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# **A REPORT FROM THE DIRECTOR OF EMERGENCIES IN LVIV DISTRICT STATE ADMINISTRATION OFFICE, DEPUTY HEAD OF DISTRICT COMMANDER FOR COUNTERACTING EFFECTS OF AN EMERGENCY RESULTING FROM A TRAIN ACCIDENT IN THE BUSK REGION ON 16 JULY 2007**

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## **GENERAL CIRCUMSTANCES AND CLASSIFICATION OF THE ACCIDENT**

The accident took place 52 minutes past 4 pm, on 16 July 2007. 15 railway tanks (up to 50 tons each) with yellow phosphor derailed. When phosphor contacted the air, 6 tanks (nearly 300 tons) caught fire, and the products of combustion dispersed in a form of a cloud, moving north-east with the wind at a speed of 1m/sec.

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## **Dispersion zone of a phosphor burning products cloud**

- TOWARDS THE NORTH-EAST - 50 KM;
- TOWARDS THE NORTH-WEST – 29 KM;
- TOWARDS THE SOUTH-EAST – 12 KM;
- TOWARDS THE SOUTH-EAST – 15 KM.

A number of Lviv Region local administration territories found themselves within the accident zone, namely:

32 village councils, incorporating 97 villages with a population of 431 14, and area of nearly 193 square kilometres of following regions: Buski, Brodowski, Złoczowski, Kamionka Bużańska, and Radechowski.

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## **Activities taken by the executive bodies reporting to the President of Regional State Administration and Regional Command**

At 7 pm, on 16 June, a decision was taken regarding comprehensive action aimed at localisation and countering the effects of the emergency, including a decision of evacuation of the population of possible pollution zone and, in particular:

**Head of the Regional Emergency Centre for counteracting the effects of an emergency, Valery Albertowych Piatak**

- Notification of the general public;
- A Directive issued by the Head of Regional Civil Defence of 16.07.07 №27
- “On notification of principles of functioning of the Lviv ЄДЦ НС territorial sub-system (a uniform system of prevention and reaction to emergencies and accidents)”;
- A directive issued by the President of the Lviv Regional State Administration of 16. 07.07 № 715 “On establishment of a Regional Centre for counteracting the effects of an emergency”;
- The implemented “Plan of action of government institutions and district civil defence forces regarding counteracting and location of emergencies”;
- a decision was taken as to evacuation from 17 villages in the Buski Region (a directive issued by the President of Busk Regional State Administration Office of 16.07.07 №422)
- “On evacuation of Buski Region inhabitants”;
- A directive issued by the President of Busk Regional State Administration Office regarding the separation of Busk Regional State Administration Office from the regional budget fund
- 50,0 thousand hryvna to finance priority actions in counteracting an emergency;
- An order issued by the Head of Regional Civil Defence regarding the separation of material and technical reserve of 10 tons of fuel in order for emergency and rescue services to work smoothly, as well as Fire Brigades reporting to the Centre for Accidents and Emergencies in Lviv Area, subordinate units to the Ministry of Defence and Ministry of the Interior.

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In order to implement the Presidential Decree of the President of Ukraine of 17.07.07, on “Taking urgent measures to counteract the effects of an accident in the Lviv District” , and the Lviv District Council of 7.07.07, a plan has been developed and implemented

A plan of counteracting the effects of a technical accident and emergency in the Busk Region, as a result of derailing of 15 cistern with yellow phosphor, part of the cargo train № 2005 on the 12th km of Ożydów – Krasne railway line.

The, the following directives were issued by President of Regional State Administration Office:

- of 24.07.07 №761 “On taking urgent steps towards counteracting the effects of a railway accident in the Lviv District”;
- of 26.07.07 №778 «On carrying out comprehensive state ecological expertise of ecological situation which arose as a result of an accident and emergency in the vicinity of the village of Ozydów»;
- of 30.07.07 №800 “On establishing a national organisational committee to create a balance of counteracting the effect of accident”;
- of 10.08.07 №841 “ on sharing available resources from state reserve funds”;
- of 27.09.07 № 1013 “On sharing resources”;
- of 19.10.07 №1119 “On sharing available resources from state reserve funds”.

