



## Industrial Estates Planning considering safety and disaster management

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- This session may attract :- planners, developers of industrial estates/SEZ, disaster managers, regulators, etc.
- The zonation for **various types of the industrial activities like, storage, process, waste management, etc. is important.**
- The **mitigative measures (fire fighting, hospital, rescue, etc) should also be in the priority since planning.**
- The presentation is based on some of the case studies.

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## Disasters vis a vis causes



- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Fire / explosion.</li><li>• Chemical spill</li><li>• Radiation leak</li><li>• Flood</li><li>• Major environmental damage</li><li>• Security</li><li>• Natural Disaster</li><li>• Bomb threats, sabotage, etc.</li></ul> | <ul style="list-style-type: none"><li>• <b>MAH</b> (Major Accident Hazards) establishment: <b>threshold quantity of the chemicals stored/processed</b></li><li>• <b>MAH: Onsite Emergency Management Plan</b></li><li>• <b>Civil Administration: Off-site Emergency Management Plan</b></li><li>• <b>Drills</b></li></ul> |
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## Why do we need ?



To be ready at any time with :

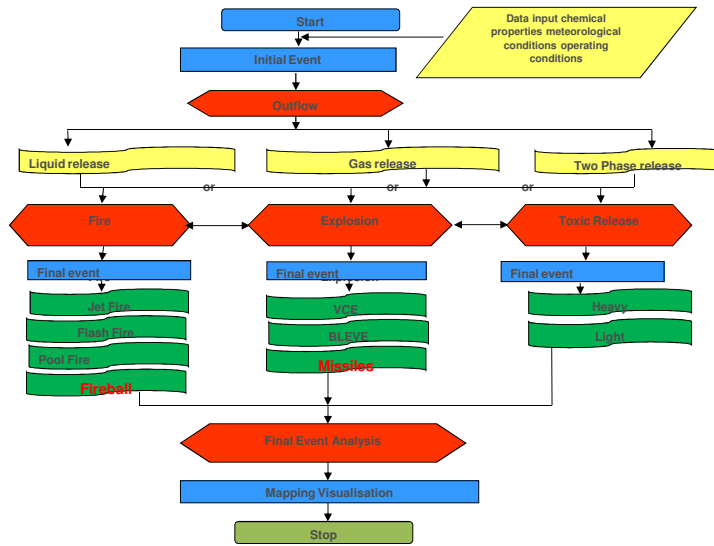
- Dedicated/Adequate organization
- Adequate equipments
- Trained Staff
- Compliance of existing regulations
- Inventory of Chemicals
- Creation of exclusive facilities for hazardous chemicals, and transportation corridor.
- Dedicated facilities of fire fighting, medical care, transportation and



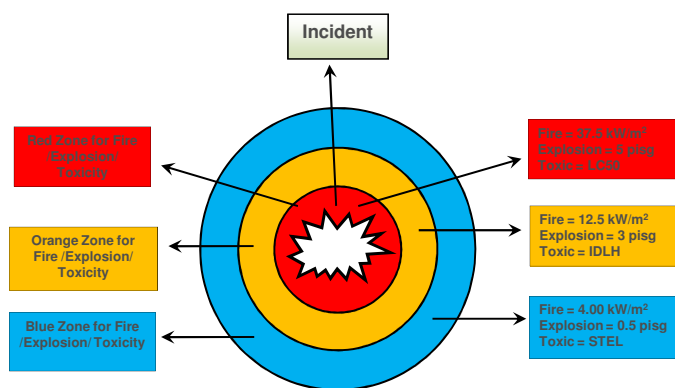
## Bulk storages of chemicals: variation in vessels and quantities



