.	Maskati Dharmarth Hospital	0261	2368040-44, 9724346065-66, 9727740944

ANNEXURE – 7

BARDOLI & MAHUVA LOCAL CRISIS GROUP

LIST OF POLICE STATIONS

Sr. No.	Name of Department / Agency	STD Code	Contact Telephone Number
1	2	3	4
POLICE DEPARTMENT			
1.	Commissioner of Police	0261	2463939-40 (2667322 2668373, M. 99784 06271)
2.	Additional Police Commissioner (ADMIN)	0261	2463636
3.	Deputy Police Commissioner North	0261	2463637
4.	Deputy Police Commissioner West & Traffic	0261	2463839
5.	Police Inspector chowk bazar	0261	2424185
6.	Police Inspector Wireless	0261	2669574
7.	Police Inspector control	0261	2462600
8.	Police Inspector D.C.B	0261	2415572
9.	Police Inspector kapodra	0261	2574965
10.	Police Inspector katargam	0261	2483215
11.	Police Inspector Limbayat	0261	2282328
12.	Police Inspector Mahidharpura	0261	2415571
13.	Police Inspector RANDER	0261	2766846
14.	Police Inspector P.C.B	0261	2472629
15.	Police Inspector ATHWALINES	0261	2460959
16.	Police Inspector SALABATPURA	0261	2324229
17.	Police Inspector S.B	0261	2463800
18.	Police Inspector UDHANA	0261	2280329
19.	Police Inspector UMRA	0261	2666295
20.	Police Inspector SACHIN	0261	2463900
21.	Police Inspector ICCHHAPORE	0261	2860197
22.	Police Inspector VARACHA	0261	2554486
23.	POLICE INSPECTOR, BARDOLI	02622	(O) 02622-220168 (M) 99789 21234
24.	POLICE SUB INSPECTOR. BARDOLI	02622	(O) 02622-220168 (M) 83203 94145
25.	POLICE SUB INSPECTOR, MAHUVA	02625	(O) 02625-255733 (M) 90999 27736

ANNEXURE – 8

BARDOLI & MAHUVA LOCAL CRISIS GROUP

LIST OF SAFE SHELTER

Sr. No.	Evacuation Area Location	Capacity (No. Of People)	Contact Authority Name With Address (O, R) And Phone- Numbers (O, R, M)
1	2	3	4
1.	B. A. B. S. Highschool, Bardoli	1000	(02622) 220074
2.	Government Primary School, Bardoli	500	Bardoli

ANNEXURE – 9

BARDOLI & MAHUVA LOCAL CRISIS GROUP

METEOROLOGICAL DETAILS

Sr. No.	Period of Year		Max. Temp °C (Avg.)	Min. Temp °C (Avg.)	Wind Velocity	Wind Direction	Weather Conditions
	From	To					
1	1st January	15th January	28	12	4.2	NE/N	Cold
2	16th January	31st January			5.1	NW/W	Cold
3	1st February	15th February	30.0	14.0	3.7	NE/N	Calm (25%)
4	16th February	31st February			4.7	NW/SW	Cold
5	1st March	15th March	36.0	19.0	4.2	NE/SE	Calm (23%)
6	16th March	31st March			5.1	NW/SW	Dry
7	1st April	15th April	39.0	23.0	4.2	S/SW	Calm (18%)
8	16th April	31st April			5.1	SW/NW	Hot
9	1st May	15th May	41.0	26.0	4.75	SW/S	Dry/Hot
10	16th May	31st May			4.75	SW/S	Dry/Hot
11	1st June	15th June	38.0	27.0	4.7	SW/S	Moist
12	16th June	31st June			4.2	SW/S	Moist
13	1st July	15th July	33.0	26.0	4.75	SW/S	Rainy
14	16th July	31st July			4.57	SW/S	Rainy
15	1st August	15th August	32.0	24.0	4.93	SW/W	Moist
16	16th August	31st August			4.75	SW/S	Moist
17	1st September	15th September	34.0	24.0	4.1	SW/W	Calm (21%)
18	16th September	31st September			4.75	SW/W	Cool
19	1st October	15th October	36.0	21.0	4.4	NE/E	Calm (21%)
20	16th October	31st October			5.1	SW/NW/NE	Cool
21	1st November	15th November	33.0	16.0	4.57	E/NE	Cool
22	16th November	31st November			4.75	NE/NW	Cool
23	1st December	15th December	29.0	13.0	4.57	NE/E	Cold
24	16th December	31st December			4.93	NW/NE	Cold

ANNEXURE – 10

BARDOLI & MAHUVA LOCAL CRISIS GROUP

SALIENT PROPERTIES OF SOME HAZARDOUS CHEMICALS

Sr. no.	Name of Chemicals	State	Colour	Odour	Sp. Gravity	Vapour Density	Melting Point ^0C	Boiling Point ^0C	Flash Point ^0C	Explosive limit		TLV ppm	Solubility in Water	Hazchem	NFPA Code			Hazards
										LEL	UEL				H	F	R	
										%	%							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	16	18	19
1.	Ethyl Alcohol	Liquid	Colourless	Alcohol Odour	0.7893	1.59	-	78.32	17.77	3	19	1000	Soluble	2 S * E	0	3	0	Fire
2.	Sulphur	Liquid or Molton Solid	Yellow to redish brown	Faint rotten egg odour	1.8	8.9	113-119	444.6	168	-	-	-	Not Soluble	2	2	1	0	Flammable
3.	Sulphuric Acid (H2SO4)	Liquid	Colourless, Oily	Odourless	1.84	-	10.49	290	-	-	-	1 mg/m3	Miscible	2 P	3	0	2	Corrosive & Oxidiser

ANNEXURE - 11

BARDOLI & MAHUVA LOCAL CRISIS GROUP

COLOUR CODE SYSTEM FOR PIPE LINES

COLOUR CODE FOR GENERAL SERVICES (UTILITY)

Table – 2 [IS 2379 : 1990 (Clauses 7.5 and 9.1)]

Sr. No.	Contents	Ground Colour	First Colour Band	Second Colour Band
WATER :				
1.	Boiler Feed Water	Sea Green	Gulf Red	-
2.	Central Heating Below 60°C	Sea Green	Canary Yellow	-
3.	Central Heating 60°C To 100°C	Sea Green	Dark Violet	-
4.	Central Heating Above 100°C	Sea Green	Dark Violet	Signal Red
5.	Chilled Water	Sea Green	Black	Canary Yellow
6.	Condensate	Sea Green	Light Brown	-
7.	Cooling	Sea Green	French Brown	-
8.	Filtered Water	Sea Green	Light Brown	-
9.	Fire water	Fire Red	Crimson Red	-
10.	Hydraulic Power	Sea Green	Black	-
11.	Treated	Sea Green	Light Orange	-
12.	Waste Water	Sea Green	Canary Yellow	Signal Red
AIR :				
13.	Compressed Up to and including 15 kg/cm²	Sky Blue	-	-
14.	Compressed to over 15 kg/cm²	Sky Blue	Signal Red	-
15.	Dry Vacuum	White	-	-
16.	High Pressure Steam	Aluminium to IS 2339	French Blue	-
17.	Medium Pressure Steam	Aluminium To IS 2339	Gulf Red	-
18.	Low Pressure Steam	Aluminium To IS 2339	Canary Yellow	-
19.	Instrument Air	Sky Blue	French Blue	-
20.	Drainage	Black	-	-
OILS :				
1.	Furnace Oil	Light Brown	French Blue	-
2.	High Speed Diesel Fuel	Light Brown	-	-
3.	Hydraulic Power	Light Brown	Dark Violet	-
4.	Light Diesel Fuel	Light Brown	Brilliant Green	-
5.	Lubricating Oil	Light Brown	Light Grey	-

INDUSTRIAL GASES (For Pipelines)

Sr. No.	Contents	Ground Colour	First Colour Band	Second Colour Band
1.	Acetylene	Canary Yellow	Service Brown	-
2.	Ammonia	Canary Yellow	Dark Violet	-
3.	Butane	Canary Yellow	Signal Red	-
4.	Chlorine	Canary Yellow	Dark Violet	Light Orange
5.	Ethylene Oxide	Canary Yellow	Dark Violet	Brilliant Green
6.	Hydrogen	Canary Yellow	Signal Red	French Blue
7.	Hydrogen Sulphide	Canary Yellow	Gulf Red	-
8.	Methane	Canary Yellow	Signal Red	Light Brown
9.	Methyl bromide	Canary Yellow	Fresh Blue	Black
10.	Nitrogen	Canary Yellow	Black	-
11.	Oxygen	Canary Yellow	White	-
12.	Phenol	Canary Yellow	Dark Violet	Smoke Grey
13.	Phosgene	Canary Yellow	Black	White
14.	Propane	Canary Yellow	Signal Red	Black
15.	Sulphur Dioxide	Canary Yellow	Dark Violet	Golden Brown

HYDROCARBON AND NAPHTHA (PETROLEUM PRODUCTS

Sr. No.	Contents	Ground Colour	First Colour Band	Second Colour Band
1.	Acetone	Dark Admiralty Grey	Black	Canary Yellow
2.	Benzene	Dark Admiralty Grey	Canary Yellow	-
3.	Butadiene	Dark Admiralty Grey	Black	-
4.	Ethylene Di-Chloride	Dark Admiralty Grey	Gulf Red	-
5.	Methanol	Dark Admiralty Grey	Deep Bull	-
6.	Naphtha	Dark Admiralty Grey	Light Brown	Black
	ACIDS :			
1.	Hydrochloric Acid	Dark Violet	Silver Grey	-
2.	Hydrofluoric Acid	Dark Violet	Signal Red	French Blue
3.	Nitric Acid	Dark Violet	French Blue	Light Orange
4.	Phosphoric Acid	Dark Violet	Silver Grey	-
5.	Sulphuric Acid	Dark Violet	Brilliant Green	Light Orange
	CHEMICAL & ALLIED PRODUCTS			
1.	Brine	Black	White	-
2.	Carbon Disulphide	Black	Light Orange	-
3.	Caustic Solution	Smoke Grey	Light Orange	-
4.	Lime	Smoke Grey	White	Canary Yellow

ANNEXURE - 12

BARDOLI & MAHUVA LOCAL CRISIS GROUP

HOW TO EXTINGUISH A FIRE AT THE INITIAL STAGE

The best way to stop any full fire is to smother, or extinguish it in its initial stages. But what you do depends on what type of fire it is.

1. General Rule :

If a fire has taken hold, (spread to other areas or structures or the smoke has it at head height), all occupants of that building must be evacuated. Note to all: Do not fight a fire not worth fighting; evacuate the building, personal safety comes first.

Aim the extinguisher nozzle at the base or seal of a fire for most effective extinguishing of fire.

2. Electrical Fires :

The first thing you must do to stop or extinguish electrical fault or short circuit fire is to:

2.1 Turn off all power supply to the equipment/ machine on fire, usually done by turning off the main power supply. This step alone is usually enough to stop most fires in the incipient stage.

2.2 Do not use water on live electrical equipment fire. It may cause electric shock.

2.3 The safest and the best way to extinguish electrical fire is to use a CO^2 / clean agent/DCP fire extinguisher. Follow the instructions on it for more information. Note: During the initial stages of fire, once the fire is put out the surfaces that it has touched or burned are very hot and are likely to catch fire. You must have enough extinguishing material for at least 7 extinguishing attempts. e.g. (Remember: If you do not turn off the mains power supply, electric shock is likely to occur.)