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**Between 16 June and 29 October, the following meetings took place:**

- 16 meetings of Centre for Accidents and Emergencies in Lviv Area on counteracting the effects of the accident;
- 2 special meetings of the Regional Committee on technical end ecological safety and emergency situations;
- 3 meetings of the Committee for organizing monitoring of the effects of the accident.

The first meeting, on location, of the Regional Centre on counteracting the effects of the accident on counteracting the effects of the accident, 19.00 16 July 2007

The first meeting, on location, of the Regional Centre on counteracting the effects of the accident on counteracting the effects of the accident, 21.00 16 July 2007 in the village of Ozydiw

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**On location, at 2 am, on 17 July, according to the Ukrainian Government directive of Na 17.07.07 №530-p, work was commenced by**

A Government Committee to research the causes of railway accidents

The first meeting of the Government Committee for counteracting the effects of the accident took place at 2 a.m., on 17 July 2007 in the village of Ozydiw

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**In order to secure scientific support and carry out cleaning up work, the following experts have been invited to co-operate:**

- Nowodzambul phosphor plant (Kazakhstan Republic);
- institute of Chemistry of the Lviv Technical University;
- Równie Water Management and Ecology University;
- State owned enterprise - „Сумигірхімпром”;
- Lviv Mining and Chemical Industry Institute BAT “Гірхімпром”;
- a battalion of chemical defence of 13th Army Corps of Ukrainian Army (Sambir).

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**For the purposes of implementation of the Regional Committee, the Centre developed**

A plan

Of emergency and repair action within the framework of the 2nd stage of soil reclamation at the accident location, area ecological monitoring, and social protection of inhabitants of the regions of Busk, Brodow, Złoczow, Kamionka Bużańska, and Radechowski District of Lviv which suffered from the effects of the railway accident.

- The plan has been implemented in full.

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**At all stages, the following were crucial elements of activities of area and district centres for counteracting the effects of emergencies:**

- analysis of the situation, organisational work and real steps taken towards implementing the decisions which had been taken;
- organizing collaboration between local administration offices, the Government Committee, companies, institutions and organisations of different type and ownership form, performing emergency effects counteracting tasks;
- organizing social and medical assistance and rehabilitation for the local inhabitants;
- organizing holidays and treatment for children;
- monitoring current situation in all towns and villages which had suffered from the effects of the accident;
- informing the general public about the status of local environment affected by the accident;
- planning budgets for counteracting the effects of the accident.

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### **EVACUATION**

The decision regarding evacuation was taken by the District Centre for counteracting the effects of the accident at approx. 9 p.m., on 16 July.

At 3 00. 30 min., on 17 July, evacuation of inhabitants of Buski Region to safe areas began.

Inhabitants of 17 villages were evacuated, where – on the basis of tests and information from operational groups - traces of phosphorus burning were discovered in the air.

902 people were evacuated, including 678 children.

The rest of evacuated inhabitants (2520 people, including 1508 children) left the zone of potential hazard on their own.

The total number of people evacuated from the zone of potential hazard was 3422, including 2186 children.

As of 20 July, everybody who had been evacuated, returned home.

**In our opinion, in view of a negative forecast for possible developments of the situation of 16 July, the decision regarding evacuation was right and timely.**

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### **Area Monitoring**

- With the view to implement the District Centre decision
- by the Regional Health and Hygiene Institute lab;
- veterinary medicine office;
- State Ecological Inspection;
- Regional Water Management;
- The Centre for Protection of Soil Fertility and Product Quality - “Облдержродючість”
- between 17 July and 16 September, samples of air, soil, water, foodstuffs – originating both from vegetables and animals, were taken and tested.

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### **In total, the following samples were taken and tested:**

- Surface waters quality – in excess of 250;
- Soil quality – in excess of 800;
- Drinkable water quality - in excess of 1200;
- Air pollution - nearly 1200;
- Quality of foodstuffs – originating both from vegetables and animals - in excess of 700;
- Forests and trees in the area of accidents have been visually inspected.

