

*UNECE Convention on Transboundary Effects of Industrial
Accidents*

Training on identification of hazardous activities

6-7 December 2011, Tashkent

The Serbian approach to the identification of hazardous activities under the Convention

Convention on the Transboundary Effects of Industrial Accidents

Identification of hazardous activities

From Article 4. of the Convention
„Identification, Consultation and Advice“

*For the **purpose of undertaking preventive measures** and setting up **preparedness measures**, the Party of origin shall take measures, as appropriate, to **identify hazardous activities** within its jurisdiction and to **ensure that affected Parties are notified** of any such proposed or existing activity.*

SERBIAN LEGISLATION

- Law on Ratification of the Convention on transboundary effects of industrial accidents (Official Gazette RS No. 42/09)
- Law on Environmental Protection (Official Gazette RS No. 135/04, 36/09)
- Law on Chemicals (Official Gazette RS No. 36/09)

By-laws on chemical accident prevention and chemicals management

- Rulebook on the list of dangerous substances and their quantities → harmonized with Annex I
- Rulebook on the content of Notification
- Rulebook on the content and methodology for elaboration of Major-accident prevention policy, Safety report and Internal emergency plan
- Rulebook on the classification, packing, labeling and advertising of chemical and certain product
- Rulebook on classification, packing, labeling and advertising of chemical and certain product in accordance with GHS of classification and labeling of the UN

System for identification of hazardous activities

RESPONSIBILITIES

METHODOLOGY



**IDENTIFICATION
PROCESS**

System for identification of hazardous activities

OBJECTIVES



- **Elaborating and validating a list with hazardous activities according the Convention's requirements; and**
- **Ensuring that it functions over time independently from staff changes within the responsible authority/ies.**

Mechanisms within the system

- First: A mechanism for the collection of data;
- Second: A mechanism for the analysis and validation of data;
- Third: A mechanism for the review/revision of data.

First step-collecting of data

- **Collecting information on all substances at the site**
- **Including all installations in the establishment**
 - **Storage facilities**
 - **Production facilities**
 - **Loading and distributing facilities**
- **Including all chemicals in the establishment**
 - **Raw materials**
 - **Intermediates**
 - **Byproducts**
 - **Finished products**
 - **Substances built during chemical reactions or by an accident**

First step-collecting of data

The type of data to be collected

The operator of the hazardous activity submit to the Ministry Notification with data about establishment and data on hazardous substances (*the name and classification of the substances*) they use/storage/ handle and their *quantities*.

The type of data to be collected

Data are collected for all installations where hazardous substances are present in quantities equal to or greater than thresholds listed in the **List of dangerous substances** (The Rulebook on the list of dangerous substances and their quantities) - **compliant with Annex I of the Convention.**

The data format to be used by HA operators to present data to the competent authority/ies

Data are collected by fulfilling forms.

Operator of the hazardous activity is obliged to submit Notification (data format) to the Ministry.

Responsibilities

**Ministry of Environment,
Mining and Spatial Planning**

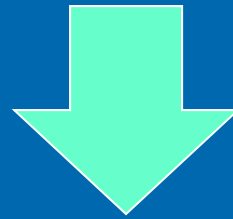
**Section for Chemical
Accidents Protection**

Environmental Inspection,
Department for chemical and
Seveso installation management

National level, authority which is responsible for collecting and processing data on hazardous activities is the Ministry of Environment, Mining and Spatial Planning (MEMSP)

The frequency of data collection

The timing for data collection is defined
(LEP)



Linkage with the validation, review/revision
of data

Second step-analysis and validation of data

The result of the data analysis should show whether data collected is complete, compliant with Annex I, adequate for the purpose of identifying hazardous activities and that it corresponds to the real situation.