## Behaviour of chemical released

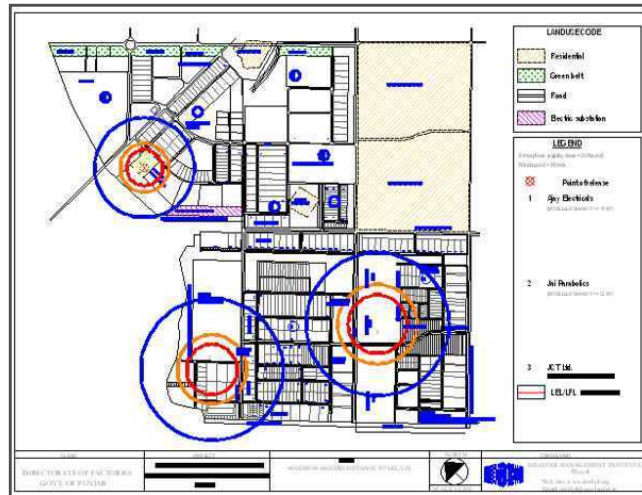


## Hazards

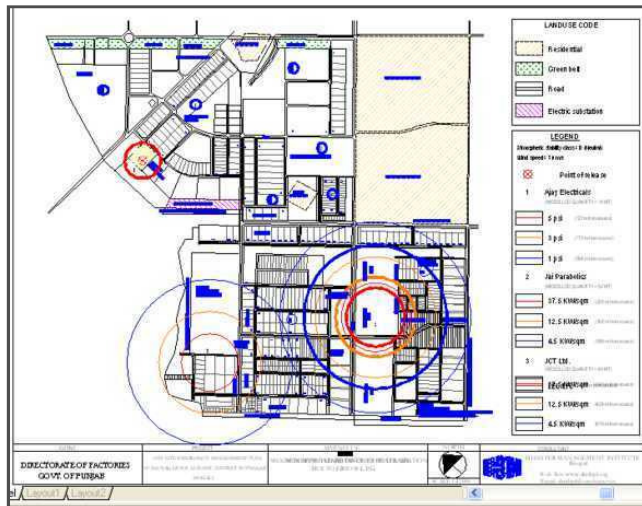




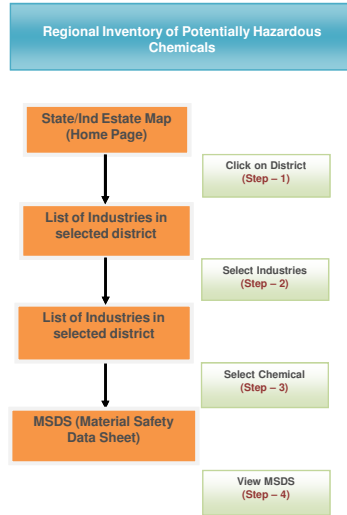
# Multiple sources



# Multiple sources



## Step 1: Inventory of Chemicals in Estate: a proposal to initiate



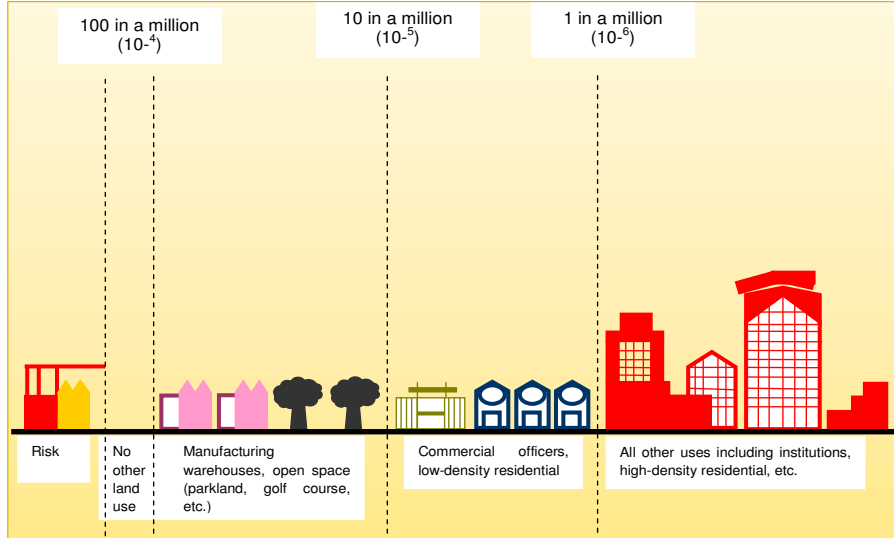
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**Regional Register for Potentially Toxic Chemicals**  
For Punjab Pollution Control Board

**MSDS (Material Safety Data Sheet) for Ethyl Alcohol**

GENERAL CHEMICAL DATA			
Chemical Name	Ethyl Alcohol	Chemical Classification	Alcohol
Synonyms	Alcohol ethylic, ethyl spirit, 95% grain alcohol, 100% neutral spirits, 100% grain alcohol	Trade name	Ethyl Alcohol, Ethanol
Formula	C <sub>2</sub> H <sub>5</sub> OH	C.A.S. No.	64-17-5
Molecular Weight	46.07	UN No.	1170
Relative Density	0.789	UN Subst. No.	1170
Specific Gravity	0.789	UN Hazard Class	3
Boiling Point	78.3°C	UN Hazard Label	Flammable Liquid 3
Melting Point	-114.1°C	UN Hazard Label	Flammable Liquid 3
Flash Point	12.8°C	UN Hazard Label	Flammable Liquid 3
Auto-ignition Temp.	423°C	UN Hazard Label	Flammable Liquid 3
Decomposition Temp.	245°C	UN Hazard Label	Flammable Liquid 3
Stability	Stable	UN Hazard Label	Flammable Liquid 3
Reactivity	Non-reactive	UN Hazard Label	Flammable Liquid 3
Corrosivity	Non-corrosive	UN Hazard Label	Flammable Liquid 3
Environmental Persistence	Highly persistent	UN Hazard Label	Flammable Liquid 3
Biodegradability	Highly biodegradable	UN Hazard Label	Flammable Liquid 3
Ecotoxicity	Highly toxic	UN Hazard Label	Flammable Liquid 3
Human Toxicity	Highly toxic	UN Hazard Label	Flammable Liquid 3
First Aid Measures	See MSDS	UN Hazard Label	Flammable Liquid 3
Fire Fighting	See MSDS	UN Hazard Label	Flammable Liquid 3
Accidental Release	See MSDS	UN Hazard Label	Flammable Liquid 3
Transport	See MSDS	UN Hazard Label	Flammable Liquid 3
Storage	See MSDS	UN Hazard Label	Flammable Liquid 3
Disposal	See MSDS	UN Hazard Label	Flammable Liquid 3
Regulatory Information	See MSDS	UN Hazard Label	Flammable Liquid 3