**Number of samples taken in total - 4 thousand.**

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### **Test results:**

Exceeding of upper limits of phosphorus concentration was noted in 62 samples taken directly at the location of the accident, and during the operation of counteracting its effects, including:

- air – 8 samples;
- Surface waste water – 33 samples;
- Soil before and after reclamation – 21 samples.

As of 29 October 2007, the following types of animals had been examined: 137453 cows and bulls, 98224 pigs, 46416 sheep and goats, 29976 horses, 1226789 chicken, ducks, and geese.

No deaths were noted among farm animals.

673 samples of green fertilizers, vegetables, apple, hay, corn, fodder, milk, cows' and bulls' blood, chicken, duck and geese blood samples were also tested.

**Lab tests proved that, in samples taken, the concentration of phosphorus did not exceed accepted standards.**

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### **Alternative tests:**

**Upon request of the Regional Council of Citizens**, and Regional State Administration, the Polish Podkarpacki Wojewodship Environment Protection Inspectorate took samples of soil and surface water on location, in order to test pollutant concentration.

Lviv District Monitoring representatives participated in comparative tests.

### **Following the test results, phosphorus compounds content was as follows:**

- In drainage waters, in a decanter, after filtration, upper Ukrainian limits are exceeded by 2,49 times, and Polish norms by 4,6 times;
- In drainage waters, in a container, on accident location, upper Ukrainian limits are exceeded by 12,44 times, and Polish norms by 22,6 times.

**Conclusion:**

- surface drainage water does not contain any traces of contamination with phosphor as a result of the accident;
- the soil does exceed upper limits of phosphor compounds content.

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#### **State experts research results**

The, the following directives were issued by President of Regional State Administration Office:

##### **In order to implement the decision of the Central Government Committee**

Regarding researching reasons of a railway accident in the Lviv Region by President of Regional State Administration Office, a directive was issued on 26.07.0, №778 «On carrying out comprehensive state ecological expertise of ecological situation which arose as a result of an accident and emergency in the vicinity of the village of Ożydów»;

State analysis has performed in accordance to the trilateral agreement, while the Lviv Railways were the **ordering** party, it was **initiated** by the Lviv District State Administration, and it was **subcontracted to the Academy of Sciences Natural Environment Geology and Chemistry Institute** and the Ukrainian Emergency Situations and Accidents Ministry.

##### **Conclusion: at present, there is no hazard for human life and business activities in the accident zone of influence.**

Test and research results has a positive influence on the mood of the population and functioning in the area affected by the accident.

As part of implementation of the decision of the **XV extraordinary session of Lviv Council**, the regional state administration ordered further monitoring of the area affected by the accident until July 2008, and obligatory quarterly notification of the Council and general public of test results.

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#### **Notification of the general public**

On the day of the accident

**Informing the general public** of the occurrence of the extraordinary situation, its character and giving recommendations regarding principles of behaviour in the area of chemical pollution, on the day of the accident is implemented via local information channels, using messages prepared earlier, and in direct transfer sent by cable radio, messages being sent by heads of state administration, medical staff and emergency situations organisations staff

Information was sent every 15 minutes.

Moreover, in order to execute the task of informing the population in Busk and Brodowski, Złoczowski and Radechowski regions, between 16-17 of July, task forces were directed there, comprising also of representatives of management of regional state administrations, organisations, representatives of internal affairs, and physicians.

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- The President of Ukraine, following a suggestion from the regional state administration office, decided to offer treatment to children affected by consequences of the disaster.
- In view of the above a regional centre was set up to organize the children's treatment
- Total number of schoolchildren and preschool children from regions affected by the disaster, number of referrals, and numbers of children sent to holiday camps are as follows:
- Planned for treatment in general: 7487 people,
- including 5075 schoolchildren;
- preschoolers with mothers: 2412.
- Generally, 5775 preschoolers and school children were referred to treatment and sent to holiday camps.
- 1901 children did not take up the offer.