Analysis and validation of data

- **Checking whether the establishment is in the Scope of the Convention**
- **Assessment whether the hazardous chemicals meet the criteria of Annex I**
- **Determination of the maximum amounts of the hazardous substances**
- **Determination of the consequences of a possible industrial accident and the probability of transboundary effects**

Checking whether the establishment is in the Scope of the Convention

From Article 2. of the Convention - **Exclusions**

- Nuclear accidents or radiological emergencies;
- Accidents at military installations;
- Dam failures, with the exception of the effects of industrial accidents caused by such failures;
- Land-based transport accidents with the exception of:
 - Emergency response to such accidents;
 - Transportation on the site of the hazardous activity;
- Accidental release of genetically modified organisms;
- Accidents caused by activities in the marine environment, including seabed exploration or exploitation;
- Spills of oil or other harmful substances at sea

Structure of Annex I of the Convention

Part I – Categories of substances and preparations not specifically named in Part II

- Based on generic toxicological, physical-chemical or ecotoxicological properties
- Characteristic endpoints – LD50, LC50, EC50, flashpoint, etc.

Part II – Named substances

- Substances of high concern /TDI, Methyl isocyanate, Phosgene, Chlorine/
- Widely used substances /Ammonium nitrate, LPG, Petroleum products/

Explanatory notes

Assessment whether the hazardous chemicals meet the criteria of Annex I

- ❑ Classification of chemicals according the physical, chemical and toxicological properties
- ❑ Determining the maximum amounts of the hazardous substances
- ❑ Making a list of dangerous substances and their quantities - compliant with Annex I

The classification of the substances and preparations at the site is a responsibility of the operator!

Classification of chemicals

- **EU classification system**
 - **CLP/GHS**
<http://esis.jrc.ec.europa.eu/index.php?PGM=cla>
- **GHS classification system**
 - **C & L Regulation**
 - **Downstream effects**
- **National classification systems**
- **Classification of mixtures**
- **UN/ADR Classification of the chemicals**
- **SDS (Safety Data Sheet)**

Classification of chemicals

➤ International Sources of information

- MSDS of the chemicals
 - ILO Database -
<http://www.ilo.org/public/english/protection/safework/cis/products/icsc/index.htm>
 - Other recognised sources
 - The JRC of the EU database CLP/GHS –
<http://esis.jrc.ec.europa.eu/index.php?PGM=cla>
- Based on Annex I of Directive 67/548/EEC
 - Gives Seveso classes -> connection to Annex I of the Convention
- ESIS database - The JRC of the EU database –
<http://esis.jrc.ec.europa.eu>
- Substances produced or marketed in the EU
 - For HPVC and/or substances of high concern – IUCLID dossier with relevant toxicological and physicochemical properties -
<http://ecb.jrc.it/esis/index.php?PGM=dat>
- National legislation for classification of hazardous chemicals
- ADR (GHS) Classification of the chemicals -
http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html
- Other sources
 - Toxicological properties scientific reports
 - Physicochemical properties scientific reports
 - Websites – Chemfinder, Chemindustry.com, etc.
 - Industry experience

Determining the maximum amounts of the hazardous substances

- For gaseous and liquid chemicals – the storage and production capacities
- For solid chemicals – the amount needed for full production capacity, including reserves

- **For categories of substances and preparations not specifically named in Part II of Annex I**
 - **Threshold quantities in Part I of Annex I**
 - **If multiple classifications – the lowest threshold**
 - **If in preparations**
 - **As long as the preparations possess the hazardous properties mentioned**
 - **Concentration limits**
 - **Generic concentrations**

