Roles of owners / managers and employees of hazardous activities arising from the legislation

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Main items of presentation:

I. Introduction

II. OECD / Chemical Safety / Chemical Accidents

III. Roles of owners / managers and employees of hazardous activities

I. Introduction

~ 1990:

> 8 million chemicals (used ~ 70 000)

1999:

> 20 million chemicals

nowadays:

> 35 million chemicals (used > 100 000)

leakages of the chemicals to the environment affect health of some 5 billion people

<u>dangerous property of chemicals</u>:
explosive, oxidising, flammable, toxic, harmful, irritant, corrosive, sensible, carcinogen, mutagen, toxic for reproduction, dangerous for the environment

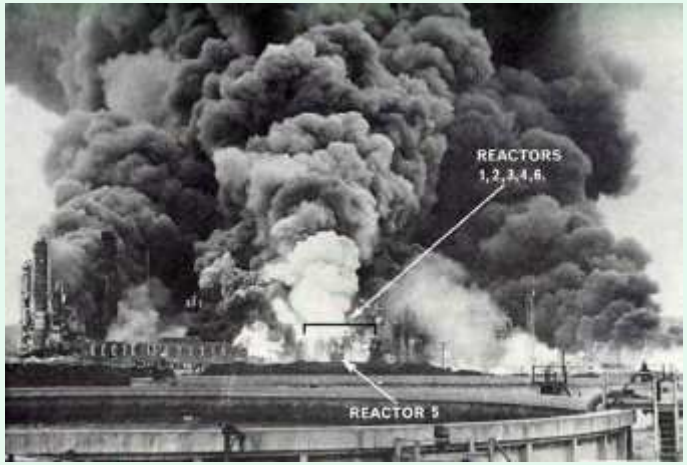
<u>main hazards</u>:
explosion, fire, toxic impact

<u>unwanted events</u>:
failure, near miss, incident, accident, major accident, disaster/catastrophe

Some major accidents …

Flixborough, UK, 1 June 1974

photos:
<http://yosemite.epa.gov/R10/CLEANUP.NSF/0/3d26b3bd998b77208825704d006ec092/$FILE/CEPP+Newsletter+May+June+2008+-+Fines,+PastLessons,PSM+&+RMP+Regs.pdf>



- **Process: Liquid phase oxidation of hydrocarbon**
- **Event: Massive explosion → fires**
- **Fatalities: 28**
- **Injuries: 36**
- **Damages: 412 million $**
- **Critical event: loss of containment of about 30000 kg hydrocarbon**
- **Official report: direct failure of the reactor by-pass**

Seveso, Italy, 10 June 1976

photos:
< http://www.flanet.org/download/publications/idossier/sevesouk.pdf>

Process: Batch chemistry

Event: Toxic release

Fatalities: none

Others: contaminad area 6 x 1 km;
37 000 exposed people;
736 evacuations > 6 months;
2000 people treatment;
a number of abortions;
4 % animal death; 80 000 animal prevention deaths

Critical event: loss of containment of reaction mass including about 2 kg TCDD (2,3,7,8-tetrachlorodibenzo-p-dioxin)

Theory: venting to atmosphere of a runaway reaction initiated by steam heating

Bhopal, India, 2/3 December 1984

photos:
< http://www.bhopal.org/whathappened.html >

Process: Pesticide production

Event: Toxic release

Fatalities: 1754 immediate, 2000 delayed

Injuries: 20 000 hospitalised; 50 000 minor injuries; 11 000 invalid

Critical event: loss of containment of 40 000 kg methylisocyanate (MIC)

Theory: pressure relief of storage tank after a water-initiated runaway reaction caused by: Sabotage? Water washing? Other?

Toulose, Francie, 21 September 2001

photos:
< http://www.buncefieldinvestigation.gov.uk/reports/comahreport3.pdf;
http://www.adpc.net/casita/Case_studies/Technological%20hazard%20and%20risk%20assessment/AZF_CASE_STUDY_REPORT_v2.doc >

Process: Fertilize production

Event: Massive explosion

Fatalities: 29

Injuries: 2442

Others: 500 house destructions

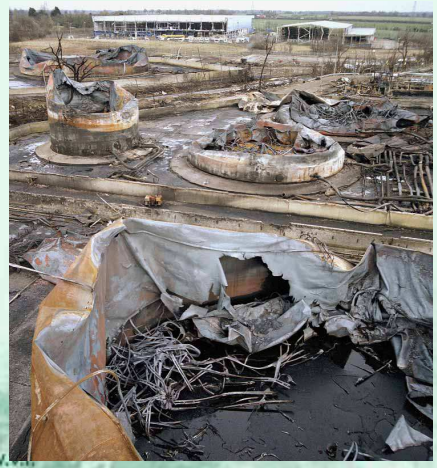
Damage: ? millions $

Critical event: ?

