Activities at EU level on the control of major-accident hazards arising from pipelines conveying dangerous substances

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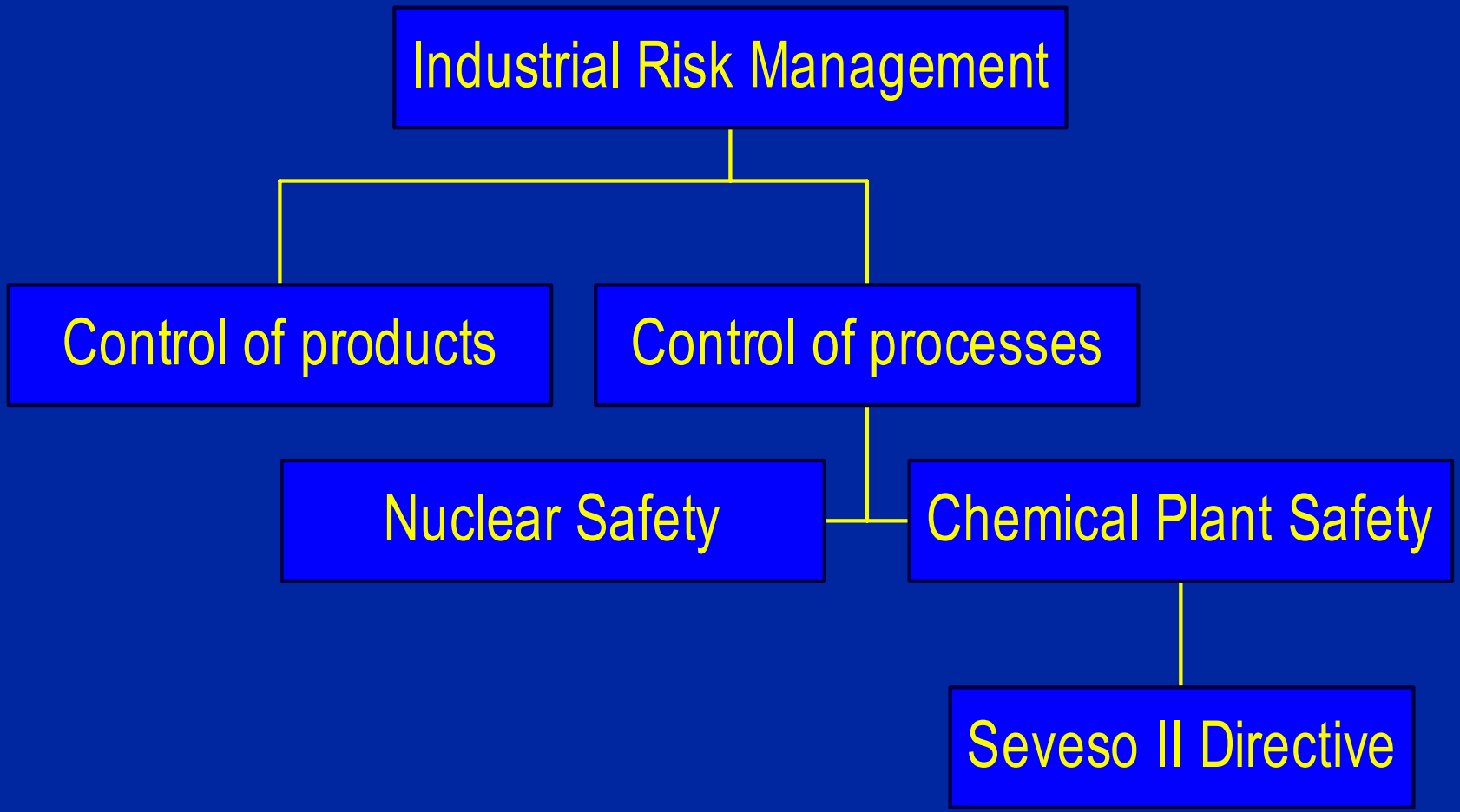
Overview


Industrial Risk Management
Control of products
Control of processes
Nuclear Safety
Chemical Plant Safety
Seveso II Directive

Safety Management Systems

- Under the original Seveso Directive (1984-1999), approximately 350 ‘major accidents’ have been reported to the European Commission.
- Failure of the ‘management system’ contributed to a high percentage of these accidents.
- Therefore, one of the ‘core requirements’ of the European Seveso II Directive (96/82/EC) is the obligation on operators to have a *Safety Management System*.