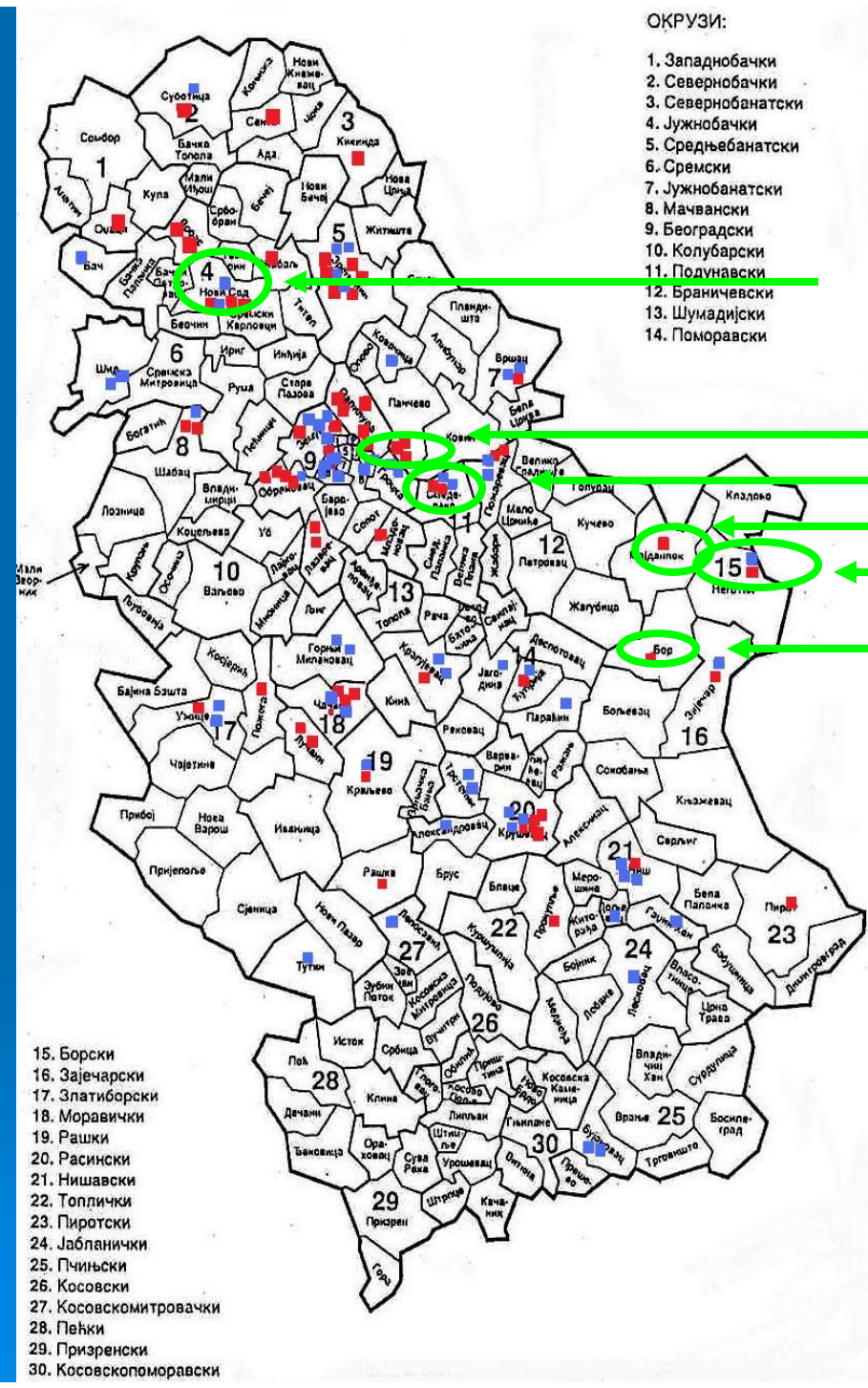
➤ For named substances

- **Threshold quantities in Part II of Annex I**
- **If in preparations**
 - **Recalculation to pure substances**
 - **As long as the preparations posses hazardous properties**

Analysis and validation of data

- **Applying the location criteria**
 - 15 km for air path
 - flowing period of two days of average flow velocity
- **Risk assessment, if needed (possible consequences and transboundary effects)**