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#### **Regional infrastructure at work**

- Commercial and service networks, communications, postal services, transport companies in all five affected regions worked normally.
- In some places of Buski region affected by the consequences of the accident, 17 private businesses suspended business in July.
- Creameries in Busk and Złoczów regions suspended purchasing milk between 17 and 19 July.
- Thanks to actions taken by regional and district state administration offices, the companies were back in business 2 days later, purchase of milk was resumed by creameries on the fourth day - 20 of July.
- Between 17 and 20 July forest work and logging in Ożydów Forestry was stopped.
- Between 16-17 July, major road works executed by "Охуп", were stopped on the Kiev-Czop, and resumed on full scale on 18 July.
- According to Lviv Stationmaster's orders, due to the safety of railway traffic, special train timetable was introduced as of 24 July

- Harvest was stopped in the Buski region for two days 17-18 July.
- **Generally, the incidents listed above remained without influence on economic indices or general comfort of life.**

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**Sanitary and medical effects, and medical assistance organisation**

- Thanks to treatment and prevention health service institutions in the Lviv area, and Lviv Regional Emergency and Accident Medicine Centre, since the beginning of the accident, participants of rescue action and local inhabitants had been offered assistance.
- 6 medical emergency units were sent in the first few hours. 3 specialized intensive therapy units were sent from Lviv ambulance station.
- The first participants of rescue action who had been hurt, were sent for hospitalisation in Busk Central Regional Hospital, to hospitals in Lviv, Busk Central Regional Hospital, Redechów, Brodów, Kamionka Bużańska, and Złoczew.

Generally, in the region, between 17 July and 9 September 2007, 320 people were hospitalised, including 83 children. Diagnosis: severe inhalation related phosphor combustion products poisoning was confirmed in 174 patients, including 23 children.

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**Sanitary and medical effects, and medical assistance organisation**

- 4 for rescue workers of the Central Command at the Ukrainian Ministry of Emergencies in Lviv Region and Lviv Railways were taken to hospital in serious condition.
- Serious injuries or death had not been recorded.
- Repeated referrals to hospital, cases of health deterioration in diagnosed patients had not been recorded.

Members of the Central Government Committee visited the patients in hospital.

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**Sanitary and medical effects, and medical assistance organisation**

In general, medical assistance was offered by:

- 16 health service institutions;
- 38 emergency units;
- 27 ambulances;
- 31 hospital wards, strengthened by extra 860 medical staff.

Location of provisional medical centre in the area of the accident.

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**Sanitary and medical effects, and medical assistance organisation**

- A month after the discharge from hospital, the patients with severe inhalation related phosphor combustion products poisoning were re-examined.
- Pathological changes in blood, liver and kidney damages have not been diagnosed. All patients diagnosed with severe inhalation related phosphor combustion products poisoning remained under supervision of local outpatient clinics for a year.
- Three USG machines, which cost in total 830 thousand hr., were bought for the reserve fund money which, following the Ukrainian President's decree, was channelled to Lviv, on 21 July 2007, and on 22 July, O.I. Kuźmuk Deputy Prime Minister, and J.O. Hajdajew the Minister of Health handed it to head doctors from Central Regional Hospitals in Busk, Brodow, and Radechow.

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**Soil reclamation at accident location**

Soil reclamation at accident location took place under the supervision of w working group, specialised in reclaiming polluted soil on location of the railway accident, delegated by a Central Government Committee involved in researching the causes of the railway accident in the Lviv Region (protocol of 22 July 2007), in keeping with the requirements of *"Regulations concerning priority actions for reclaiming the area at the Krasne-Ożydów section of Lviv Railway tracks"*, developed by the Lviv Mining and Chemical Industry Institute BAT "Гірхімпром" in collaboration with the Równe Water Management and Ecology University.

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**Soil reclamation at accident location**

Priority actions, as part of the 1<sup>st</sup> stage of soil reclaiming on location of the accident were concluded on 27 July.