Theory: Sabotage?

Buncefield, UK, 11 December 2005

photos:
< http://www.buncefieldinvestigation.gov.uk/reports/comahreport3.pdf;
http://www.buncefieldinvestigation.gov.uk/reports/buncefieldagr.pdf >



Process: Oil storage and transfer depot

Event: Explosions and fires

Fatalities: none

Injuries: 43

Damage: millions of pounds

Critical event: Protection system to prevent overfilling of the tank did not operate

Incident: Railway station Káranice, Czech Republic, 9 Februar 2007

photos: < © Pavel Uher: http://www.vlaky.net/servis/galeria.asp?lang=1&page=1&id=2023&sort=1>

<u>Possibility of the major accident</u>:

Accident of the fast train with the goods train, fortunately rail ammonia tank was without ammonia release

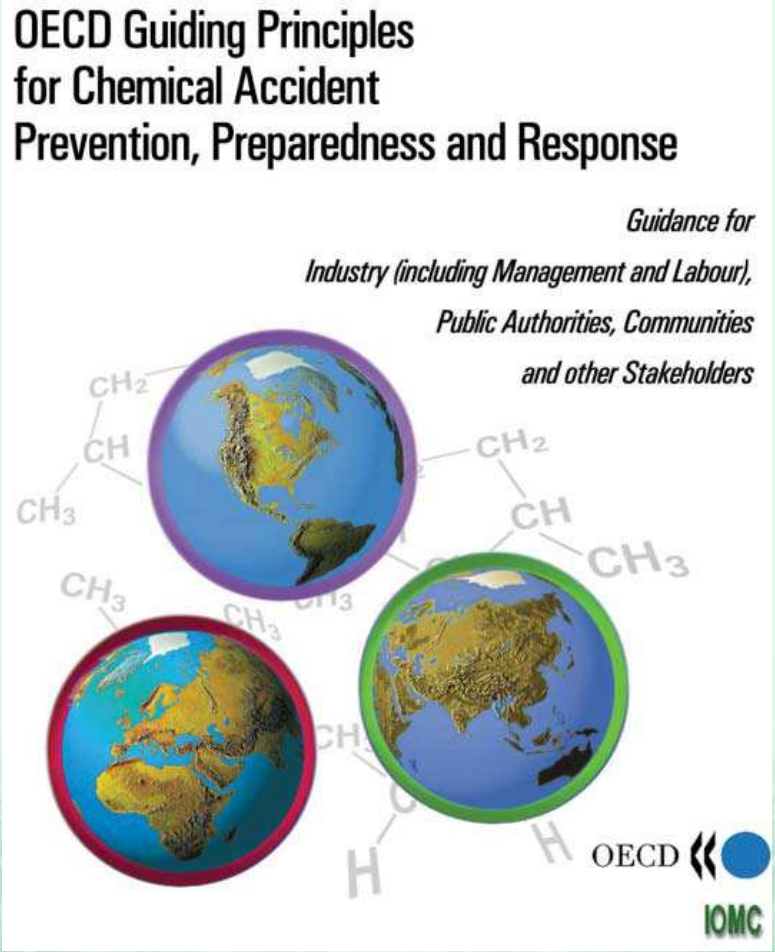
In case of an ammonia release:

