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# Dangers arising from hazardous activities and transportation of hazardous substances

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## Agenda

- Industrial plants that may cause a major accident,
- Transportation of dangerous materials,
- Causes of accidents,
- Competent authorities to deal with major accidents,
- Conclusions

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## Identification of the sources of major accidents

- Industrial plants – industrial processes and storage
  - Transportation of dangerous substances
- Events with the features of major accidents in 2008
- INDUSTRIAL PLANTS
  - TRANSPORT
  - OTHER

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## Upper-tier establishments (UTE) and lower-tier establishments (LTE)

- Regulation of the Minister of Economy on the kinds and quantities of dangerous substances the presence of which in an industrial plant decides on its rating as a lower- or upper-tier establishment (implementation of Annex I to the Seveso II Directive),
- Annex I to the UNECE Convention on transboundary effects of industrial accidents – unified with the Seveso II Directive (except for bromine, methanol and oxygen).

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## Classification criteria

- Inventory of dangerous substances designated by name with the specification of threshold quantities,
  - Inventory of the categories of dangerous substances with the threshold quantities,
  - Description of the classification procedure
- Analysis of the location of establishments regarding:
- Distance of 15 km from the border (air pollution),
  - Two-day water flow – according to the recommendations of UNECE (water pollution)

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## Dangerous establishments

- The national register of dangerous establishments comprises 1173 entries, where: UTE – 161, LTE – 195, Other – 817 (information on UTEs and LTEs reported to the European Commission)
- In the cross-border zone (Germany): 11 (information reported to UNECE and the German side, as per separate arrangements)

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## Other establishments

The category of other establishments includes those industrial plants that keep:

- smaller quantities of dangerous substances than specified in Table 1, Column 4 and Table 2, Column 2 of the annex to the Regulation of the Minister of Economy of 9 April 2002 on the kinds and quantities of dangerous substances the presence of which in an industrial plant decides on its rating as a lower- or upper-tier establishment,

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- more than 5 % of the quantity of dangerous substances, specified in Table 1, Column 5 and Table 2, Column 3 of the annex to the above-mentioned regulation of the Minister of Economy,
- less than 5% of the quantity of dangerous substances, specified in Table 1, Column 5 and Table 2, Column 3 of the annex to the above-mentioned regulation of the Minister of Economy, however an event that meets the criteria specified by the regulation of the Minister of Environment has occurred on the plant premises.

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### Profiles of the upper- and lower-tier establishments

Type of activity	UTE	LTE	UTE+ULE
Transportation, storage and distribution of natural gas and LPG	36 %	25 %	29 %
Refinery operations (including crude oil and liquefied fuel storage facilities)	27 %	22 %	21 %
Chemical operations (including pharmaceutical and production of process gases)	21 %	18 %	24 %
Supply of electrical power and heat, food industry, construction, cargo handling terminals, steelworks etc., pyrotechnics plants, supply and treatment of water	16 %	35 %	26 %

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### Examples of information about the establishments that may be the source of a major accident

- Exact location (address and coordinates),
- Population density within a radius of 5 km and 10 km,
- Number of employees,
- Distance from residential buildings,
- Distance from the nearest watercourse,
- Distance from protected areas,
- Distances from other plants (the domino effect),
- Kind, category and quantity of dangerous substances

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### Location of the establishments within the Polish-German border zone

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### Establishments within the Polish-German border zone

- There are 8 establishments within a distance of 15 km from the border
  - Two-day water flow: 3
- Dangerous substances:
- Toxic: ammonia, chlorine and methanol
  - Oil and derivatives (diesel/heavy oil, heating oil, petrol) ⇒ hydrophobic substances

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Industrial plants are potential stationary sources of major accidents, therefore statutory systems to prevent incidents of this kind have been developed.

Emergency scenarios with specific procedures followed in the event of an accident are important elements of the systems.

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Results of post accident analyses carried out in various establishments show that the smallest numbers of accidents occur in the plants classified as upper- and lower-tier establishments.

The establishments where the relevant EU procedures to prevent major industrial accidents have been introduced are covered by statutory supervision of the Inspectorate for Environmental Protection with inspections performed at a specific frequency: UTE: once per year, LTE: once per two years

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### **Transportation**

The following types of transportation can provide a source of major accidents:

- road transport,
- pipeline transport,
- rail transport,
- water transport.

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### **Transportation**

- Analysis of major accident hazards in the cross-border zones of the neighbouring countries: Belarus, Czech, Lithuania, Germany, Russia, Slovakia and Ukraine.
- It is not covered by the Seveso II Directive or the UNECE Convention (except for the mitigation of the consequences of major accidents resulted from transportation).