ANNEXURE – 12
Continue…

BARDOLI & MAHUVA LOCAL CRISIS GROUP
HOW TO EXTINGUISH A FIRE AT THE INITIAL STAGE

3. LIQUID FIRES :

The first thing you must do to stop a liquid fire (e.g. gasoline, Petrol) is to:

3.1 Never throw water on a liquid Fire :

This is due to water and oils properties. If the water is thrown on the fire, the following will occur.

3.1.1 Water does not mix with the oil, and thus goes underneath it (oil and water don't mix, when they are together oil is on top water on bottom). It will then boil and become steam very quickly this quick boil is dangerous. Since the water is on the bottom of the oil as it evaporates it sprays hot, burning oil in every direction. This then spreads the fire and usually leaves you unconscious.

3.2 To stop a liquid fire you must

3.2.1 Use a safety blanket and smother the fire, this is particularly useful at home. Use this only if the fire is small enough to cover.

3.2.2 Foam type fire extinguisher is most suitable for fire on liquids. Remember to read the instructions very carefully. If the extinguisher instructs you to not use it on a liquid or chemical fire, do not use it. Call the fire brigade and evacuate the building.

3.3 Combustible Material Fires: This type of fire involved solid combustible materials like – Wood, Paper, cloth etc. To extinguish the fire in early stage, the following must be considered:-

3.3.1 Use lots of water to quench the fire. This is the best and quickest solution at the early stage.

3.3.2 If you are trained and can handle, use fire extinguishers (Water Based, DCP- ABC type). Read the instruction on the fire extinguisher to use it properly on specified fire.

ANNEXURE - 13

BARDOLI & MAHUVA LOCAL CRISIS GROUP

DETAILS ON BURNS AND THEIR TREATMENT

1. CAUSES OF BURNS

Under the category of burns, several environmental injuries are included. They are: thermal burns, burns from electrical current, chemical burns, burns resulting from radiant energy and systemic reactions to heat.

2. SEVERITY OF THERMAL BURNS

The seriousness of the thermal burns depends upon the degree of the burn (depth of the skin Injured) and the amount of body surface involved.

a. Degree of Burns:

Burns can be classified in degrees from one through four. (a) First-degree burn is limited to the most superficial layer of the epidermis and results only in erythema (reddening) of the skin.

(b)Second-degree burn causes damage into but not through the dermis and characteristically results in the appearance of vesicles (blisters) in the skin.

(c) Third degree burn is one in which the full thickness of the skin is destroyed down to the subcutaneous fat. In this burn the skin may appear pale, dry and white; it may even be brown or charred. Clotted blood vessels may be seen through the skin as though one were looking at them through parchment.

(d) Fourth degree burns also damage the underlying bones, muscles, and tendons. There is no sensation in the area since the nerve endings are destroyed.

With bums more serious than second degree, there is destruction of the sensory nerve endings of the skin. The burned area is consequently insensitive. However, the area surrounding the burn will not have all nerve endings destroyed and may frequently be extremely painful.

ANNEXURE – 13

Continue…

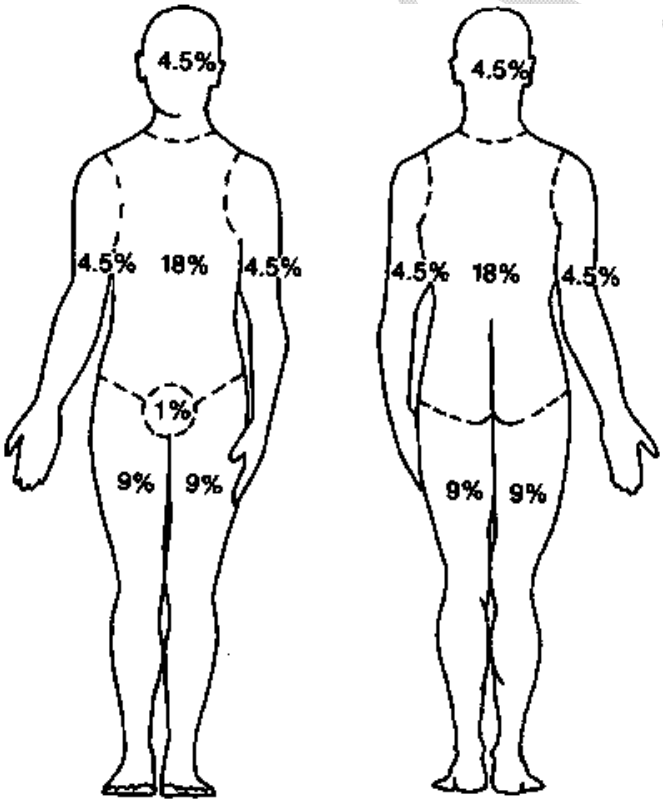
BARDOLI & MAHUVA LOCAL CRISIS GROUP

DETAILS ON BURNS AND THEIR TREATMENT

b. BODY SURFACE INVOLVED:

The amount of body surface that is burned is very important in determining the seriousness of the Injury. A very rough but reasonably accurate estimate of the amount of body surface burned is determined by the rule of nine. This rule, which applies specifically in adults and older children, divides the body into sections, each of which constitutes approximately 9 % of the total area. The body sections and the respective percentage assigned to them are:

Head, Face (area involving neck and above)	9%	
Each arm		9%
Front torso	18%	
Each leg		18%
Back	18%	
Genitals		1%



ANNEXURE – 13

Continue…

BARDOLI & MAHUVA LOCAL CRISIS GROUP

DETAILS ON BURNS AND THEIR TREATMENT

By knowing the degree of burn, the approximate percentage of the body that has been burn, accompanying complications, and the age of the patient, one can classify the severity of thermal burns as critical, moderate, or minor. Such classification is essential in a disaster where many injured patients may be involved and where the triage separates the patients into emergency cases and cases for whom treatment may be delayed. A summary of the three classes follows.

c. CRITICAL (SEVERE) BURNS:

This category includes:

- All burns of whatever degree and extent, if they are complicated by respiratory tract Injury and other major injuries or fractures
- Third degree burns Involving critical areas such as face hands or feet
- Third degree burns which Involve more than 10% of the body surface
- Second degree burns which Involve more than 30% of the body surface

d. MODERATE BURNS:

This category includes:

- Third degree burns of 2 to 10 percent of the body surface which do not involve the face, hands or feet
- Second degree burns which involve 15 to 30 percent of the body surface
- First degree burns Involving 50 to 75 percent of the body surface

ANNEXURE – 13

Continue…

BARDOLI & MAHUVA LOCAL CRISIS GROUP

DETAILS ON BURNS AND THEIR TREATMENT

e. MINOR BURNS:

This category includes:

- Third degree burns of less than 2 percent of the body surface if no critical areas are involved
- Second degree burns involving less than 15 percent of the body surface
- First degree burns of less than 20 percent of the body surface

In evaluating a patient who has sustained a burn, age and general condition must also be considered. A moderate burn in an aged patient who is chronically ill should be classified as critical in terms of the immediate treatment required because of the patient's general condition apart from the burns.

3. THE CARE OF THERMAL BURNS

The care of thermal burns depends on the percentage of burned body surface involved. In no instance should grease (butter, lard, Vaseline, mineral oil or other ointments) be applied to a burn. For the first or second-degree burns, the emergency medical treatment should be to:

- Remove any burning/ smouldering clothing as necessary
- Immerse the burned part in cool water for five to ten minutes to keep the temperature low. If area cannot be immersed, cover with clean, porous cloth of any kind and keep continuously wet with cool water.
- Make sure you don't use ice, as this may make the damage worse. Never apply cotton balls to a burn because the small fibers can stick to the injury and increase the risk of infection. Also, avoid home remedies like butter and eggs as these are not proven to be effective.

ANNEXURE – 13

BARDOLI & MAHUVA LOCAL CRISIS GROUP

DETAILS ON BURNS AND THEIR TREATMENT

- Use cool wet applications for relief of pain.
- Transport the patient to the emergency department, continuing cool applications en- route.

For extensive first or second degree burns and for all third degree burns the procedure set forth below should be followed.

- Examine for and relieve any respiratory distress. Always anticipate respiratory difficulty when there are burns around the face and neck or when the patient has been exposed to hot gases or smoke.
- Clothing that adheres to the skin should be cut around and left in place.
- Cover the burned area with a sterile dressing or a clean sheet. Use cool wet applications for pain relief.
- Treat the patient for shock if it is apparent.
- Transport the patient to the emergency department, continuing cool applications en- route.

Severe pain, which may accompany first or second degree burns or may exist at the edges of third degree bums, is best relieved by injected analgesic medication. These drugs must be given by a qualified person or on doctor's order.

Local treatment with cool compress remains the best emergency treatment for burn pain. Third degree bums, which destroy nerve endings, are often not painful enough to require such treatment before the patient reaches the hospital. In burns of this degree and increasing severity, initial efforts are best directed at general support and resuscitation of the patient.

ANNEXURE – 14

BARDOLI & MAHUVA LOCAL CRISIS GROUP

FORMAT FOR EMERGENCY COMMUNICATION

1	Date & Time of receiving information/massage	:
2	Date & Time of incident/accident	
3	Place of Incident	:
4	Type of Incident	:
5	Involved Probable Chemicals with probable Quantity	:
6	Involved Probable Persons (injured, Death, etc)	:
7	Type of Help/resources	:
8	Other Details	:
9	Name of Person,& Designation receiving Info.	:
10	Other Details	:

Sr. No	Dealing Person		Action		Communication			Reporting Date& Time
	Primary Requirement	Alternate Requirement	Act	Help/Resource	Whom	How	What	
1	2	3	4	5	6	7	8	9
1								
2								
3								
4								
5								
6								
7								
8								

ANNEXURE – 15

BARDOLI & MAHUVA LOCAL CRISIS GROUP

REGISTER FOR CHEMICAL ACCIDENT OCCURRED IN THE INDUSTRIAL POCKET

Sr. No.	Place of Chemical Accident	Type of Chemical Accident (like fire, Explosion, Gas Dispersion etc.)	Date & Time of Accident	Chemical Involved	Duration	Accident Effect					Reported/ non Reported	Informant with date	Remarks
						Nos. of Affected Person	Nos. of Injured Person	Nos. of Death	Properties Damage	Environmental Damage			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.													
2.													
3.													
4.													
5.													
6.													
7.													
8.													
9.													
10.													

