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

main hazards: explosion, fire, toxic impact

unwanted events: failure, near miss, incident, accident, major accident, disaster/catastrophe
Some major accidents …
Flixborough, UK, 1 June 1974

photos:

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

Process: Batch chemistry
Event: Toxic release
Fatalities: none

Others: contaminated 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

photos:
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?
Toulouse, Francie, 21 September 2001

photos:

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:

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 February 2007

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

Possibility of the major accident:
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: 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 Guiding Principles for Chemical Accident Prevention, Preparedness and Response

Guidance for Industry (including Management and Labour), Public Authorities, Communities and other Stakeholders
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

Participate 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 occurring within a specified period or in specified circumstances
Example dangerous chemical substances:

Explosive: ammonium nitrate
Oxidizing: oxygen
Extremely flammable: LPG (liquifed petroleum gases)
Highly 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 document „**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