

Belügyminisztérium Országos Katasztrófavédelmi Főigazgatóság



National Directorate General for Disaster Management (NDGDM), Hungary

## Red Sludge Accident in Hungary 4th October, 2010

Colonel László BÉRCZI Inspector General for Fire-fighting, NDGDM Hungary's most severe industrial disaster so far occurred on 4th October 2010, when the dyke of a cassette of the sludge reservoir breached on the site of the Hungarian Aluminium Production and Trade Private Limited Company (MAL).



#### **Location of the accident The distance from Budapest is 165 kms.**







#### **Consequences of the dyke breach**

- 1 million m3 of red sludge and alkaline water spilled out;
- Three settlements were inundated: Kolontár, Devecser and Somlóvásárhely;
- 10 people died
- 286 persons were injured
- 369 buildings were damaged

# Over a thousand hectares of arable land were contaminated

Location	Buildings to be demolished	Buildings to be reconstructed
Devecser	270	21
Kolontár	34	11
Somlóvásárhely	2	31
Total	306	63

#### The Red Sludge

- Bauxite Alumina Aluminium
- It is a by-product of aluminium production with high iron content;
- It has a characteristic colour, it contains both fluids and solids; pH between 11 and 14.
- When producing 1 ton of alumina, 1.5 to 2 tons of red sludge is created;
- All components insoluble in water remain

#### The distance between the cassette and Kolontár is 6 kms.



#### **Red Sludge Disaster – Fire Alarm**

- At 12:28 on 4th October a police patrol reported a large amount of water flowing from the direction of Kolontár.
- The police alarmed the Ajka Professional Fire Brigade. The Fire Station is 20 kms away from Kolontár.
- The fire duty officer called the dispatcher of the plant, who gave the following information: it is a normal water drainage procedure.
- Several notifications by the population
- The duty shift officer alerted the first crews: 2 fire trucks with 9 fire-fighters.

### Map of the settlements Kolontár, Devecser and Somlóvásárhely and the damaged cassette (marked with red colour)



#### **Red Sludge Disaster – Fire Alarm**

- The duty shift officer alerted 5 other fire trucks with 15 firefighters.
- The rest of the personnel, even the ones on leave, were also alerted.
- 24 other fire trucks with 106 fire-fighters from the neighbouring counties.
- 6 Emergency Detection Teams (EDT) with their personnel and equipment

#### **Location Number One: the corner of the sludge reservoir cassette**



#### **Location Number Two: Kolontár**



#### **Location Number Three: Devecser**









## **Self-decontamination**



#### Initially, the composition and the risks of the sludge were not known.



#### **Rescuers used heavy machinery in the beginning**



## **Onsite Operation Staff**

- Established by the Hungarian Government
- Tasks:
  - **1. Coordination of the mitigation**
  - 2. Coordination of the activities of partner organisations
  - 3. Command and control
  - 4. Providing protective equipment and garments for the rescuers
  - 5. Receiving and registering donations and the labour force offered.

## **Onsite Operation Staff**

**Onsite tasks focused on three main areas:** 

- cleanup of built-in areas;
- decontamination of outer areas;
- water quality damage elimination of living waters.

After the initial protection efforts, long-term measures for rehabilitation and reconstruction came to the fore.

## **Onsite Operation Staff**

**Other tasks of the Operations Staff were to continuously control** 

- the cleaning of streets, footpaths and other public areas;
- decontamination of forecourts;
- cleanup of backyards and courtyards;
- decontamination of trafficking vehicles;
- the continuous monitoring of living waters and drinking water sources, and the concentration of dust in the air.

#### The police closed down the affected areas



#### **Evacuation and accommodation**



## **Figures of the response forces and equipment**

#### On 6th October

- 84 fire-fighters with 12 vehicles
- 29 persons with 20 vehicles disaster management and civil protection units
- 12 persons with 4 vehicles Emergency Detection Teams (EDT) of the disaster management
- 103 police officers with 22 vehicles
- 174 military personnel with 39 vehicles
- 5 persons with 2 vehicles National Medical Service
- 50 workers MAL
- 149 civilian persons with 43 machines

## **Figures of the response forces and equipment**

#### On 6th October

606 persons with 142 equipment

#### On 20th October

1 125 persons with 292 equipment

## In November

- 8 535 persons with 4 881 units of equipment
- 4-500 persons with 70 equipment in average

#### **Evacuation and accommodation**

- 1. There was a threat of a new dyke breach, on 09 October.
- 2. Evacuation was ordered for the entire population of Kolontár.
- 3. 5 evacuation zones, 213 buildings
- 4. Evacuation mainly by trains,
- 5. Evacuation using the mobile equipment of the army and the disaster management.

## **Governmental Coordination Center for Reconstruction** (GCCR)

- From 4th November 2010 till 1st July 2011
- 44 personnel
- Tasks:
  - 1. damage mitigation
  - 2. rehabilitation
  - 3. reconstruction

## The building of the Governmental Coordination Center for Reconstruction (GCCR) was a restaurant before.



## **Governmental Coordination Center for Reconstruction** (GCCR)

- The Government decided on the mitigation of the victims, concerning both movable and immovable properties.
- The implementation of rehabilitation and reconstruction was organised by the disaster management.
- This work started on 3rd December.
- The following options were available to the victims: new buildings, purchase of used buildings, reimbursement of the repair costs, cash.

## **Governmental Coordination Center for Reconstruction** (GCCR)

#### In the framework of this procedure the victims received:

- 110 new buildings
- 119 used buildings
- 113 reimbursement cases in cash
- 9 reimbursement cases of the repair costs
- 1 exchange of property
- 21 pending issues

## **110 new buildings**









#### Map of the Memorial Park in Devecser



## **Memorial park in Devecser**

- on the first anniversary of the disaster
- the park is 8 hectares
- 3 exhibition ponds, half hectare each
- meadows, footpaths, benches
- a place of memory and recreation

## Summary

- complex tasks
- lives saving of persons in direct danger
- searching the buildings to find the missing people
- fire-fighting operations
- damaging buildings or demolishing them for safety reasons
- the entire personnel performed to their maximum
- organising their replacement

## **Summary**

- 197 persons received immediate medical check.
- Less than 2.5 % of the personnel were injured or had health complaints.
- The personnel involved in the intervention will be medically screened every year to monitor their health status, because of the long-term effects of the red sludge and the flying dust.



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## Thank you for your attention!

Colonel László BÉRCZI Inspector General for Fire-fighting, NDGDM