ANNEXURE – 16

BARDOLI & MAHUVA LOCAL CRISIS GROUP

FORMAT FOR REGISTER FOR PUBLIC INQUIRY

Sr. No.	Date of Complaint & Time	Name of Person (Complainant)	Address	Complaint Details	Date of Investigation	Result	Remark	Replied on	Remarks
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									

ANNEXURE – 17

BARDOLI & MAHUVA LOCAL CRISIS GROUP

FORMAT FOR EXERCISE / MOCK DRILL / REHEARSAL

1	AIM / PURPOSE	:	
2	AUTHORIZED BY	:	
3	PARTICIPANTS	:	1. ☐ Original Industry 2. ☐ Surrounding Factories 3. ☐ Mutual Aiders 4. ☐ Emergency Services 5. ☐ Government Departments 6. ☐ Experts / Observers / Umpires / Invitees 7. ☐ Surrounding Public 8. ☐ N. G. O. / Volunteer Organizations 9. ☐ Other Essential Persons / Teams
4	CODE NAME	:	
5	NATURE	:	1. ☐ Origin 2. ☐ Date & Time of Commencement 3. ☐ Locations / Site.
6	DATE, TIME AND DURATION OF EXERCISE	:	
7	CO-ORDINATION COMMITTEE (APEX CRISIS GROUP)	:	1. ☐ Chair Person – Collector & D. M. 2. ☐ Member Secretary – Factory Inspector 3. ☐ Member Fire Fighting Commandant 4. ☐ Member Police Commandant 5. ☐ Member Medical & Health Commandment 6. ☐ Member Expert Panel 7. ☐ Member Representation from Industries 8. ☐ Member I/C Off site Control Room
8	WORKING COMMITTEE	:	1. ☐ Chair Person District Development Officer (District Panchayat) 2. ☐ Member : Fire Brigade Services 3. ☐ Member : Police Force, Civil Defence + Home Guard 4. ☐ Member : Medical Services, Health Department, Hospitals, Private Doctors 5. ☐ Member : Incident Controllers from MAH Units Safety Officers 6. ☐ Member : Safe Shelters – Activities, Govt. Officials, N.G.O., Volunteer Organisations, Public Relations 7. ☐ Members : Transport Activities : RTO, S. T. Services, Emergency Equipment Suppliers, Private Transporters, Telephone Departments, GIDC Authorities

ANNEXURE – 17

Contd...

BARDOLI & MAHUVA LOCAL CRISIS GROUP

FORMAT FOR EXERCISE / MOCK DRILL / REHEARSAL

8	WORKING COMMITTEE		8. ☐ Members : Monitoring Services: GPCB Authorities, Explosive Authorities, Boiler Inspectorate, Technical Persons 9. ☐ Members : Observers / Reporters
9.	AFFECTED ZONES	:	1. ☐ Critical Zone (Max. Damage Area) 2. ☐ Semi-Critical Zone (Moderately Affected Area) 3. ☐ Alert Zone (Warn Area)
10.	CONTROL ROOM	:	1. ☐ Off Site Control Room 2. ☐ Shadow Control Room 3. ☐ Emergency Control Centre
11.	SEQUENTIAL ACTIONS	:	1. ☐ Meeting of Apex Crisis Group 2. ☐ Meeting of Working Group / Industries 3. ☐ Public Education 4. ☐ Table – Exercise 5. ☐ Preparation Stage 6. ☐ Actual Exercise / Stimulation 7. ☐ De-brief Meeting 8. ☐ Conclusion Report
12.	FACILITIES	:	1. ☐ Communication System and Arrangements. 2. ☐ Transport Arrangement / Vehicles. 3. ☐ Identification Badges / Passes / Uniforms. 4. ☐ Mass-Education Arrangements. 5. ☐ Selection of Event / Place & Training 6. ☐ Training / Preparedness to all participants 7. ☐ Maps / Charts / Stationary / Banners 8. ☐ Arrangement of Various Meetings 9. ☐ Photographs / Video 10. ☐ Arrangement for Tea, Refreshment, Lunch etc. 11. ☐ Manpower / Vehicles / Telephones / Equipments 12. ☐ Off-Site Emergency Action Plan / On-Site Emergency Action Plan / Technical Details / M.S.D.S., etc.
			13. ☐ Pen, Pencils, Papers, Folders, Files, Pins, etc. Stationeries.
			14. ☐ Tables, Chairs etc. furniture
13.	REPORT	:	BRIEF REPORT, NOS OF PARTICIPATENTS, INVOLVEMENT, RECOMMENDATIONS, ETC.

ANNEXURE – 18

BARDOLI & MAHUVA LOCAL CRISIS GROUP

ABSTRACT:CHEMICAL ACCIDENTS (EPPR) RULES-1996(2000)

THE GAZETTE OF INDIA EXTRA ORDINARY PART – II SECTION – 3(1)

Ministry of Environment & Forests Notification

New Delhi, the 01st August, 1996

Rules on Emergency planning, Preparedness and Response for Chemical Accidents

G.S.R. 347 (E). – In exercise of the powers conferred by Sections 6,8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules, namely :-

1. Short Title and Commencement.--
   a. These rules may be called the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.

   b. They shall come into force on the date of their publication in the Official Gazette.

2. **Definitions** :- In these rules unless the context otherwise requires, -

   a. "Chemical accident" means an accident involving a fortuitous or sudden or unintended occurrence while handling any hazardous chemicals resulting in continuous, intermittent or repeated exposure to death, or injury to, any person or damage to any property but does not include an accident by reason only of war or radio-activity.

   b. "Hazardous chemical" means, -
      1. any chemical which satisfies any of the criteria laid down in Part 1 of Schedule 1 or is listed in Part 2 of the said schedule;
      2. any chemical listed in Column 2 or Schedule 2;
      3. any chemical listed in Column 2 of Schedule 3.

   c. "Industrial activity" includes an operation or process,-
      1. carried out in an industrial installation referred to in Schedule – 4 involving or likely to involve one or more hazardous chemicals;
      2. On-site storage or on-site transport, which is associated with that operation or process as the case may be;
      3. Isolated storage;
      4. Pipeline.

   d. "Industrial pocket" means any industrial zone earmarked by the Industrial Development Corporation of the State Government of by the State Government.

   e. "Isolated storage" means – storage of a hazardous chemical other than storage associated with an installation on the same site specified in Schedule – 4 where that storage involves at least the quantities of that chemical set out in Schedule-2;

   f. "Major chemical accident" means, -- an occurrence including any particular major emission, fire or explosion involving one or more hazardous chemicals and resulting from uncontrolled developments in the course of industrial activity or transportation or due to natural events leading to serious effects both immediate of delays, inside or outside the installation likely to cause substantial loss of life and property including adverse effects on the environment;

   f. "Major Accident Hazards (MAH) Installations", -- means, isolated storage and industrial activity at a site, handling (including transport through carrier or pipeline) of hazardous chemicals equal to or, in excess of the threshold quantities specified in column 3 of Schedules 2 and 3 respectively;

   h. "Manufacture, Storage and Import of Hazardous Chemicals Rules" means – the Manufacture, Storage and import of Hazardous Chemicals Rules, 1989, published in the notification of Government of India in the Ministry of Environment & Forests No. S.O.966 (E) dated 27th November, 1989.

   i. "Off-site emergency plan" means, - the off-site emergency plan prepared under rule 14 of the Manufacture, Storage and Import of Hazardous Chemicals Rules;

   j. "Pipeline" means, -- a pipe (together with any apparatus and works associated therewith) or system of pipes (together with any apparatus and works associated therewith) for the conveyance of a hazardous chemical other than a flammable gas as set out in column 2 of Part II of Schedule 1, at a pressure of less than 8 bars absolute;

   k. "Site" means, -- any location where hazardous chemicals are manufactured or processed, stored, handled, used, disposed of and includes the whole of an area under the control of an occupier and includes pier, jetty or similar structure whether floating or not;

   i. "Transport" means, -- movement of hazardous chemicals by any means over land, water of air.

ANNEXURE – 18

Continue...

3. Constitution of Central Crisis Group:

a. The Central Government shall constitute a Central Crisis Group for management of Chemical accidents and set up a Crisis Alert system in accordance with the provisions of Rule-4 within thirty days from the date of commencement of these rules.

b. The composition of the Central Crisis Group shall be as specified in Schedule-5.

c. The Central Crisis Group shall meet at least once in six months and follow such procedure of transaction of business as it deems fit.

d. Notwithstanding anything contained in sub-rule (2) the Central Crisis Group may co-opt any person whose assistance or advice is considered useful in performing any of its functions to participate in the deliberations of any of its meetings.

4. Constitution of Crisis Alert System, - the Central Government shall,

a. set up a functional control room at such place as it deems fit.
b. set up an information net working system with the state and district control rooms.
c. appoint adequate staff and experts to man the functional control room.
d. publish a list of Major Accident Hazardous installations;
e. publish a list of major chemical accidents in chronological order;
f. publish a list of members of the Central State and District Crisis Groups;
g. take measures to create awareness amongst the public with a view to preventing chemical accidents.

5. Functions of the Central Crisis Group, -

a. The Central Crisis Group shall be the apex body to deal with major chemical accidents and to provide expert guidance for handling major chemical accidents.

b. Without prejudice to the functions specified under sub-rule(1), the Central Crisis Group shall –

1. continuously monitor the post-accident situation arising out of a major chemical accident and suggest measures for prevention and to check recurrence of such accidents;

2. conduct post-accident analysis of such major chemical accidents and evaluate responses;

3. review district off-site emergency plans with a view to examine its adequacy in accordance with the manufacture, storage, and import of hazardous chemicals, rules and suggest measures to reduce risks in the Industrial pockets;

4. review the progress reports submitted by the State Crisis Groups;

5. respond to queries addressed to it by the State Crisis Groups and the District Crisis Groups;
6. publish a state-wise list of experts and officials who are concerned with the handling of chemical accidents;

7. render, in the event of a chemical accident in a State all functional and infrastructural help as may be necessary.

6. Constitution of State Crisis Group, --

a. The State Government shall constitute a State Crisis Group for management of chemical accidents within thirty days from the date of commencement of these rules.

b. The composition of the State Crisis Group shall be as specified in Schedule 6.

c. The State Crisis Group shall meet at least once in three months and follow such procedure for transaction of business as it deems fit.

d. Notwithstanding anything contained in sub-rule(2) the State Crisis Group may co-opt any person whose assistance or advice is considered useful in performing any of its functions, to participate in the deliberation of any of its meetings.

7. Functions of the State Crisis Group, --

a. The State Crisis Group shall be the apex body in the State to deal with major chemical accidents and to provide expert guidance for handling major chemical accidents.

b. Without prejudice to the functions specified under sub-rule(1), the State Crises Group shall, --

c. review all district off-site emergency plans in the State with a view to examine its adequacy in accordance with the manufacture, storage and import of Hazardous chemicals, Rules and forward a report to the Central Crisis Group once in three months.

d. assist the State Government in managing chemical accidents at a site.

e. assist the State Government in the planning, preparedness and mitigation of major chemical accidents at a site in the State;

f. continuously monitor the post accident situation arising out of a major chemical accident in the State and forward a report to the Central Crisis Group;

g. review the progress report submitted by the District Crisis Groups;

h. respond to queries addressed to it by the District Crisis Groups;

ANNEXURE – 18

Continue...

i. publish a list of experts and officials in the State who are concerned with the management of chemical accidents.

8. Constitution of the District and Local Crisis Group, --

a. The state Government shall cause to be constituted within thirty days from the date of commencement of these rules, --

1. District Crisis Group,
2. Local Crisis Group,

b. The composition of the District Crisis Group and the Local Crisis Groups shall be as specified in Schedules 7 & 8 respectively.

c. The District Crises Group shall meet every forty five days and send a report to the State Crisis Group.

d. The local Crisis Group shall meet every month and forward a copy of the proceedings to the District Crisis Group.