Hazardous activities in Republic of Serbia



- Upper tier
- Lower tier
- Under the Convention

Preliminary list of hazardous activities under the Convention

	Hazardous activity	Geographical location	Type of activity
1	Chemical industry Prahovo	Prahovo	Production of mineral fertilizers
2	Copper Mines Bor	Bor	Tailing
3	Copper Mines Majdanpek	Majdanpek	Tailing
4	Oil Refinery Pancevo	Pancevo	Oil refinery
5	Fertilizer company	Pancevo	Production of mineral fertilizers, nitric compounds and ammonia
6	Petrochemical company	Pancevo	Polymers production
7	Oil refinery Novi Sad	Novi Sad	Oil refinery
8	NIS Petrol Jugopetrol – Installation Prahovo	Prahovo	Storage of petroleum products
9	NIS Petrol Jugopetrol – Installation Smederevo	Smederevo	Storage of petroleum products

Validation procedure

- **Provisional list of hazardous activities** → validation is needed
- **It is necessary to prescribe validation procedure**
- **Forming the Joint Expert Group for analysis, validation and review/revision of data (members from MEMSP, MoI, MAFW, MLSP, other institutions, experts)**

Applying the mechanism for data analysis

- Within the Project for Bulgaria, Romania and Serbia on joint management of transboundary emergencies from spills of hazardous substance into the Danube river, in-field exercise in Prahovo region was held
- Petroleum storage located at the bank of the Danube River in Prahovo, Serbia, was identified as a possible source for causing transboundary effects in the event of an accident
- In the scope of this Project, it was confirmed that hazardous activity identified within the Preliminary list of hazardous activities, may cause transboundary effects

Substance and quantity criteria

- Storage of petroleum products
- Tanks for gasoline and diesel fuel - meeting the criteria of Annex I

- **Part II – Named substances**

Petroleum products: gasolines and naphthas, kerosens (including jet fuels); gas oils (including diesel fuels, home heating oils and gas oil blending streams) – threshold 25 000 tones

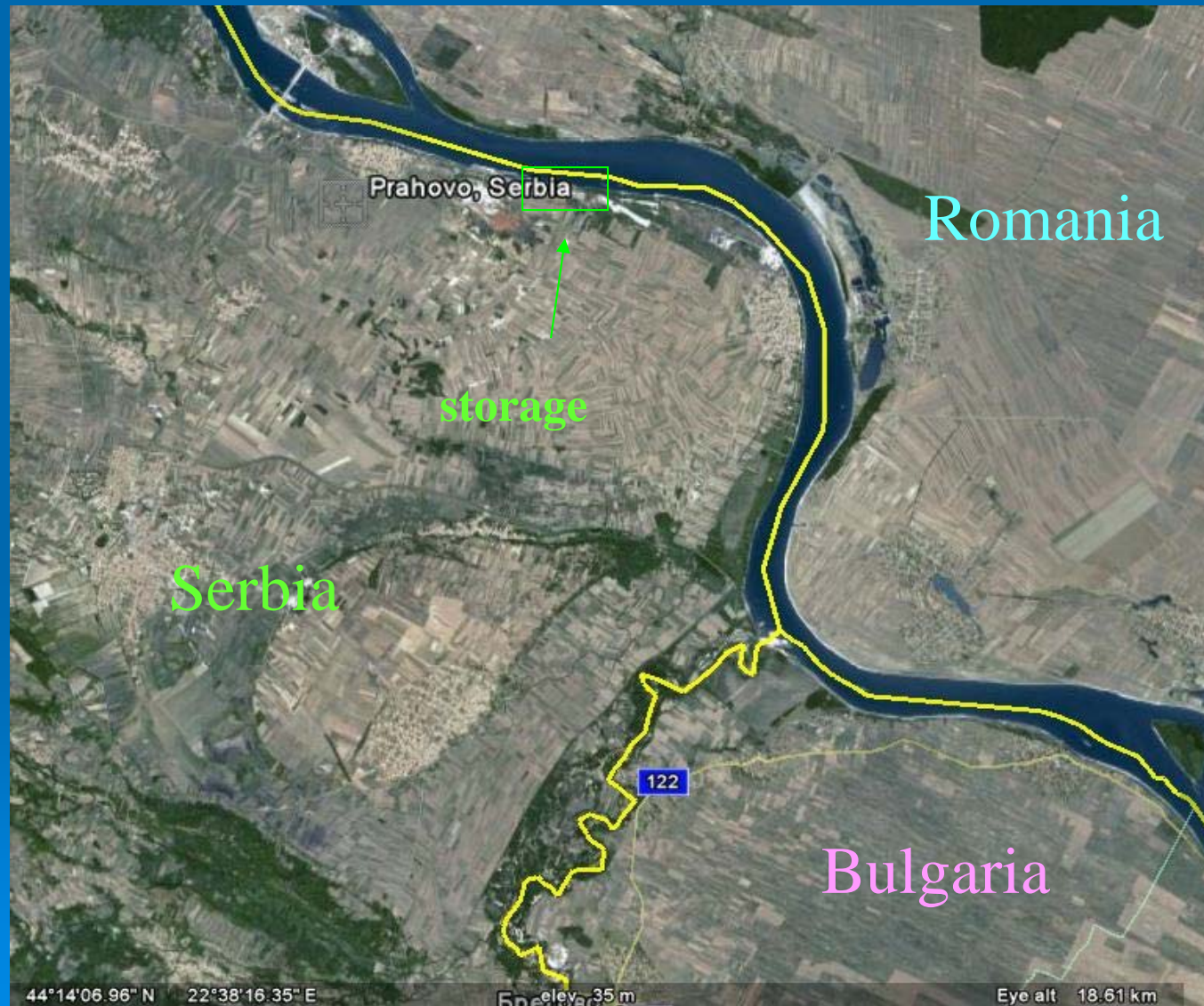
Hazard classification: Flammable, Dangerous for the environment