The following was done, in keeping with the *Regulations*:

- Phosphor combustion products collection;
- Collection of neutralized phosphor;

- Collection, and shipping away of nearly 100 tons of contaminated soil and water mix; neutralisation of phosphor combustion products with 120 tons of lime;
  - 4000 m<sup>3</sup> of inert subsoil was moved away including 1760 m<sup>3</sup> of black-earth ;
  - grass was seeded on reclaimed plot of land.
- The area of reclaimed plot of land, during 1<sup>st</sup> stage of work, was 6000 m<sup>2</sup>.

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#### **Soil reclamation at accident location**

Priority action of the 2<sup>nd</sup> Stage of soil reclamation in the area bordering with accident area ended on 13 August.

At this stage of work, according to Rules and Regulations:

- 15 cisterns were pumped (900 m<sup>3</sup>) with polluted with water;
- a 230m long drainage ditch built, capacity of earth work - 1035 m<sup>3</sup>.;
- a 5750 m<sup>2</sup> planned reclamation of the area was executed;
- a m<sup>3</sup> water container was erected, in order to pump water into rail tank cars;
- inert soil was spread over they powdered Vnerntym area with the ground, all in all 2048 m<sup>3</sup>.
- sanitary cuts and clearing of the belt in 1800 m<sup>2</sup> of the forest.

The area of reclaimed soil on the plot of land during the 2<sup>nd</sup> stage of work was 5750 m<sup>2</sup>.

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#### **Soil reclamation at accident location**

Reclamation work

- The 1<sup>st</sup> and 2<sup>nd</sup> stage of reclamation was carried out under the supervision of representatives of Busk and Ożydów Local Councils.

Total value of soil reclamation work was **791,32 thousand hr.**

At present, reclaimed land is fit for agricultural activity.

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#### **Material and technical provisions**

In order for the rescue teams to work efficiently, and counteract the emergency, carry out evacuation and feed the survivors, do necessary accident repair work, the following amounts were allocated:

- from the regional reserve fund - 50 thousand hr. to Busk Regional Government Administration to secure food and water for evacuated inhabitants of the area;
- from the material and technical reserve of resources – 10 thousand litres of fuel for the Central Directorate of Ukrainian Ministry for Emergencies and Accidents, and for other force units;
- From the central government reserve fund – 15 115,0 thousand hr. for the most urgent accident repair work, including:
- Following the directive of the Ukrainian Central Government of 26 July 07 №583 *for countering the effects of the emergency* - 14815 thousand hr.;
- Following the directive of the Ukrainian Central Government of 6 September 07 №700-p, regarding *priority accident repair work in the Ożydów secondary school, and in outpatient and clinics* - 300 thousand hr.
- Apart from the above, at all stages of accident repair work, resources and equipment belonging to local companies, non-profit organisations, political parties, and businesses was also used.
- General financial, and material-technical support made it possible to perform accident repair work, and full scale social rehabilitation of the local population.

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#### **Population protection organisation**

In order to secure public safety, twenty-four-hour duties and protection of the villages which suffered the effects of the accidents took place were organized, employing Ministry of the Interior military units, part of the Western Territorial Command, and Central Command of the Ministry of the Interior in the Lviv District units.

Members of those formations were used to disseminate information on the emergency among local population, and measures taken to control the situation.

In villages and other locations where, between 16-27 July, preventive measures were taken, public order was not breached, there were no criminal acts or protests.

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#### **Public safety organisation**

- At the Krasne railway station, on 23 July, nearly 100 local inhabitants organised protests, including blocking the railway tracks used to transport the yellow phosphor and earth carried away from the location of the accident. As the result of those activities, 5 inter-regional trains, and 3 local trains were stopped.
- Railway traffic was stopped for 2 hours and 45 minutes altogether.

- No direct physical force was used to control those who blocked the tracks.
- The local administration and members of the Central Government Committee pacified the situation, and railway traffic was restarted.
- The, in order to prevent subsequent railway tracks blocking in the area where accident repair work was carried out, 7 groups were set up whose task was to carry out prevention activities among local population. Those groups consisted of employees of Ministry of the Interior and heads of village councils.