**Step 2: Land use control by notifying risk criteria (by amendment in MSIHC/CAEPPR rules) with respect to .....**



**Step 3: Shifting of the facilities in safe zones**





**Shifting of bulk storage/creation of bulk storage units to reduce MAH numbers**



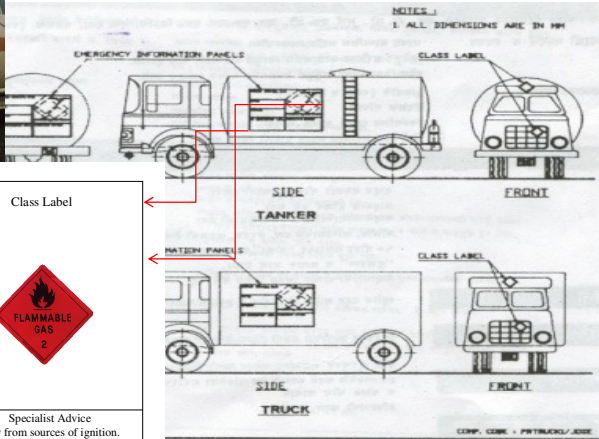
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**Step 4: Bulk Storages as industry: transportation of chemicals to the required industry to reduce the MAH units in Industrial estate/sez**



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## Step 5: Transportation by ensuring CMVR 1989 enforcement



Correct Technical Name Liquefied Petroleum Gas	Class Label
UN No. 1075	
Hazchem 2WE	
In Emergency Dial 100	Specialist Advice Keep away from sources of ignition.

## Step 6: Review of Security arrangements



**Plug the holes**



**1. Medical care: Ambulance and First Aid facilities**



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**First Aid: - Proper training facilities  
- MOU with multispeciality hospitals with  
IF/SEZ**



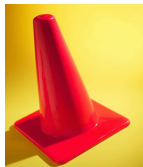
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## 2. Fire Fighting: New generation of fire fighting



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## 3. Preparedness in general



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## Awareness creation: signage at strategic location



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## 4. Emergency Operation Centre



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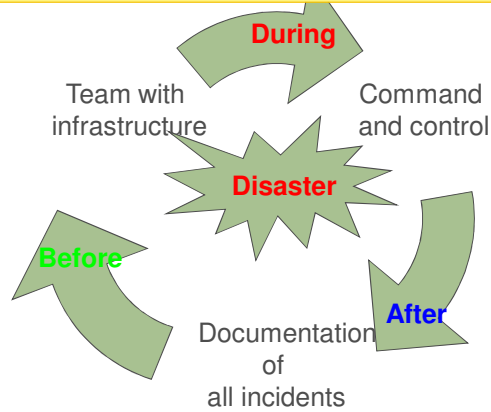
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2013





## Emergency Operation Centre

Goal: Develop a command and control capability that can be activated after a disaster to sustain the critical functions of the Industrial estate/SEZ



## 5. Drill/Training- Snap Shot Of Completed Training



Live Practical Fire Fighting



Table Top Exercises



## Suggested Emergency Plan Architecture



### Actual Situation:

- Description of mains activities/ situation of the company
- Location of the sites...

Logkeepers form

- Description of the team
- Organization chart
- Alert process
- Roles description

Actual architecture

Organization

General infos

Phone list

Forms

Operational part

- Crisis management Team contacts
- Mains contact in the head Quarter/ or Paris.
- Head office main contacts
- Sites main contacts
- Local contact for the site
- Country main contact ( administrativ/ Medical/ medias/ Legal / Advisors...

- Definitions / Level of crisis for the Plan...
- Specifics information for the Plan:
  - \_ layouts
  - \_ Equipment inventory
  - \_ Scenarios...
- Detailed Specific roles and actions dedicated to the Plan.

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