? people fatalities

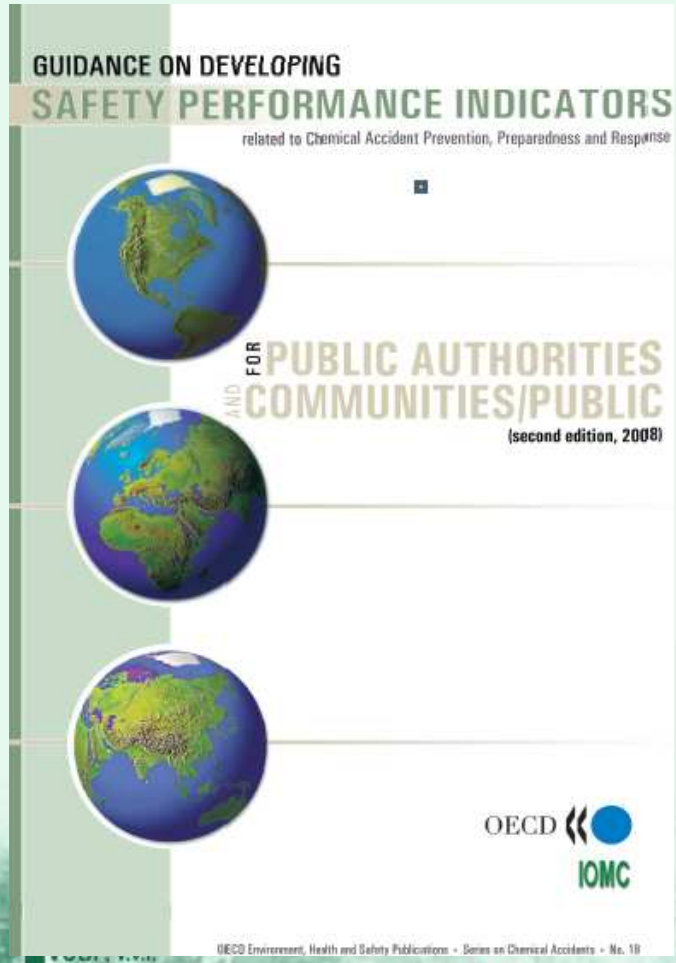
Financial damage:

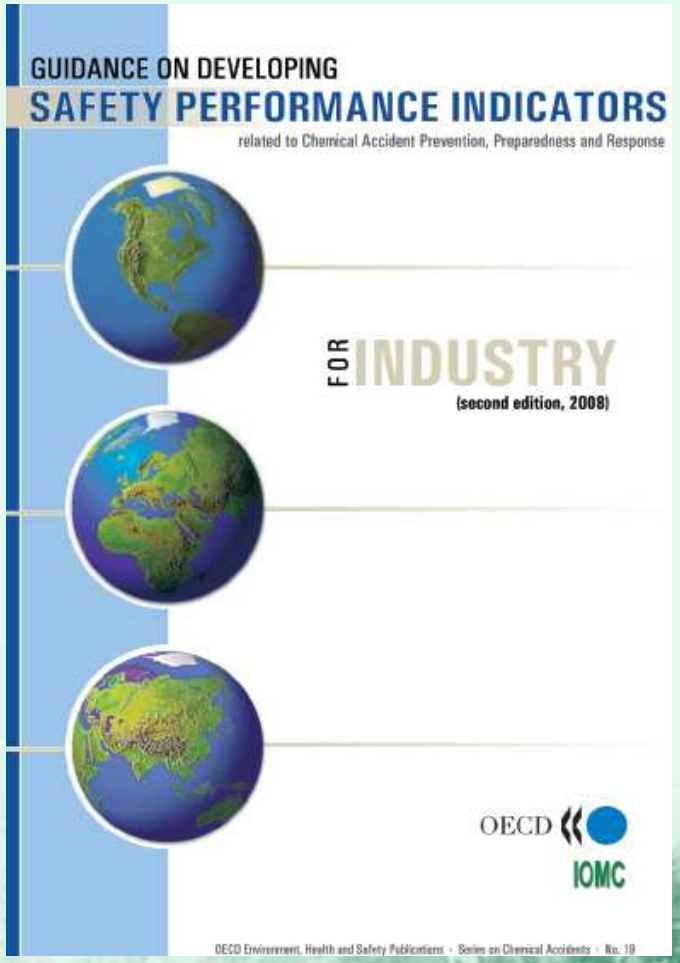
- **1974: Flixborough, Great Britain - 412 million $**
- **1984: Mexico City, Mexico: 31 million $**
- **1984: Bhopal, India: 470 million $**
- **2000: Baia Mare, Romania: 250 million $**
- **2000: Enschede, the Netherlands: 530 million $**
- **2001: Toulose, France: ? millions $**
- **2001: Brazil, oil platform in Atlantic ocean: 500 million $**
- **2001: New York, USA, terrorism: 30 – 70 billion $**
- **2005: Buncefield, UK: millions $**

II. OECD / Chemical Safety / Chemical Accidents



OECD / Chemical Safety / Chemical Accidents





The main tasks („Golden Rules“) are denoted in the „OECD Guiding Principles for Chemical Accident Prevention, Preparedness and Response. Guidance for Industry (including Management and Labour), Public Authorities, Communities and other Stakeholders“, which we may duly enlist in the following way:

TASK OF ALL INTERESTED SUBJECTS

- **Make chemical risk reduction and accident prevention, effective emergency preparedness and response, priorities in order to protect health, the environment and property**
- **Communicate and co-operate with other stakeholders on all aspects of accident prevention, preparedness and response**