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### **Analysis of the risk of a major accident in the cross-border zones**

- Legal regulations concerning the transportation of dangerous substances,
- Characteristics of the border area
- Characteristics of the road transport system,
- Characteristics of the rail transport system,
- Characteristics of the pipeline system,
- Risk analysis (types of hazards, analysis of the influence of pollution/release of dangerous substances on the people and environment, designation of impact zones).

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### **Factors affecting the possibility and the extent of a major transportation accident**

- Density of dangerous goods traffic,
- Technical condition of the means of transport,
- Insufficient number of designated and marked routes for dangerous goods traffic,
- Non-compliance with international agreements concerning road and rail transportation of dangerous goods (ADR, RID),
- Insufficient monitoring of dangerous goods traffic,
- Inadequate equipment of the services obliged to mitigate the consequences of major transportation accidents

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### **Factors determining the extent of risk in the transportation of dangerous substances**

- Considerations resulting from the general transport risk and safety requirements in the context of environmental protection and land development,
- Considerations resulting from the existing network of roads and the density of traffic,
- Economical considerations of transportation and requirements of freight carriers as regards transport economy.

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- Hazards to people: compressed or liquefied gases under pressure
- Hazards to the environment: low-biodegradable petrochemical products (heating oil, diesel/heavy oil)

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### **Pipeline transportation within the Polish-German border zone**

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### **Pipeline**

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As far as transportation is concerned we usually deal with smaller quantities of substances than those kept in industrial plants, ranging from a few to several dozen tons.

The factor that hinders the ability to respond in the event of a major accident is the unpredictability of the place of occurrence.

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### **Causes of emergency incidents**

- bad technical condition of industrial plants;
- errors of the industrial plant operators;
- lack of proper handling of hazardous substances;
- bad technical condition or a lack of devices to protect the environment against release of hazardous substances;
- lack of proper supervision of the operated plants handling hazardous substances;
- power supply failures,

- attempted theft of fuel from transmission pipelines for petroleum products;
- damage to pressurised pipelines during construction and earthworks;
- bad technical condition of the roads;

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**Competent authorities to deal with major industrial accidents**

- Inspectorate for Environmental Protection
- State Fire Service
- Provincial governors, county administrators, mayors/borough leaders (provincial, county and district emergency management teams).

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**IEP activities as regards major accident prevention and recovery**

Creation of provisions for the prevention of major accidents, mitigation of consequences and recovery of the affected environment.

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**IEP authorities implement the above-mentioned objectives through:**

- identification of entities processing or handling dangerous substances,
- registration of possible originators of major accidents,
- inspections related to the hazards of major accidents,
- cooperation in rescue operations carried out by competent authorities and services and supervision of the recovery operations,
- registration of major accidents,
- evaluation and analysis of the causes of major accidents and determination of the application of the results in preventive measures,
- training and instruction of public administration authorities and economic entities,
- cooperation with public administration authorities in the prevention of major accidents

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**IEP Standard Operating Procedures in Major Accidents**

Accidents not requiring rescue operations (pollution of surface waters with water-soluble substances, released in the form of emulsion or suspension).

- Determination of the cause and kind of pollution,
- Determination of the originator and adoption of measures to eliminate the cause of pollution,
- If the originator's activity results in the deterioration of the environment or poses a threat to human health or life the relevant PIEP issues a decision to suspend the activity, Immediate notification of the pollution of surface waters to the competent authorities.

Accidents requiring rescue operations (pollution of surface waters, groundwater and soil with hydrophobic substances whose thickness is lower than the thickness of the water, mainly oil-derivative substances).

- Cooperation with the rescue operations manager, providing advice as to the scope of necessary actions,
- współpraca z organami wojewody i starosty

Supervision of the recovery operation

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**Conclusions**

- Major accidents may also occur in the establishments that handle or store smaller quantities of dangerous substances (not covered by the Seveso II Directive or the UNECE Convention)
- A comprehensive identification of threats and hazards facilitates proper responding to emergencies,

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- The most frequent cause of accidents was the emission of hydrocarbons from crude oil and its processing,

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An analysis of the incidents that happened so far proves that the major accident prevention system implemented in Poland is an efficient system, supported by:

- the preparedness of response teams,
- cooperation with chemical and environmental rescue units of the State Fire Service and other emergency services.

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- The exchange of information between neighbouring countries as regards possible threats in the cross-border zones is a key element of bilateral cooperation

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**Thank you for your attention.**