9. Functions of the District Crisis Group, --

a. The District Crisis Group shall be the apex body in the district to deal with major chemical accidents and to provide expert guidance for handling chemical accidents;
b. Without prejudice to the functions specified under rule (1) the District Crisis Group shall, --
c. assist in the preparation of the district off-site emergency plan.
d. review all the on-site emergency plans prepared by the occupier of Major Accident Hazards installation for the preparation of the district off-site emergency plan;
e. assist the district administration in the management of chemical accidents at a site lying within the district.
f. continuously monitor every chemical accident;
g. ensure continuous information flow from the district to the Center and State Crisis Group,
h. forward a report of the chemical accident within fifteen days to the state crisis group;
i. conduct at least one full scale mock-drill of a chemical accident at a site each year and forward a report of the strength and the weakness of the plan to the State Crisis Group.

10. Functions of the Local Crisis Group, --

The Local Crisis Group shall be the body in the industrial pocket to deal with chemical accidents and co-ordinate efforts in planning, preparedness and mitigation of a chemical accident;

a. Without prejudice to the functions specified under sub-rule (1) the Local Crisis Group shall, --

1. prepare local emergency plan for the industrial pocket.
2. ensure dovetailing of the local emergency plan with the district off-site emergency plan;
3. train personnel involved in chemical accident management;

4. educate the population likely to be affected in a chemical accident about the remedies and existing preparedness in the area;

5. conduct at least one full scale mock-drill of a chemical accident at a site every six months and forward a report to the District Crisis Group;

6. respond to all public inquiries on the subject

11. Powers of the Members of the Central, State and District Crisis Groups, --

The Members of the Central Crisis Group, State Crisis Groups and District Crisis Groups shall be deemed to be persons empowered by the Central Government in this behalf under sub-section (1) of section 10 of the Environment (Protection) Act, 1986.

12. Aid and assistance for the functioning of the District and Local Crisis Groups, --

a. The Major accident Hazard installations in the industrial pockets in the district shall aid, assist and facilitate functioning of the District Crisis Group,

b. The Major Accident Hazard installations in the industrial pockets shall also aid, assist and facilities the functioning of the Local Crisis Group.

13. Information in the public, --

a. The Central Crisis Group shall provide information on request regarding chemical accident prevention, preparedness and mitigation in the country.

b. The State Crisis Group shall provide information on request regarding chemical accident prevention, preparedness and mitigation to the public in the State.

c. The Local Crisis Group shall provide information regarding possible chemical accident at a site in the industrial pocket and related information to the public on request;

d. The Local Crisis Group shall assist the Major Accident Hazard installations in the industrial pocket in taking appropriate steps to inform persons likely to be affected by a chemical accident

ANNEXURE – 18

Continue...

Schedule – I

[See rule 3(b) & 2(j)]

Part – I

a. Toxic Chemicals : Chemicals having the following values of acute toxicity and which owing to their physical and chemical properties, are capable of producing major accident hazards :

Sr. no.	Degree of toxicity	Oral toxicity LD50(mg/kg)	Dermal toxicity (Dermal LD50) (mg/kg)	Inhalation toxicity by dust & mists (mg/l)
1.	Extremely toxic	<5	<40	<0.5
2.	Highly toxic	>5 – 50	>4 – 200	>0.5 – 2.0
3.	Toxic	>50 – 200	>200 - 1000	>2 – 10

b. Flammable Chemicals :-

1. Flammable gases chemicals which in the gaseous state at normal pressure and mixed with air become flammable and the boiling point of which at normal pressure is 20°C or below.
2. Highly flammable liquids chemicals which have a flash point lower than 23°C and the boiling point of which at normal pressure is above 20°C.
3. Flammable liquids chemicals which have a flash point lower than 65°C and which remain liquids under pressure, where particular processing conditions, such as high pressure and high temperature, may create major accident hazards.

c. Explosion Chemicals which may explode under the effect of flame, heat or petro-chemical conditions or which are more sensitive to shocks or friction than dinitro-benzene.

Part – II

List of Hazardous and Toxic Chemicals

Sr.no	Name of the Chemical
1	Acetaldehyde
2	Acetic Acid
4	Acetone
12	Acrylonitrile
31	Ammonia
37	Aniline
56	Benzene
84	Bromine
88	Butadiene
109	Carbon Tetrachloride
110	Carbon Di-sulphide
119	Chloride
161	Cyclohexane
248	Ethyl Alcohol
261	Ethylene
285	Formaldehyde
306	Hexane
314	Hydrogen
315	Hydrogen Bromide
323	Iodine
334	Isopropyl Alcohol
347	Liquified Petroleum Gas.
368	Methane
377	Methyl Alcohol
423	Nitric Acid
425	Nitro Benzene
429	Nitrogen
444	Oleum
428	Oxygen
462	Parafin
481	Phenol
583	Styrene
591	Sulphuric Acid
628	Toluene
666	Turpentine
684	Zirconium & Compounds

* As per MSIHC Rules - 2000

Schedule – II & III

List of Chemicals with Threshold Quantity under rule 2(b), 2(c), 2(g).

Schedule – IV

List of Installation includes an operation or processes under rule 2(c), 2(e).

Schedule – V

[See rule 3(2)]

Composition of Central Crisis Group

1.	Secretary Govt. of India Ministry of Environment & Forests	Chair Person
2.	Joint Secretary Adviser (Environment & Forests)	Member Secretary
3.	Joint Secretary (Labour)	Member
4.	Joint Secretary / Advisor (Chemicals & Petrochemicals)	Member
5.	Director General, Civil Defence	Member
6.	Fire Advisor, Directorate General, Civil Defence	Member
7.	Chief Controller of Explosives	Member
8.	Joint Secretary (Dept. of Industries)	Member
9.	Direct General, Indian Council of Medical Research	Member
10.	Joint Secretary (Health)	Member
11.	Chairman, Central Pollution Control Board	Member
12.	Director General, Indian Council of Agriculture Research	Member
13.	Director General, Council of Scientific & Industrial Research	Member
14.	4 Experts (Industrial Safety and Health)	Member
15.	Joint Secretary (Fertilizers)	Member
16.	Director General (Telecom)	Member
17.	2 Representatives of Industries to be nominated by the Central Govt.	Member

18.	Joint Secretary (surface transport0	Member
19.	General Manager (Rail Safety)	Member
20.	Advisor, Centre for environment and explosive safety	Member
21.	One Representative of Indian Chemical Manufacturers Association to be nominated by the Central Govt.	Member

Schedule – VI

[See rule 6(2)]

Composition of the State Crisis Group

1.	Chief Secretary	Chair Person
2.	Secretary (Labour)	Member Secretary
3.	Secretary (Environment)	Member
4.	Secretary (Health)	Member
5.	Secretary (Industries)	Member
6.	Secretary (Public Health Engg.)	Member
7.	Chairman, State Pollution Control Board	Member
8.	4 Experts (Industrial Safety & Health) to be nominated by the State Govt.	Member
9.	Secretary / Commissioner (Transport)	Member
10.	Director (Industrial Safety / Chief Inspector of Factories)	Member
11.	Fire Chief	Member
12.	Commissioner of Police	Member
13.	One Representative from the industry to be nominated by the State Govt.	Member

Schedule – VII

[See rule 8]

Composition of the District Crisis Group

1.	District Collector	Chair person
2.	Inspector of Factories	Member secretary
3.	District Energy Officer	Member
4.	Chief Fire Officer	Member
5.	District information Officer	Member
6.	Controller of Explosives	Member
7.	Chief Civil Defence	Member
8.	One Rep. Of Trade Unions to be nominated by the Dist. Collector	Member
9.	Deputy Sup. Of Police	Member
10.	District Health Officer / Chief Medical Officer	Member
11.	Commissioner, Municipal Corporation	Member
12.	Rep. Of the Dept. of Public Health Engg.	Member
13.	Rep. Of Pollution Control Board	Member

ANNEXURE – 18

Continue...

14.	District Agricultural Officer	Member
15.	4 Experts (Industrial Safety & Health) to be nominated by the Dist. Collector	Member
16.	Commissioner (Transport)	Member
17.	One rep. Of Industry to be nominated by the Dist. Collector	Member
18.	Chair persons member secretary of Local Crisis Group	Member

Schedule – VIII

[See rule 8]

Composition of the Local Crisis Group

1.	Sub-divisional Magistrate / District Emergency Authority	Chair person
2.	Inspector of Factories	Member Secretary
3.	Industries in the District Industrial area / Industrial Pocket	Member
4.	Transporters of Hazardous Chemicals (2 nos.)	Member
5.	Fire Officer	Member
6.	Station House Officer (Police)	Member
7.	Block Development Officer	Member
8.	One rep. Of Civil Defence	Member
9.	Primary Health Officer	Member
10.	Editor of Local News Paper	Member
11.	Community leader / sarpanch / village pradhan nominated by Chair Person	Member
12.	One rep. Of non-government organization to be nominated by the Chair person	Member
13.	Two Doctors eminent in the Local area to be nominated by Chair person	Member
14.	Two social workers to be nominated by the chair person	Member

ANNEXURE – 19

BARDOLI & MAHUVA LOCAL CRISIS GROUP

GLOSSARY OF TERMS AND DEFINITIONS

1. **ACCIDENT**
An accident may be defined as "an undesirable and unplanned event with or without or major or minor damage consequence to life and/or property."

2. **ACGIH**
American conference of governmental Industrial Hygienists

3. **ACUTE**
SEVERE but of the short duration. ACUTE health effects are those that occur immediately after exposure to hazardous chemical.

4. **AEROSOL**
Particles (Solid or Liquid) that remains suspended in air for a period of time. (Mists, Smokes, Fumes, Dusts etc.)

5. **AIRBORNE RELEASE**
Release off any chemical into the air.

6. **AMBIENT**
ambient temperature is temperature of the surrounding area.

7. **AMORPHOUS**
Non-crystalline, having no definite form or shape.

8. **AN INCIDENT**
An incident is emergent situation of any critical deviation in the process control or otherwise that may lead to a major accident / potential emergency and disaster.

9. **ANEMOMETER**
A device used to measure speed of wind or any other moving gas.

10. **ANSI**
American National Standards Institute

11. **ATMOSPHERIC STABILITY**
Atmospheric Stability is defined in terms of vertical temperature gradient in the atmosphere. It is usually described using the system of categories developed by Pasquill. The categories of stability class are identified by the letter A to F (or sometimes A-G)

Neutral stability occurs typically, when there is total cloud cover and is designed by category D (The temperature gradient = adiabatic lapse rate) Unstable conditions occur when the sun is shinning. The unstable conditions are designated by the letters A-C with A is the least stable condition stable conditions occur on clear, calm nights, when the air near the ground is stratified and free from turbulence and are designated by the letter E & f. Some times an additional category G is used for exceptionally stable conditions. Neutral conditions correspond to a rate of decrease in temperature with height of about 1 Deg C per meters, vertically. For the dispersion study D & C stability class has been considered.

12. **BLEVE (BOILING LIQUID EXPANDING VAPOUR CLOUD EXPLOSION)**
The event may have two folds, one; flammable liquid under pressure rapidly spread in to the open area in form of vapour cloud, two; if this spreading vapour cloud gets any source of ignition, then violently explosion took place produce missiles effect with secondary fires and create heavy damages to the surrounding area. The phenomena is called as BLEVE.

13. **BUND/DYKE**
Raised ground or a wall built around a tank or tank farm, to retain spills and prevent their spread, thus reducing hazards.

14. **BURNING RATE**
The value is the rate (in millimetres per minute) at which the depth of a pool of liquid decreases as the liquid burns.