INDUSTRY / *Management*

- **Know the hazards and risks at installations where there are hazardous substances**
- **Promote a „safety culture" that is known and accepted throughout the enterprise**
- **Establish safety management systems and monitor/review their implementation**
- **Utilise „inherently safer technology" principles in designing and operating hazardous installations**
- **Be especially diligent in managing change**
- **Prepare for any accidents that might occur**
- **Assist others to carry out their respective roles and responsibilities**
- **Seek continuous improvement**

INDUSTRY / *Labour*

- **Act in accordance with the enterprise´s safety culture, safety procedures, and training**
- **Make every effort to be informed, and to provide information and feedback to management**
- **Be proactive in helping to inform and educate your community**

PUBLIC AUTHORITIES

- **Seek to develop, enforce and continuously improve policies, regulations, and practices**
- **Provide leadership to motivate all stakeholders to fulfil their roles and responsibilities**
- **Monitor the industry to help ensure that risks are properly addressed**
- **Help ensure that there is effective communication and co-operation among stakeholders**
- **Promote inter-agency co-ordination**
- **Know the risks within your sphere of responsibility, and plan appropriately**

- **Mitigate the effects of accidents through appropriate response measures**
- **Establish appropriate and coherent land-use planning policies and arrangements**

ROLE OF OTHER STAKEHOLDERS (e.g., communities/public)

- **Be aware of the risks in your community and know what to do in the event of an accident**
- **Participe in decision-making relating to hazardous installations**
- **Co-operate with local authorities, and industry, in emergency planning and response**

III. Roles of owners / managers and employees of hazardous activities

Hazardous chemical substances + chemical preparations have one or more hazardous properties ➡ Hazard
Realization this hazard (e.g. explosion, fire, toxic impact) has consequences and impacts to its surroundings

⬇

Hazardous chemical substances + chemical preparations are sources of risk for people, livestock and environment

⬇

Risk is generally the likelihood of undesirable specific effect occuring within a specified period or in specified circumstances

Example dangerous chemical substances:

Explosive: ammonium nitrate

Oxidizing: oxygen

Extremely flammable: LPG (liquifed petroleum gases)

Higly flammable: petrol

Flammable: paint thinner

Very toxic: methylisocyanate

Toxic: chlorine, ammonia

Dangerous for the environment: oil products

Harmful: toluene

Corrosive: sulfuric acid

Irritant: hydrochloric acid

Sensibilising: formaldehyde

Carcinogenic: benzene

Mutagenic: benzopyrene

Toxic for reproduction: lead alkyl

Roles of owners / managers and employees of hazardous activities of hazardous activities after 59/2006 Coll. Act (Major Accident Prevention Act

Legal person / trading natural person:

- **Prepare „list“ (type, amount, classification and physical form of all dangerous substances located in the establishment or installation)**
- **Adopt all essential measures to prevent major accidents and limit their consequences for the health and life of people, livestock, the environment and property**
- **Propose the classification of the establishment or installation in group A (low-tier) or group B (up-tier) (or make „non-classification protocol“)**

(regional authority will issue a decision)

Content of „Proposal for classification“:

- **Identification data of the establishment or installation and authorised natural person**
- **List**
- **Description of current or planned activity**
- **Information about surroundings**
- **Information about calculation in the classification proposal**
- **Signature authorised person**

- **Perform risk analysis and risk assessment of a major accident**
- **Prepare safety dococument „Safety programme for prevention of major accident“ (group A)**
- **Prepare safety document „Safety report“ (group B)**
- **Agree insurance against liability for damage resulting from major accident**
- **Prepare plan for physical protection of establishment or installation**
- **Evaluate changes in the establishment or installation regard to classification and updating of the safety documentation**

- **Prepare internal emergency plan in cooperation with employees of an establishment or installation (group B), … to demonstrably acquaint employees and other natural persons in the establishment or at the installation, including workers of long-term subcontractors, of the risks of a major accident, of preventive safety measures and of desirable behaviour in the case of the incidence of a major accident…**
- **Prepare and submit to the regional authority written information for the designation of an emergency planning zone and processing of an external emergency plan and to cooperate on the ensuring of accident readiness in the area (group B)**

- **Information in the case of accident: an operator who causes a major accident shall be obliged to immediately notify the competent Regional Authority, other affected bodies of the state administration, and affected municipalities of the major accident**

…hands of man from Bhopal…

- **chemistry is not enemy**
- **enemy is lack of knowledge and humility**
- **we all are „human factor“ in this world – anybody, anywhere, in any time**

THANK YOU

FOR YOUR ATTENTION