Pipelines

- **are excluded from Seveso II (Article 4 (d))**
- **However, it is recognized that *the transmission of dangerous substances through pipelines also has a potential to produce major accidents (Recital 13).***
- **Both, Council and the European Parliament requested the Commission**
  - ***A: to collect and evaluate information about existing mechanisms within the Community for regulating such activities***
  - ***B: to collect and evaluate information about the occurrence of relevant incidents***

Pipeline networks in the European Union (EU)

- **Natural Gas**
  - transmission & gathering lines (developing fast): ~180,000 km in 1996
  - distribution lines: 1 million km
  - consumption: 300 billion m^3 in 1996, 530 billion m^3 in 2020
- **Oil**
  - Onshore crude oil - oil products: ~ 30,000 km (mainly F, D, I, UK, NL, ES)
- **Other dangerous substances**
  - e.g ethylene, propylene, chlorine, ammonia: ~10,000 km

A - review of existing national legislation

The review consisted of the following elements:

- **A.1: Questionnaire exercise (1996-97)**
- **A.2: OECD Workshop on Pipelines (Oslo, June 1996)**
- **A.3: EC Workshop on Pipelines (Berlin, October 1997)**
- **A.4: "Regulatory Benchmark" (1998-99)**

A.1: Questionnaire exercise (1996-97)

"The exercise showed that there is large variation across the Member States in the extent of existing legislation on pipelines, ranging from well-developed systems in some countries to little or nothing in others. In general, the *major-accident hazard* aspects of pipelines are not fully covered by many Member States when compared with other major-accident hazards such as chemical installations."

A.2: OECD Workshop on Pipelines (Oslo, June 1996)

The workshop produced 42 conclusions and 13 recommendations, including the following:

- **Guidance such as the OECD Guiding Principles for Chemical Accident Prevention, Preparedness and Response should be applied to pipelines.**
- **Safety Management Systems should be applied to pipelines.**
- **Measures should be developed to avoid *third-party interference*, e.g. 'one-call' systems.**
- **Improvements should be made in collecting and sharing information on accidents and incidents.**

A.3: EC Workshop on Pipelines (Berlin, October 1997)

"The workshop concluded that, with respect to 'filling gaps' in the existing legal situation in the EU Member States on pipeline safety, a mandatory goal-orientated instrument was the most appropriate solution. A broad majority of delegates expressed a preference for an instrument containing as a central requirement a '*Safety Management System*', together with agreed performance measures."

A.4: "Regulatory Benchmark" (RB) (1998-99)

Results of a self-assessment by EU Member States, comparing their existing legislation against the RB:

- **types of substances covered are not extensive**
- **important preventive measures, e.g. *prevention of third-party damage* are not always covered**
- **there is not always a requirement for a '*Safety Management System*'**
- **measures to limit the consequences of accidents, such as *emergency planning, information to the public, land-use planning* are not always covered**
- **there is no formal comprehensive collection of reports on major pipeline accidents**

B - review of pipeline accidents/incidents (1)

- No formal reporting requirements at European level make data collection difficult!
- Existing data shows that pipeline accidents, while less frequent than those of 'Seveso' establishments, are at least as serious in their consequences.
- A closer analysis of major pipeline accidents shows that environmental damage is mostly related to oil spills, whereas health damage is mostly related to gas releases.

B – review of pipeline accidents/incidents (2)

The main causes of accidents/incidents are:

- external interference or third party activity
- corrosion
- construction defect and mechanical or material failure
- ground movement or natural hazards in general
- operational error or hot-tap by error
- other or unknown causes

Some conclusions (1)

- There is a large variation in the control of pipelines in the EU Member States and there are important gaps in national legislation.