15. **CAS (CHEMICAL ABSTRACT SERVICE REGISTRY NUMBER):**
The unique identification number assigned each compound/chemicals registered with the Chemical Abstract Service (CAS) is listed to aid in quick identification of the compound.

16. **CARCINOGEN**
A substance capable of producing cancer (carcinoma).

ANNEXURE – 19

Continue…

GLOSSARY OF TERMS AND DEFINITIONS

17. CHRONIC
Of long duration or having frequent recurrence. Chronic health effects are those that become apparent or continue for some time after exposure to hazardous chemicals.

18. COMBUSTION PRODUCT
Material produced or; generated during the burning or oxidation of a material.

19. CONTAMINANT
A harmful, irritating or moisture material that is foreign to the normal atmosphere.

20. DANGEROUS OCCURRENCE
Dangerous Occurrences include bursting of vessel collapse of crane, derrick, hoist, explosion, fire, leakage, escape of any molten metal / hot liquid, explosion of receiver /container, collapse of building/ structure, as specified under schedule of Rule 103 of GFR 1995 and provision under section 88-A of the Factories Act 1948, where in a factory any dangerous occurrence as specified occurs weather causing any bodily injury or disability or not.

21. DENSITY
The mass of Unit Volume of a substance e.g. kg/M^3

22. DISASTER
A disaster is catastrophic consequence of a major emergency / accident that leads to, not only extensive damage to life and property but also disrupts all normal human activity for a pretty long time and requires a major national and international effort for rescue and rehabilitation of those affected.

23. DISTRICT CRISIS GROUP(DCG)
"District Crisis Group" means
a. The District Crisis Group is the apex body in the district to deal with major chemical accidents and to provide expert guidance for handling chemical accidents.
Ref; Schedule 7 of Rule 8 of Chemical Accidents (Emergency Planning, Preparedness & Response) Rule, 1996.

24. DOMINO EFFECT
An effect by which a small hazardous incidence in a unit can escalate to surrounding area causing heavy damages to man, properties &environment.

25. DOW Index
Dow index is system of indexing fire, explosion & toxicity level so as to categorized plant/ section into different hazard zones involving fire, explosion & toxicity hazards.

26. EMERGENCY
Emergency means a situation leading to a circumstance or set of circumstances in which there is danger to the life or health of persons or which could result in big fire or explosion or pollution to the work and outside environment, affecting the workers or neighbourhood in a serious manner, demanding immediate action. (Ref. Para 2(j) of Part I of Schedule XIX of Gujarat Factories Rules 1963(1995).

27. EMERGENCY INFORMATION PANEL
Every Goods carriage used for transporting any dangerous or hazardous goods shall be legibly and conspicuously marked with an emergency information panel in each of three places of the carriage.

28. ENDOTHERMIC PROCESS
A process accompanied by the absorption of heat.

29. EVACUATION
Removal of residents and other persons from an area of danger.

30. EXOTHERMIC PROCESS
A process, in which energy in the form of heat is released.

31. FIRE BALL
The burning of a flammable gas cloud, the bulk of which is initially over-rich i.e. (U.F.L.). The whole cloud appears to be on fire as combustion is taking place at eddy boundaries, when air is entrained.

32. FLAMMABILITY LIMITS (UFL- LFL)
In fuel-air system a range of composition exists outside which a flame will not propagate a substantial distance from a ignition source. The limiting fuel concentration are termed the upper flammable limit (UFL) and lower Flammable Limit (LFL)

ANNEXURE – 19

Continue…

GLOSSARY OF TERMS AND DEFINITIONS

33. FLASH FIRE
A burning of a flammable vapour cloud at very low flame propagation speed.

34. FLASH POINT
This is defined as the lowest temperature at which vapours above a combustible substance will ignite in air when exposed to a flame.

Depending on the test method used, the values given are either Tag closed cup (C. C.) or Cleveland open cup (O, C.) The values, along with those in 6.2 and 6.5 give an indication of the relative flammability of the chemical. In general, the open cup value is about 10o to 15oF higher than the closed cup value.

35. HAZARD
Hazard may be defined as "the potential of an accident." Hazard exists in man and the system of materials and machines.

36. HAZARDOUS CHEMICALS
Any substance or material in a quantity or form which may be harmful to humans, animals, crops, water systems, or other elements of the environment if accidentally released. Hazardous chemicals include, explosives, gases (compressed, liquefied or dissolved), flammable or combustible liquids, flammable solids substance, toxic, corrosives,

oxidizing substance, poisonous and insecticides substances.

"Hazardous Chemicals" means

a. Any Chemical, which satisfies any of the criteria, laid down in Part I of Schedule I and is listed in column 2 of Part II of the schedule.
b. Any Chemical listed in Column 2 of Schedule 2.
c. Any Chemical listed in Column 2 of Schedule 3,. as per provisions given below;

- Rule 68J 1 (a) of GUJARAT FACTORIES RULES 1963 (Amended-1995)
- Rule 2(e) of MANUFACTURE, STORAGE AND IMPORT OF HAZARDOUS CHEMICAL RULES, 1989.
- Rule 2(b) of Chemical Accidents (Emergency Planning, Preparedness & Response) Rule, 1996.

37. HAZARDOUS PROCESS
Any process or activity in relation to an industry specified in the First Schedule under the Section 2(cb) of the Factories Act 1948 (1987).

38. HAZCHEM CODES
The HAZCHEM code system was developed by the British Fire Service for use on vehicles transporting dangerous substances. It consists or either two or three characters. The first characters is a numeral in the range of 1 to 4.
1 – Jets, 2 – Fog, 3 – Foam, 4 - Dry Agent

The second character is a letter selected from the range P, R. S, T, W, X, Y, Z.
Personal Protection – 1. The letter P, R, W or X indicate that a full chemical suit and breathing apparatus should be warn. 2. The letters S, T, Y & Z indicate that breathing apparatus need only be warn if the substances are involved in a fire.
Contain or Dilute – The letters P, R, S, & T indicate dilution while W X Y & Z indicate containment.

The third character when appearing is E indicates that evacuation of persons in the neighbouring areas must be taken into consideration.

39. IC (INCIDENT CONTROLLER)
He has to tackle the situation of operations on process/storage/event/occurrence by taking technical decisions to control the emergency by responding the requisite experienced persons.

40. INDUSTRIAL ACTIVITY
"Industrial Activity" means

i. An operation of process carried out in an industrial installation referred to in Schedule 4 involving or likely to involve one or more hazardous chemicals and includes on-site storage or on-site transport which is associated with that operation or process, as the case may be, or
ii. Isolated Storage, or
iii. Pipeline.

ANNEXURE – 19

Continue…

GLOSSARY OF TERMS AND DEFINITIONS

Industrial activities are given in following;

a. Rule 68(J)(1)(b) of GUJARAT FACTORIES RULES 1963 (Amended-1995)
b. Rule 2(h) of MANUFACTURE, STORAGE AND IMPORT OF HAZARDOUS CHEMICAL RULES, 1989.
c. Rule 2(c) of Chemical Accidents (Emergency Planning, Preparedness & Response) Rule, 1996.

41. IDLH (IMMEDIATELY DANGEROUS TO LIFE AND HEALTH)

The level of concentration immediately dangerous to life or health from which a worker could escape without any impairing symptoms or any irreversible health effect (NIOSH/OSHA). The concentrations are reported either parts per million (ppm) or milligrams per cubic meter (mg/m^3).

42. IGNITION TEMPERATURE

This is the minimum temperature at which the material will ignite without a spark or flame being present. Along with the values in 6.1 and 6.2 above, it gives an indication of the relative flammability of the chemical. It is sometimes called "auto ignition temperature".

43. LC_{50} (LETHAL CONCENTRATION)

Lethal Concentration level for air Bourne toxic substance.

44. LD_{50} (LETHAL DOSE)

The term LD_{50} signifies that about 50% of the animals given the specified dose by mouth will die. Thus for a grade 4 chemical (below 50 mg/kg) the toxic dose for 50% of animals weighting 70 kgs (150 lb) is 70 50 = 3, 500 mg=3.5 gr or less than 1 tea spoonful, it might be as little as a few drops. For a Grade 1 chemical (5 to 15 g/kg) the LD50 would be between a pint and a quart for a 150 lb man.

45. LOCAL CRISIS GROUP (LCG)

"Local Crisis Group" means

a. It is body constituted by Government, in the industrial pocked to deal with chemical accidents and co-ordinate efforts in planning, preparedness and mitigation of chemical accidents.

Ref:. Schedule 8 of Rule 8 of Chemical Accidents (Emergency Planning, Preparedness & Response) Rule1996.

46. MAJOR ACCIDENT

Major Accident means an incident involving loss of the life inside or outside the site or ten or more injuries inside and/or one or more injuries outside or release of toxic chemical or explosion or fire of spillage of hazardous chemical result in 'On Site' or 'Off Site' emergencies or damage too equipments leading to stoppage of process or adverse effects to the environment. (Ref. 1. Rule 68(J)(1)(d) of Gujarat Factories Rules 1963(2004), 2. Rule 2(j) of Manufacture, Storage and Import of Hazardous Chemical Rules, 1989. 3. Rule 2(f) of Chemical Accidents (Emergency Planning, Preparedness & Response) Rule, 1996).

47. MAJOR ACCIDENT HAZARDOUS (MAH) INSTALLION

"MAH installation" means

a. Isolated storage and industrial activity at a site, handling (including transport through carrier or pipeline) of hazardous chemicals equal to or in excess of the threshold quantities specified in column 3 of Schedule 2 and 3 respectively.
   Ref: Rule 2(g) of Chemical Accidents (Emergency Planning, Preparedness & Response) Rule1996.

48. MANOMETER

An instrument that measures gaseous pressure, especially, it is an U-tube partially filled with water / mercury / light oil. The difference in level of the liquid between two sides of tubes indicates the pressure.

49. MORBIDITY

Ability to cause illness of diseases.

50. NFPA

National Fire Protection Association-USA

51. NGO (NON GOVERNMENT ORGANIZATIONS):

Voluntary and social services agencies such as Salvation Army, Red Cross society, Social worker groups, Church Group etc., who provide community support services particularly during emergencies and natural calamities.

ANNEXURE – 19

Continue…

GLOSSARY OF TERMS AND DEFINITIONS

52. NIOSH
National Institute for Occupational Safety & Health-USA

53. ODOUR THRESHOLD
The lowest concentration of an air contaminant that can be detected by smell.

54. OFF-SITE EMERGENCY PLAN
The objective of an Off Site Emergency Plan is to protect the life and property of the neighbourhood areas of the industrial unit. Off Site Emergency Plan shall be prepared by Government Authorities as per Rule 14 of MSIHC Rules 1989 and follow the instruction under provision of CA(EPPR) Rules 1996.

55. ON SITE EMERGENCY PLAN
On Site Emergency Plan is to be prepared by occupier of industrial Units as per Schedule 8A under Rule 68(J)(12) of Gujarat Factories Rules 1963(2004). Ref: Section 41(B)(4) of The Factories Act 1948 , Schedule XI under Rule 13 of MSHIC Rules 1989, and Rule 5,7, & 9 of CA(EPPR) Rules 1996.