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**Forces sent to counteract the effects of the accident**

Following forces were sent directly to the accident location:

From the Republic of Kazakhstan:

- A group of specialists, headed by the General Manager of Nowodzambul Phosphor Plant

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**Forces sent to counteract the effects of the accident**

On behalf of Ukrainian Ministry for Emergencies and Accidents:

- Directorate of the Lviv Region Ukrainian Ministry for Emergencies and Accidents;
- Units of specialised state repair services, part of Ukrainian Ministry for Emergencies and Accidents (units from Iwano-Frankowsk and Dniepropietrowsk);
- The First Emergency Repair Unit of Ministry for Emergencies and Accidents (Drohobycz).

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**Forces sent to counteract the effects of the accident**

On behalf of the Ukrainian Army:

- 704 Specialist Radiation, Chemical, And Bacteriological Pollution Regiment, part of 13 Army Corps.

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**Forces sent to counteract the effects of the accident**

On behalf of the Ukrainian Ministry of the Interior military units:

- 45<sup>th</sup> Regiment of the Western Territorial Command of the Ukrainian Ministry of the Interior (Military Unit 4114);

On behalf of the Ukrainian Ministry of Transportation and Communications:

- emergency, repair and fire brigades, part of the State Territorial Union – “*the Lviv Railway*”
- The First Jointed Unit of specialist state transportation service ( Military Unit T 0200 Czerwonogród).

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**Forces sent to counteract the effects of the accident**

As part of Civil Defence Forces of the Lviv Region:

- Regional Command for counteracting the effects of emergencies and accidents;
- Regional Committee for technological and ecological safety and emergencies;
- Regional Civil Defence Services (protecting public order, providing medical services, water management, veterinary medicine, ecological, information, communications, and others).

Structural units of regional state administration:

- Health Services Department;
- Agricultural and Industrial Development Department;
- Economic Department;
- Financial Department;
- Education and Schooling Department;
- Emergencies Office;
- Youth and Family Department;
- Media Contacts and Social Relationships Department.

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**FORCES SENT TO COUNTERACT THE EFFECTS OF THE ACCIDENT**

- Busk, Brodowa, Kamionka Bużańska, Radechowska, and Złoczow local administration offices and Civil Defence units;
- Companies, institutions and organisations in the Lviv Region, in accordance with the plan of reaction and collaboration in case of emergencies and industrial accidents.

The composition of units sent to do the job was in keeping with tasks in hand of counteracting the effects of the emergency, which made it possible to perform priority repair work within the time frame set by the President of Ukraine.

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**Problems encountered in the course of counteracting the effects of the emergency.**

- The most important, and least organised, was the section dealing with collaboration with village councils and population, and in particular the following:
- Information about the emergency and its development had not reached the vast majority of village council heads, and village population on time;
- Village council heads were unable to set up emergency effect counteracting teams on their own, and efficiently influence the way territorial infrastructure operated (companies, canteens and restaurants, health services, transportation, and so on);
- Some village council heads have lost control and could not influence visible social tensions which manifested in accusations towards regional and area administrations of inefficiency of actions taken, and ambiguity of information regarding the effects of the emergency.

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**Problems encountered in the course of counteracting the effects of the emergency.**

- Transportation was a weak link, because privately owned transportation companies, as of today, have no obligations towards state administration, and are not obliged to provide their fleet for evacuation transport needs.
- Still uncertain are the issues of organising work in privately owned trade and service companies in case of an emergency or industrial accident.
- The role of local information and communication media is unclear, as they are not obliged to inform the general public in timely manner about emergencies or industrial accidents, and about the way such accidents are dealt with, as well as about the principles that must be observed by the general public in such situations.

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**Summary of activities related to counteracting the effects of the emergency.**

1. Hazards for the population and the area have been effectively dealt with:
  - in all tested samples of drinkable water, surface waters, soil, landscape, vegetable and animal products, after 1 August 2007, exceeding of upper allowed limit of concentration of polyphosphates (3,5 mg/ dm<sup>3</sup>) has not been found, except for the canal which drains water from the accident area, where normative concentration was exceeded by 3.9 times the upper allowed limit of concentration (as of 1 June 2009 – within normal values).
2. The area (soil, water) nearby and at the location of the accident is fit for normal use.