- The initial results of the Questionnaire exercise carried out in 1996-97 have been largely confirmed by the much more comprehensive analysis performed through the Regulatory Benchmark in 1998-99.

Some conclusions (2)

- The review of pipeline accidents has shown that the existence of 'pipelines legislation' in other industrialised parts of the world, such as the United States, contributes to better knowledge about major accidents and their consequences.
- However, even with the limited information sources available for Europe, it can be demonstrated that there is a major-accident potential for pipelines, also taking into account the fact that European pipeline networks are growing rapidly and existing networks are ageing.

Some conclusions (3)

- As a general principle governing environmental policy, the precautionary principle should be respected, i.e. to take precautionary measures rather than to react only after an accident has happened.

- External Study Cost-benefit analysis (1998) "There is good reason to assume that improvements in the management of pipelines with respect to major accidents would yield a cost reduction in the order of at least 20%."

Follow-up

- **Sixth Environmental Action Programme (EAP)**

  "developing further measures to help prevent the major accident hazards with special regards to those arising from pipelines"

- **Commission Decision of 11 June 2003 setting up a group of experts to advise the Commission on a strategy for dealing with accidents in the transport sector (2003/425/EC)**

Independent Group of Experts on accidents in the transport sector

- 12 members, two-year renewable mandate
- advises the Commission on a strategy for dealing with accidents in the transport sector, in particular on the need to propose new legislation or other initiatives
- mandate covers all modes of transport, including the transport of energy (oil and gas pipelines)

Pipeline Working (Sub-) Group, Objectives

- initially focus on main oil and gas transportation pipelines
  - oil lines 6 inch and >40km
  - gas pressure >16 bar
- overview related studies and reports including statistics
- update the overview of 2001 benchmark from the Seveso II Directive for EU-15
- penetrating the new EU-10 member states
- observation there is no lack of quality standards or specifications (e.g. European Standards CEN 1594 Design/Construction/Operation and CEN/TC 234 Pipeline Integrity Management)

Pipeline Working (Sub-) Group, Focus next period

- Complete draft report
- update benchmark legislation framework for EU25
- update with European standards (CEN/EN's)
- define recommendations to deal with threats
- Independent Investigation on pipelines
- define status of report (EU guideline, recommended practice, or standard)

Pipeline Working Group, Contact person in DG TREN

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Research Activities

Examples:

- **Colli/Kirchsteiger Report: Analysis of Reported Risk Figures for Natural Gas Transmission Pipelines (EUR 21308 EN, August 2004)**
- **EU-Russia-NIS Workshop on Vulnerabilities and Integrated Diagnostic Systems for Trunk Pipelines: Regional Aspects, 6-8 October 2004, Ispra (IT)**
- **Assessment of interest to create a technical network (EU-CIS countries together) on the security and reliability of pipeline infrastructures**

Recent Security Activities

- **Joint Workshop on the protection of hazardous installations from intentional adversary acts, Budapest 28-29 April 2005: Conclusions**
  - Security measures should be addressed horizontally and be dealt with in a multidisciplinary way
  - Security provisions can be complementary to safety requirements.
  - Advantage to have unique emergency plans
- **The EU Critical Infrastructure Protection Seminar 6-7 June 2005**
  - **Workshop 6 Energy and Transport security**

Final remarks (1)

- Transport of dangerous substances through pipeline networks clearly has a European rather than a national dimension. Therefore, action at EU level seems appropriate.
- The EP and Council Decision on the 6EAP leaves the nature of the "measures" to be taken open:
  - binding legislation or
  - non-binding recommendations
- Non-binding recommendations for pipeline safety already exist at OECD level ("Guiding Principles for Chemical Accident Prevention, Preparedness and Response", 2nd edition, 2003).

Final remarks (2)

- Some approaches in the Seveso II Directive could be used as a model for pipelines (safety management system, accident reporting requirements, information to the public, emergency planning).

- A ‘goal-oriented approach’ would be best designed to fill gaps in existing legislation.

- The Group of Experts will advise the Commission on the strategy, in particular on the need to propose new legislation or other initiatives.