56. OSHA
Occupational Safety and Health Administration – U. S. Federal Agency

57. OVER PRESSURE
Maximum pressure above atmosphere pressure experienced during the pressure of a blast wave from an explosion.

58. PLUME
Hazardous gas / vapour / cloud resulting from a continuous source release.

59. PUFF
Plum is instantaneous release of a gas / vapour from the source.

60. POLYMERIZATION
A few chemicals can undergo rapid polymerization to form sticky, resinous materials, with the liberation of much heat. The containers may explode.

61. POOL FIRE
A pool of flammable liquid burning with a stationary diffusion flame.

62. PPM (PARTS PER MILLION)

63. PYROLYSIS
Chemical decomposition by the action of heat.

64. QRA (QUANTITATIVE RISK ASSESSMENT)
QRA is identifying, quantifying & computer modelling of all the potential emergency scenarios.

65. RESPONSE
The efforts to minimize the risks created in an emergency by protecting the people, the environment and the property, and the efforts to return the scene to normal pre-emergency conditions. Persons who perform the various response functions are termed "RESPONDERS".

66. RISK
Risk of an accident may be defined as "the chance or probability or likelihood of an accident being caused in a given man-material-machine system.

67. SENSITIVE POPULATIONS
Groups of people that may be more susceptible than the general population to the toxic effects of the release due to pre-existing health condition (patients in hospitals, pregnant women etc.) or age (elderly people infants, handicaps).

68. SPILL
Spill is large liquid releases from a bulk storage tank/process vessel.

69. SEVERITY RATING

1. The Severity rating of 1, would be termed as most sever which would call for complete evacuation of public at large and would hold potential for sever damage both to life as well as property.
2. The severity rating of 2, would be terms as grave for it would have potential to cause damage to life and a portion of property.

ANNEXURE – 19

Continue…

GLOSSARY OF TERMS AND DEFINITIONS

3. The severity rating of 3, would be termed as high i.e. it has potential effect on life and extensive damage in terms of property.
4. The severity rating of 4, would be terms as moderate i.e. would call for partial evacuation as well as activation of material aid.
5. The severity rating of 5, would be terms as low. This would have both localized effect mostly in terms of property damage and would call for declaration of local emergency.

70. SMC : SITE MAN CONTROLLER

He is overall responsible for directing operations & decide the actions, consulting with incident controller &seniors, and handle &control the emergency.

71. SHORT – TERM INHALATION LIMIT (STEL)

The parts of vapour (gas) per million parts of contaminated air by volume at 25oC (77oF) and at one atmosphere of pressure is given. The limits are given in milligrams per cubic meter for chemical that form a fine mist or dust. The values given are the maximum permissible average exposures for the time periods specified.

72. SPECIFIC GRAVITY

The specific Gravity of a chemicals is the ratio of the weight of the solid or liquid to the weight of an equal volume of water at 4oC (or at some other specified temperature) If the specific gravity is less than 1.0 (or less than 1.03 in sea water) the chemical will float, if higher it will sink.

73. TLV (THRESHOLD LIMIT VALUE)

TLV refer to airborne concentration of substances. There are three categories of TLV.
TLV – TWA - Time Weighted Average.
TLV - STEL – Short term Exposure limit
TLV - for gases and vapour is usually expressed in PPM. (Part of the gas/vapour/million parts of air) mg/m3 : milligram/cubic meter.

74. Toxic Cloud

Air borne mass of gases, vapours, fumes, dust or aerosols of toxic materials.

75. Toxicity

The ability of a substance to cause damage to living tissue, impairment of the central nervous system, serve illness or death when ingested, inhaled or absorbed by the skin.

76. VAPOUR CLOUD

Air borne dispersing hazardous vapours, which may or may not be visible as a "Cloud"

77. VULNERABILITY

It can be defined as "the zone of influence of an emergency in and around the facility concerned.

78. WATER FOG

A finely divided mist produced by either a high or low velocity fog nozzle. It is used for knocking down flames and cooling hot surfaces.

OFF SITE EMERGENCY PLAN

PART – II

PAC ANALYSIS

BARDOLI & MAHUVA LOCAL CRISIS GROUP

: Prepared By :

LOCAL CRISIS GROUP
BARDOLI & MAHUVA INDUSTRIAL POCKET

SEPTEMBER-2024

PAC ANALYSIS FOR EMERGENC SCENARIOS

1. INTRODUCTION

The PAC analysis is a method developed by PRESTELS for developing Emergency Response Plan for a particular emergency scenario. The PAC analysis clarifies the roles and responsibilities of various responders, actions to be taken and communication to be made. The PAC analysis throws light on the resources required to combat emergency. It also draws attention to the pacific's of communication that must be made.

1. P-A-C

The term PAC stands for Person – Action – Communication during an emergency, each responder is required to take certain Action and make certain Communication. The PAC analysis charts the Actions to be taken and the Communication to be made against every responder. The analysis begins at the onset of signs for a looming disaster and ends with the 'calling-off' of the off-site emergency.

2. Person

The person is an individual authority or role such as District Collector or Site Controller. It may also be group of people such as Police Constables, Bus Drivers or NGOs volunteers.

3. Action

The action is an act undertaken by person such as assessment of damage potential or projection of vulnerable zone or transportation of person from one place to another or diversion of traffic.

4. Communication

Communication is a message communicated from one person to other person(s) to initiate actions from the person(s) to whom the message is communicated.

2. EXPLANATION OF COLUMNS ON THE PAC SHEET

1.1 Person

1.2 Primary

Here, enter name of authority, role such as District Collector, Police officer or Site Incident Controller Enter the name of persons in brackets.

1.3 Alternate

Here, enter name of person who will assume temporary charge in absence of the person listed in the Primary.

1.4 Action

1.5 Act

Here, enter the activities to be undertaken such as Assess Damage, Divert Traffic and others by Concerned persons.

1.6 Resource

Here enter the resource(s) required by the person to carry out his Act sufficiently and efficiently. e.g.: Nose Masks, Ambulances, Water etc.

1.7 Communication

1.8 Whom

Here enter the authority, role to whom the communication must be made. Enter the name of person in brackets

1.9 How

Here, enter the means of communication and phone numbers as:

INT: for internal line numbers

O: for office landline numbers

R: for residence landline numbers

M: for mobile numbers

1.10 What

Here, enter the specifics of message to be communicated

1.11 Remarks

This section is to be used for making observations on the Person – Action – Communication proceeds. This section may be filled during a Mock Drill exercise

1.12 Time

Here, enter the clock time at the completion of a particular Person – Action – Communication Sequence.

.

1.13 Resource Gap

Here, enter the shortcoming in resources and additional resources necessary.

1.14 Communication Gap

Here, enter communication gaps observed.

1.15 Other

Here, enter other observations, comments or suggestions.

3. SERIAL NUMBERING RULES FOR PAC SHEET

Every row of PAC corresponds to the entity 'Person'. Number rows as '1, 2, 3…etc.' for every 'Person', there will be numbers of actions. Label 'Act' as 'a, b, c…etc.' Every 'Act' will have its resource requirement. Label 'Resources' as 'a, b, c…etc.' corresponding to the respective 'Act'. Likewise, one 'Person' may have to communicate too many others. Under communication

Columns, label 'Whom' as 'a, b, c…etc.' and label the 'How' and 'What' as 'a, b, c…etc.' corresponding to the 'Whom' respectively. (See examples for clarity of labelling serial numbers. Wherever required grouping of serial numbers such as 'a, b)' or 'a-f)' is permitted.

Where only one item exists labelling can be dropped. However, every label in 'Act' column must have a corresponding label in 'Resources' column and every label in 'Whom' column must have a corresponding label in 'How' and 'What' column. In case a particular 'Act' does not require any 'Resources', then the entry may be made as '-' in the Resources column.

4. BENEFITS OF PAC

The benefits of PAC are as under:

- Clarity of roles and responsibilities to people involved in emergency management.
- Identification of resource gaps for resource planning and procurement.
- Specificity of communication and improvement in communication messages, which is crucial to efficient response mitigation.
- Improved specificity of observations during mock-drills and identification of improvement opportunities.
- The PAC can be a very effective tool for training emergency responders

5. CASE STUDY 1 - CHLORINE LEAK

1. Scenario

A chlorine pipeline connected to the bulk storage tank is ruptured. Initially about 500 kg of liquid Chlorine leaks out creating a major emergency. The flow is stopped by applying special cement, and the transfer of chlorine to the spare tank is started. However, there is a danger of escalation because the cement could give way to the internal pressure before the transfer is completed. Thus, the off-site plan is activated including evacuation. The scenario incorporates situations illustrating how the plan is activated, how each responder responds and what problems arise.

2. Development

The incident occurs at 4-30 pm when the second shift has started. As soon as the emergency occurs, the shift maintenance engineer assumes charge of Incident Controller. The Dy. Chief Engineer who is in charge of the factory at that time assumes the charge of Site Controller. He informs the District Collector, Fire Brigade, Police, Medical Officer and other agencies. He informs the Chief Maintenance Engineer, who arrives and takes over as the Incident Controller. He informs the CEO/Manager, who immediately reaches factory and then takes over as Site Controller from Dy. Chief Engineer.

The RDC who was in the office when the message is received assumes the charge and informs the Collector who reaches office in 15 minutes. Before the Collector arrives, the RDC has activated the Plan and has informed the Fire Brigade, Police, Medical Officer, Transport provider among responders and has confirmed that they have received the information and have initiated their action.

Meanwhile the Site Controller procures and projects the details on extent of emergency and informs it to the District Collector, Fire Brigade, Police and other responders. He informs that the situation is getting under control but can develop into a major emergency requiring intimation to public to stay confined indoors and evacuation from certain areas. He also identifies the area likely to be affected and gives the details to the agencies.

The Police block the traffic, send a vehicle with loud speaker to alert public to go stay confined indoors. Those who are on the streets are directed to walk crosswind.

Police realize that a public meeting is going on an open ground nearby. A constable is sent to ask the public to walk away in

particular direction and get inside confined shelters. The leaders of the political party conducting the meeting (which is the opposition party) take it amiss and refuse to disperse, taking it as a ploy to prevent their meeting. A senior officer is deputed with a police van. The leaders understand the gravity and situation is under control. People start evacuating the ground.

In a nearby cinema house a show is going on. Police inform the manager of cinema theatre. An announcement is made to ask the people to stay inside. The air conditioning system is stopped. As the AC system is stopped the people are uncomfortable and in bad mood. Situation is tactfully controlled.

Hutments near the factory, are not "gas-proof", staying inside is not safe. The Collector asks State Transport to dispatch buses to undertake evacuation. The ST drivers refuse, questioning about their safety. There are no PPE for them. They are persuaded to go with wet cloth tied over the nose. A decision is taken to evacuate women, children and old people first. They are shifted to "shelters" (such as school). Food and water arrangements are made through the civil supplies department and help from NGOs.

There is a milk dairy in the vicinity. The cattle are in open sheds and hence not safe. Evacuation is difficult. The diary owners are asked to cover the sides of the sheds by tarpaulin sheets, which are provided by the nearby supplier. People affected by chlorine are shifted to hospitals and treated by medical teams.

The Fire Brigade tenders help the Incident Controller to establish water curtains.

Ambulance is kept ready near the incident-spot, in case anybody from the incident controller's team gets affected.