- Total capacity of the storage is: *24000 m³ of petroleum products (≈ 20 000 tones) - under the threshold of Annex I*

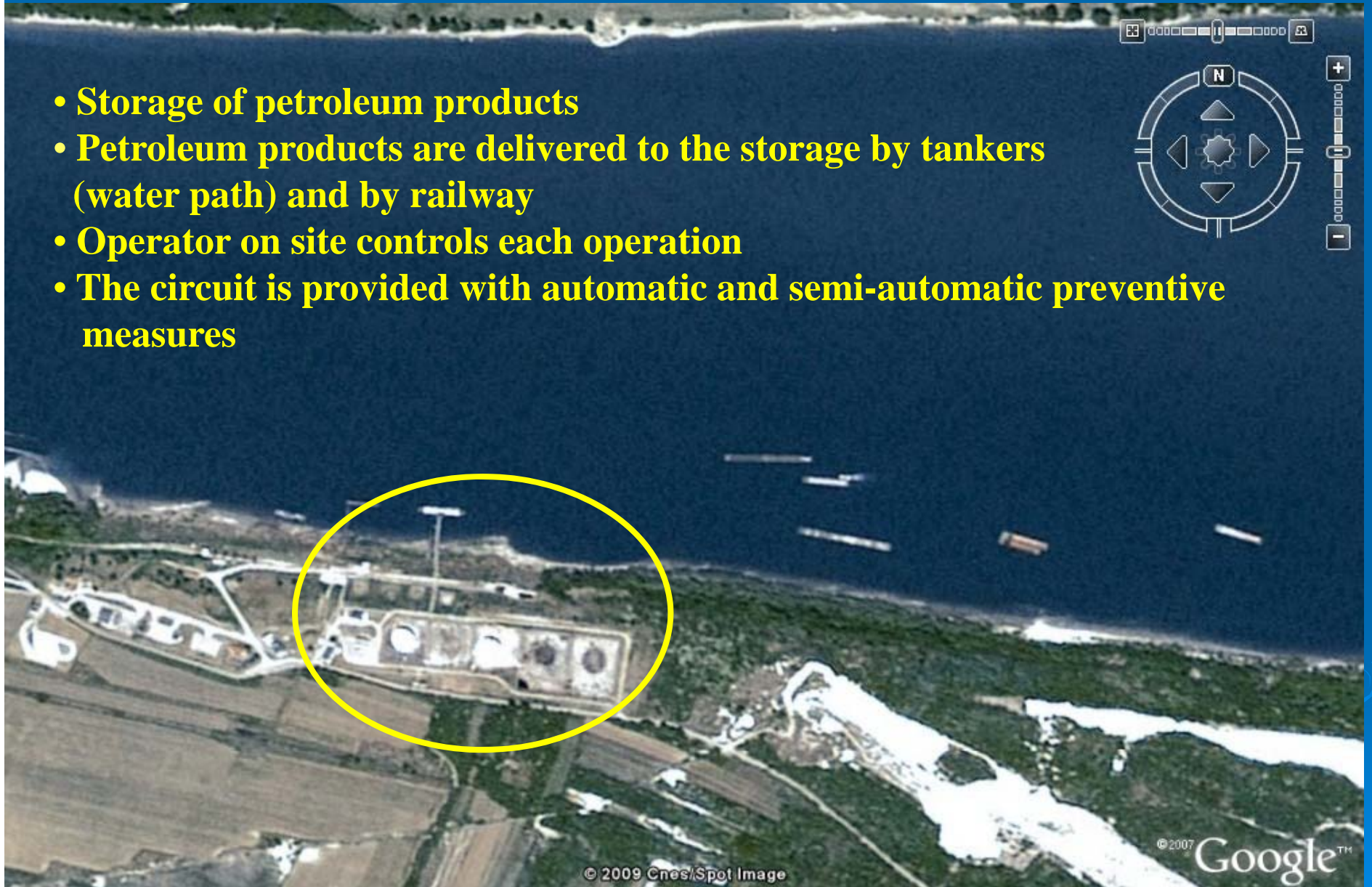
Location criteria

- Installation is located at the right side of river Danube, Eastern Serbia.
- Border with Romania is on the river Danube.
- Storage is approximately 9 km distant from Bulgaria through air path; approximate distance by water path to Bulgaria is 13 km.
- In diameter of 3km around the installation there are no protected natural resources, cultural or social objects.

Border between three countries



- **Storage of petroleum products**
- **Petroleum products are delivered to the storage by tankers (water path) and by railway**
- **Operator on site controls each operation**
- **The circuit is provided with automatic and semi-automatic preventive measures**



REFERENCE SCENARIO

Data for scenario

- Sudden rupture of loading arm (diameter of 200 mm)
- Release of 118 kg/s of diesel fuel on the Danube river