The District Collector continuously monitors the actions being taken and ensures proper coordination amongst the responding agencies. The District Collector also requests for additional assistance from the neighbouring districts and the State Authorities. The Collector also is constantly in touch with the Site Controller at the factory to know the status and to ascertain the developing situation. (For example, the wind direction may change, leak may aggravate.)

The Incident Controller and his team work hard and ensure that the emergency does not escalate further and Chlorine is transferred from the affected tank to the spare tank.

When the Chlorine transfer to safe spare tank is complete, the Site Controller informs the District Collector, who calls off the emergency.

Arrangements are made to ensure that the people who were shifted from the hutments are again brought back to their homes. The Factory Inspectorate initiates accident investigation. The Pollution Control Board alerts the District Collector on the possible pollution and its effects on near and distant future. The long term clean up and post-emergency restoration activities and initiated.

6. CASE STUDY 2 - TRANSPORTATION EMERGENCY

6.1 Scenario

Tanker carrying highly flammable naphtha overturns on mountainous road (goat) and develops a leak after its valve is damaged. The leak is minimal but can develop further if untreated. The driver and his assistant (cleaner) are luckily not injured. The tanker belongs to Kerala state and accident takes place in Karnataka state.

6.2 Development

- The driver, using his cell phone, tries to call the Police Control Room but the network is weak. Meanwhile, the cleaner requests a passing vehicle to report the incidence to the next police station on way.

- The driver succeeds in calling the Police Control Room and informs them about the type of emergency, location and what help is required. The driver also tries to contact his employer. (The Police also receive information from the driver of a passing vehicle, which had seen the overturned vehicle.)

- The cleaner tries to keep the moving traffic as far away as possible by using stones and tree branches. (He improvises because he is not carrying the equipment for road blockage like the portable plastic cones or a barrier stand). He is unable to repair or stop the leak.

- Some local nomads gather and try to collect the leaking liquid. Driver tries to stop them, warns them about the hazard.

- Traffic jam ensues.

- The police team reaches the spot. The police control room alerts and transmits information to District Collector, Fire Brigade, Medical Office, Police headquarters for additional staff to control the situation. The District Collector declares and off-site emergency. The technical team to repair and stop the leakage, a spare tanker and a crane to move the overturned tanker is called for.

- The driver briefs the police who have arrived at the spot and they immediately stop the traffic, and also disperse the crowd local nomads. ™.

  (Observe that first the driver and later the police team are the 'Incident Controllers'. The officer at the Police Control Room is the 'Site Controller')

- The technical team arrives and the leader of the team takes charge as the 'Incident Controller'. The repairs stopped the leakage, but it is decided that the tanker will be emptied before it is made to stand on its wheels. The fire brigade arrives and is kept on standby in case its service is required. The spare tanker, requested earlier, arrives. The transfer is started. The crane arrives and the overturned tanker is lifted. The police regulate the traffic and the jam is gradually reduced. The incident is brought under control. The off-site emergency is called off and the post-emergency operations are initiated.

  (Note: The following PAC draft may show the same communication or task being done by multiple agencies. This is to ensure that intimation has reached at least from one source or action is initiated in fastest possible manner.)

7. ROLE OF INCIDENT CONTROLLER AND SITE CONTROLLER

The Site Controller and the Incident Controller are the two vital roles in the management of emergency. This note seeks to clarify the two roles.

1. Incident Controller

The incident controller is responsible for attending to the source or the cause of emergency. He leads the team involved in repairing, controlling and preventing escalation at the source. He is expected to have the required technical knowledge, skill and resources required to attend to the incident causing emergency. For example, if there is a crack in a pipeline carrying toxic gas, he ensures that the valve on the supply line is closed and repairs the damaged pipeline. If a bulk Storage tank has a crack, transfer of the contents to a spare tank is started and repairs undertaken.

The incident controller co-ordinates with only the 'Site Controller' (see below). The incident controller must ask for any additional help (staff, tools, material, equipment etc required for dealing with the incident) from the Site controller. The site controller will arrange for the same at the earliest. This enables incident controller to concentrate on his job of attending to the incident without being burdened by communication tasks. Also, in the normal course, the incident controller does not directly interact with the outside industry authorities and agencies such as the District Collector, Fire brigade, Police etc. This is done by the site controller.

The incident controller gives continuous feedback about the status of the operation to the site controller.

2. Site Controller

The 'Site Controller' is overall in-charge of the operation at the incident-site. While the incident controller attends to the source or the cause of emergency, the site controller will be in the Emergency Control Room (ECR). The ECR is a place to be

well equipped with telephones, drawings and maps, computer programs for dispersion modelling etc.

The site controller ensures that the off-site responders (District Collector, Police, Fire Brigade etc) are given quick intimation. He also ensures prompt assistance to the requirements of the incident controller. He may have to arrange the assistance from the factory itself or get help from outside (from fire brigade, mutual aid member, stockiest etc). He will continuously monitor the progress and give information to the offsite responders. He will identify the areas likely to be affected and communicate the same to the responders. He will update all concerned responders with the emergency status. For example: Escalation in the emergency, change in wind direction etc. The site controller will also communicate the necessary information to the media and public at large. In short, the site controller acts as the focal point who on the one hand interacts with the incident controller to give him required assistance and know the status and on the other hand, interacts with other district authorities and agencies to give information.

3. Temporary Assumption of Roles

It needs to be noted that 'Incident Controller' and 'Site Controller' are emergency roles. It is not necessary that only the one person will act as incident controller / site controller from beginning to end. For example, when a valve fails and toxic gas starts leaking, the person on the spot assumes the charge of incident controller till a senior expert, personnel (appointed incident controller) reaches the spot and takes over from him. This will be especially true when the incident happens during a late night shift, when only the skeleton staff may be present. Similarly, a senior person present will assume the charge of site controller till the manager / CEO (appointed Site Controller) reaches the factory and takes over.

For a transport emergency, the driver may be the first incident controller till the Police team and subsequently a technical team reaches with tools to take care of the emergency. Then the police and later the technical team leader will be incident controller.

It may be mentioned that it is difficult to lay down specific and rigid guidelines in this respect. What is important is that the relevant functions are carried out efficiently, smoothly and promptly. There should be no loss of time, there should be no conflict, and the aim should be to bring the emergency control as fast as possible with least damage or loss.

8. PAC ANALYSIS FOR EMERGENCY SCENARIOS - EXPLANATION SHEET

SR.	Person		Action		Communication			Remarks (To be filled by observers during mock drill trial)			
	Primary	Alternet	Act	Recourse	Whom	How	What	Time (Min)	Recourse Gap	Communication Gap	Other
1	Incident Controller	(Name Of Incident Controller)	Action Required By Incident Controller	Recourse Required To Carry Out To Assigned Action	What Is To Be Contacted	How Is The Person To Be Contacted	What Is Massage To Be Communicated	Time Taken	Recourse Gap Observed	Communication Gap Observed	Other Remarks, If Any
2					Police Officer	Mobile-Landline	Extent Of Damage ,Extent Of Disaster Possible				

Emergency Scenario Description: 10T Chlorine Bullet leak at ABC Chemicals, Anandnagar (0261)

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY

Sr.	Person		Action		Communication		
	Primary	Alternet	Act	Recourse	Whom	How	What
1.	Incident Controller		A)Attend To Leakage With Maintenance Team B)Start Transfer Activity C) Use Neutralizing Medium For Spilled Liquid, Fog And Curtain To Prevent Spread.	A)Team Of Trained Works, Equipment For Repairs , Emergency Kit ,Local Exhaust,Scbas,Special Quick Setting Cement B) Permanent Piping Arrangement For Transfer To Other Storage Vessel. C)Neutralizing Medium, Gas Scrubbing Arrangement, Water For Creating Fog And Water Curtain	Site Controller		Chlorine Leak From Pipe Of Bulk Storage Tank ,Flow Being Stopped Temporarily Bye Using Cement Transfer Being Started Help Of Fire Brigade For Fog And Water Curtain Needed Assessed Quantity Spilled About 3 Kg And That Leak May Start Again If Cement Gives Way.
2.	Site Controller		B)Coordinate Actions With Incident Controller For Staff ,Matirial,Equipment,Experts Advise And Arrange For Help C) Identify If All Workers Are Safe And Arrange For Rescue Where Necessary.	Templates, Windsock, Plant And Area Map B)Internal Telephone C)Transport For Injured D)Communication Centre	A) District Collector B) Police C) Fire Brigade D) Factory Inspector E) Mutual Aid Representative G) Media		A-F) The Nature Of Emergency ,Consequences ,Area Likely To Be Affected Presently And If Emergency Is Escalated, What Help Is Required G) Nature Of Emergency, Area Likely To Be Affected And Precautions To Be Taken By Public At Large.

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY (CONTINUE...)

Sr.	Person		Action		Communication		
	Primary	Alternate	Act	Resource	Whom	How	What
3.	District Collector	Asst. District Collector	A) Conform That Police Fire Brigade And Medical Officer Have Received Information And Activated Their Plan. Direct Them Suite Bly. B) Direct Concerned Revenue Official For Evacuation, Sheltering Arrangement Wherever Necessary. C) Monitor Situation At Factory Continuously And In The Affected Area And Issues Directions To Responders. D) Requisition From Authorities And Agencies (Both Government And Private) Such As Transportation, Water , Electricity Providers As Necessary. E) Arrange Media Centre To Give Information To Media, Public, Families.	A-D) Area Map Vulnerably Ability Templates ,Telephones E)Communication Centre	A)Police B)Fire Brigade C)Medical Officer D)State Transport Depot Manager Electricity Board Official F)Water Supply Officer (Mr. Arun Lyer) G) Supply Officer (Revenue Dept.) (Mr. S. G. Kulkarni) H)Station Master , Anandnagar I) Media J)Outside District Authorities (Neighbouring Districts ,State Authority)		A) Inform Police About Nature Of Emergency Per Sifting Wind Direction, Affected Areas, Isolation Area, And Arrangement For Warning And Preparation For Evacuation. B) Inform Fire Brigade Abo Requirement Us Nature Of Emergency ,Wind Direction ,Casualties In The Factory ,Rescue Requirement ,Mitigation Requirements. I) Arrange For Informing Public Through Local Cable Tv, Sms, Local Fm Radio, Pa System. Stop The Traffic On The Railway Line Passing Through The Area Likely To Be Affected. Shelters, Food. H) Direct Station Master, Anandnagar To And Instruct Him To Be Ready To Arrange To Evacuate People In Coordination With Police And To Arrange For Providing Safe Tenuous Water Supply With Proper Pressure. G) Alert Supply Officer (Revenue Dept.) Constant Electric Supply To The Area. F) Direct Water Supply Officer To Ensure Con- From Dc/Police. E) Direct Electricity Board Officials To Ensure Area. Direct Him To Keep Buses Ready With Drivers, Full With Fuel And Await Instructions D) Inform State Transport Depot Manager About Nature Of Emergency, Likely Affected Likely To Be Affected. Direct Medical Officer To Alert Hospitals In The Area. C) Inform Medical Officer About Nature Of Emergency, Casualties In The Factory, Area J) Request For All Additional Help Required To Mitigate The Emergency.

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY (CONTINUE...)

Sr. No.	Person		Action		Communication		
	Primary	Alternate	Act	Resource	Whom	How	What
4.	Fire Brigade Chief	Deputy Fire Chief	A) Arrange For Water Curtains And Fog Around The Spilled Liquid Chlorine In Association With The Factory Fire Team. B) Rescue The Affected Persons. Evacuate Them And Other Casualties And Hand Over To Medical Team.	A) Water, Nozzles For Fog And Curtain, Fire Tenders, Scbas. B) Fire Tender With Extendible Ladders , Scbas, Stretchers, Arrangement To Lower The Stretchers From Height.	A) Fire Brigade (Neighboring District) B)Medical Officer C) District Collector		A) Request For Fire Tenders. B) Inform Location Of Effected Rescued Persons. C) Request For Additional Assistance From Fire Brigade Of Neighboring Cities, Districts If Required.
5.	Police Superintendent	Deputy Police Super-Intendment	A) Cordon Off Area, Stop Traffic Going Towards Effected Area. B) Arrange For Warning Public. C) Arrange For Personnel At Various Spots To Maintain Law And Order .D) Send Police To Public Congregation To Ask Them To Stay Confined. E) Make Arrangements To Evacuate Dwellers From Neighbouring Hutments, Which Are Likely To Be Affected. Hand Over Charge Of Evacuees To Revenue Officer. F) Interact Continuously With Site Controller And District Collector.	A) Barricades' B) Pa System Fixed On Jeeps. E) Police Personnel, Vehicles F) Telephone	A) Commandant Home Guards B) Commandant Civil Defense C) State Transport Manager D) District Collector E) Neighboring District Headquarters		A) Inform Where They Are Needed And About Action To Be Taken. B) Inform Where They Are Needed And About Action To Be Taken. C) Request To Arrange Buses To Evacuate People From Public Congregation And Hutments. D) Inform Ground-Status And Request For Additional Arrangements Or Measures To Be Taken. E) Inform Emergency And Ask For Additional Staff And Resources.

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY (CONTINUE...)

Sr. No.	Person		Action		Communication		
	Primary	Alternate	Act	Recourse	Whom	How	What
6.	Medical Officer	Asst. Medical Officer	A) Arrange For Ambulances, Doctors And Staff. B) Arrange For Oxygen And Other Requirements For Emergency Treatment.	A) Ambulances, Doctors, Nursing Staff B) Oxygen Cylinders	Identified Hospitals And Doctors		Inform About Nature Of Emergency, And Ask Them To Be Ready For Treatment. Inform About Likely Number Of Casualties And Ask Them To Make Beds Available Promptly, Dispatch Ambulances And Pick Up Casualties In Coordination With Police And Other Authorities.
7.	State Transport Manager	Asst. State Transport Manager	A) Keep Vehicles Ready With Drivers And With Sufficient Fuel. Ascertain Number Of Buses , Pick Points, Routes And Destinations From District Collector And Police. Dispatch Vehicles With Necessary Instructions To Drivers As Directed By Police / District Collector For Evacuation, Or For Transportation Of Provisions. B) Arrange For More Vehicles From Other Depots If Required.	A) Buses, Water Tankers, Drivers. B) Telephone	A) Police/ District Collector B) Other Depots For Additional Vehicles		A) Details Of Requirements Of Buses, Pickup Points, Routes, Destinations B) Requirement For Additional Vehicles
8.	Factory Inspector In-Charge Dy. D I S H, Surat	Deputy Factory Inspector	A) Visit Site In Coordination With Technical Experts. B) Investigate Accident In Due Course.	A) Transport Arrangement. B) Investigation Form	A) Experts B) Mutual Aid Members		A) Inform About Emergency And Seek Their Technical Advice. B) Direct To Provide Assistance In Handling Emergency.

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY (CONTINUE...)

Sr. No.	Person		Action		Communication		
	Primary	Alternate	Act	Resource	Whom	How	What
9.	Technical Experts	CMO, Reliance	A) Respond With Appropriate Technical Advice To The Factory, District Collector, Police, Fire Brigade, Medical Officer, Factory Inspector. B) Visit Site In Coordination With District Collector, Factory Inspector To Provide Necessary Advice	A) Own Expertise, Technical Reference Library, Internet Facility, Telephone B) Vehicle	A) Factory B)Factory Inspector C) District Collector D) Fire Brigade E) Medical Officer		A-E) Technical Advice For Handling Emergency
10.	Pollution Control Board Member	GPCB Officer	Project Areas To Be Affected And Monitor Chlorine Concentration Levels At Various Spots	Monitoring Equipment			
11.	Electricity Board		Ensure Uninterrupted Electric Supply To The Factory And At Shelters				
12.	Animal Husbandry		Provide Necessary Care For Cattle Of The Dairies, Arrange For Veterinary Doctor.		Veterinary Doctor		Look After The Cattle
13.	Agriculture Department		-				
14.	Civil Defense And Home Guards		A) Co-Ordinate With Police And Arrange To Control Traffic, Assist In Evacuation. B) Assist Police For Security Of Evacuated Property.	A, B)Staff	Police		Information Regarding Evacuation And Traffic Control Arrangements

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY (CONTINUE...)

Sr. No.	Person		Action		Communication		
	Primary	Alternate	Act	Resource	Whom	How	What
15.	Pwd/Water Supply		A) Ensure Continuous Water Supply With Adequate Pressure For Fire Brigade. B) Arrange Drinking Water At Shelters. C) Ensure Water For The Cattle.	A)Water, B)Drinking Water C)Water For Cattle			
16.	Civil Supplies Department		Arrange For Food, Water And Other Basic Amenities As Necessary For Evacuees	Food, Water And Other Basic Amenities			
17.	Railway Station Master		A) Stop Trains Passing Through The Affected Area As Advised By District Collector. B) Coordinate With Police If Evacuation Is Necessitated	(A,B)			Ground Status Reporting
18.	Head Of Local Government Body		Mobilize Resources Required Under The Control Of The Body Like Buses, Shelters (Community Halls, Town Hall, Schools), Food And Water Supply	Emergency Shelters, Food And Water Supply	District Collector		Find Out Resources, Personnel Help Required
19.	Telecommunication Department		Ensure That Communication Lines Are Efficiently Working				

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY (CONTINUE...)

Sr. No.	Person		Action		Communication		
	Primary	Alternate	Act	Resource	Whom	How	What
20.	Ngo		A) Assist Emergency Responders. B) Help Families Of Casualties, Counsel Victims.	(A,B)			
21.	Media Gujarat Mitra		Disseminate Vital Information To Public In A Responsible Manner		Public At Large	Media Channels	Precautions And Actions To Be Taken By Public
22.	Driver	Co-Driver	A) Call The Police. Request Passing Vehicles To Inform The Police, If Phone Out Of Range. B) Stop Vehicles And Divert Traffic Away From Leaking Tank. C) Warn People By Putting Up Display Board Stating 'Danger'.	A) Phone B) Road Blocking Arrangement C) Display Board Of 'Danger'	A) Police Control Room B) Employer		A) The Tanker Carrying Highly Flammable Naphtha Has Overturned, There Is Leakage From The Valve And There Is A Danger Of Fire And Possible Explosion. Details Of Location. Traffic Has To Be Stopped. Repairs Needed And Spare Tanker For Transfer Of Material Required. Crowd Is Gathering And Needs Quick Control.
23.	Police Control Room	Police Control Room			A) Nearest Police Station B) District Collector C) Fire Brigade D) Medical Officer E) Mutual Aid Group Coordinator		A-E) The Details Of The Incident And Details Of Exact Location.

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY (CONTINUE...)

Sr. No.	Person		Action		Communication		
	Primary	Alternate	Act	Resource	Whom	How	What
24.	Leader Of Police Team At The Spot	(Range 1)	A) Stop Traffic From Both Directions. B) Cordon Off Area To Ensure That People Are At Safe Distance C) Ensure That There Is No Source Of Ignition Like A Smoking Bidi/Cigarette. D) Ensure That There Is No Blockage Of Smooth Arrival Of Emergency Responders.		Police Control Room		Request For Enforcements, If Needed, Update On Status At Site.
25.	District Collector	Assistant District Collector	Ascertain Type Of Accident And Possible Consequences		A) Fire Brigade B) Medical Officer C) Mutual Aid Group D) Road Transport Authority E) Provider Of Crane, Spare Tanker With Pumping Arrangement F) Inspector Factory		A-C Inform About The Incident Etc, If They Have Not Received It Earlier, Monitor Progress Of Action Taken. D) Inform About The Incident And Location, And Direct Him To Arrange For A Crane And A Spare Tanker. Not Received It Earlier, Monitor Progress Of Direct Him Further To Reach The Spot. E) Requisition For Resources Such As Crane, Spare Tanker With Pumping Arrangement, If Required. F) Inform About Incident And Direct To Seek Appropriate Technical Advice.
26.	Fire Brigade Chief	Deputy In Charge-Fire Brigade	Send A Fire Tender To The Spot.				

9. PRESTELS PAC ANALYSIS FOR EMERGENCY SCENARIOS - ILLUSTRATION PURPOSE ONLY (CONTINUE...)

Sr. No.	Person		Action		Communication		
	Primary	Alternate	Act	Resource	Whom	How	What
27.	Medical Officer	Asst. Medical Officer	Arrange To Send An Ambulance From A Source Nearest To The Spot.	Ambulance	Hospitals		Inform About The Incident. Request Them To Be In State Of Readiness If There Are Fire/Explosive Casualties.
28.	Road Transport Authority Chief	Deputy Officer, RTO	A) Arrange For Resources Required Such As Crane, Spare Tanker With Pumping Arrangement. B) Proceed To The Spot For Rendering Assistance. C) Initiate Accident Investigation	A) Resource Directory B) Vehicle C) Accident Investigation Report Format	Nearest Provider Of Crane, Spare Tanker With Pumping Arrangements		Requisition For Crane, Spare Tanker With Pumping Arrangement.
29.	Factory Inspector Dy. D I S H, Surat	Deputy Factor Inspector Mr. K.A. Rawat	A) Arrange For Technical Assistance From Technical Experts. B) Direct Mutual Aid Group To Render Assistance.	A) Resource Directory B) Telephone			
30.	Mutual Aid Group Coordinator	Disaster Mgmt Center Hazira	A) Arrange For Resources Required Such As Crane, Spare Tanker With Pumping Arrangement. B) Proceed To The Spot With Technical Experts For Rendering Assistance.	A) Available Resources B) Vehicles, Transport Arrangement	A) District Collector B) Police C) Fire Brigade D) Rta		A-D) Inform And Offer Available Resources To Mitigate The Emergency.
31.	Owner Of Vehicle Involved In Above Accident	Manager At Owner's Facility	A) Arrange For Resources Required Such As Crane, Spare Tanker With Pumping Arrangement B) Proceed To The Spot For Rendering Assistance	A) Available Resources B) Vehicles, Transport Arrangement	A)District Collector B) Police C) Fire Brigade D) Rta E) Neighboring Owners Of Such Transportation Companies.		A-D) Inform And Offer Available Resources To Mitigate The Emergency E) Inform About Incident Details And Seek Assistance

OFF SITE EMERGENCY PLAN

PART – III

MSDS

BARDOLI & MAHUVA LOCAL CRISIS GROUP

: Prepared By :

LOCAL CRISIS GROUP
BARDOLI & MAHUVA INDUSTRIAL POCKET

SEPTEMBER-2024

BARDOLI & MAHUVA LOCAL CRISIS GROUP

LIST OF M.S.D.S. (SELECTED)