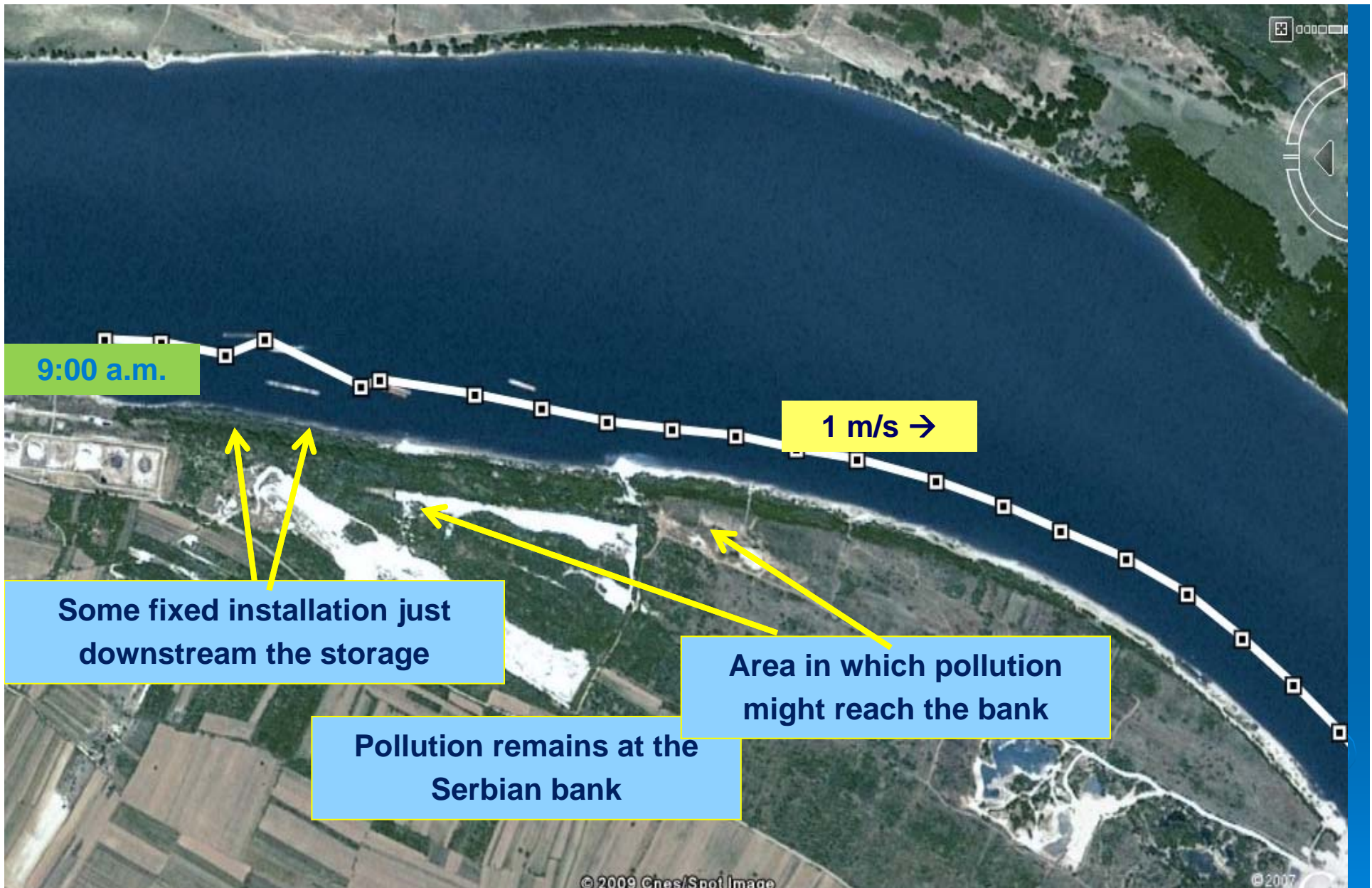
Mitigation measures

- Continuous presence of operators in the jetty
- Possibility to stop the pumps and isolate the line

Release time = 3 minutes

Total released amount = 21250 kg of diesel fuel

Google™



MODELLING – ASSESSMENT OF CONSEQUENCES

Use of modeling tools in assessing the movement of the spill

An aerial photograph showing a river system. A main river flows from the top right towards the bottom center. A tributary joins it from the left. The surrounding area is a mix of green fields and brownish agricultural plots. A white dashed line with square markers follows the main river's path. Three text boxes are overlaid: a blue one at the top left, a light blue one in the middle left, and a yellow one at the bottom left. Two yellow arrows point from the light blue and yellow boxes towards the river's confluence.

Pollution is directed towards the confluence of Timok river

In the rainy season, the flow rate of Timok tends to push the pollution in the middle of the river.

However, during warm season, flow rate of Timok river could be very low and not sufficient to push pollution away from the sands.

Environmentally valuable area



13:00 p.m.

Pollution very close to Timok river

At low (september) river flow rate, it would take at least 12 hours to oil spill to reach Vidin area

Vidin (Bulgaria) is 50 km downstream border

Conclusion

- **Hazardous activity meeting the substance criteria**
- **Quantity criteria – under the threshold quantity**
- **Within catchment area of transboundary and border river – 13 km distance from the border**
- **Risk assessment – assessing the movement of the pollution**
- **It is estimated that pollution will reach the border in four hours**
- ***Hazardous activity is under the Convention.***



THANK YOU FOR YOUR ATTENTION!