

## Leak on a truck after filling in an LPG depot.

March 29, 2002

Arleux [Nord]

France

Leak  
LPG depot  
Propane  
Tanker truck  
Bottom valve  
Purge  
Equipment failure  
Periodic inspections

### THE INSTALLATIONS IN QUESTION

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#### The site:

The accident occurred on a public thoroughfare, upon exiting an LPG depot.

### THE ACCIDENT, ITS BEHAVIOUR, EFFECTS AND CONSEQUENCES

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#### The incident:

At 6.40 am, a tanker truck containing 7,5 t of liquefied propane hangs portal of a filling centre. A leak occurred on the tank on the downstream purge valve of the distribution pump (dia. 12 mm) enclosed in the vehicle's side compartment. The tearing away of the compartment caused the purge to rupture. This element is located between the bottom valve and the shut-off valve. In addition, the bottom valve was not hermetic. The depot manager actuated the site's emergency stop and initiated the internal contingency plan. Three individuals present at the site begin using fire nozzles (3) connected to the fire hydrants to limit the cloud of gas and form an ice plug. The firemen took over upon their arrive and used the equipment +set up by the centre's personnel. At 9.27 am, operations began to drain the truck to a flare stack in order to burn the gases released. The latter, placed 50 m from the truck, was ignited to lower the pressure in the tank. At 11.00 am, the pressure had dropped considerably and the ice plug stopped the leak.



Tests to close the bottom valve were performed although, due to the pressure, the ice plug ruptured and the leak continued. After several attempts, the bottom valve was loosened and closed. The tank was rendered hermetic once again. A mechanical plug was placed on the pipe. The operations were completed around 12.30 pm. The tank was then drained and rendered inert.

#### The consequences:

The accident resulted in the release of 4 t of propane into the atmosphere.

#### European scale of industrial accidents

By applying the rating rules of the 18 parameters of the scale made official in February 1994 by the Committee of Competent Authorities of the Member States which oversees the application of the 'SEVESO' directive, the accident can be characterised by the following 4 indices, based on the information available.

Dangerous materials released		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human and social consequences		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental consequences		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic consequences		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The parameters that comprise these indices and the rating method are available at the following address:  
[www.aria.ecologie.gouv.fr](http://www.aria.ecologie.gouv.fr)

The value of 3 is attributed to the index 'Dangerous materials released' due to the leakage and burning of about 4 tons of propane (parameter Q1).

## ORIGIN, CAUSES AND CIRCUMSTANCES OF THE ACCIDENT

According to the initial elements of the inquiry, the tanker truck driver had apparently actuated the digicode of the automatic gate which consists of 2 parts which open inwardly, then did not wait until it was completely open. He stopped 7 to 8 m further on, after having become aware of the leak.

Owing to the impact, the movement of the compartment caused the purge connection to be ripped away: for info, this device was installed in the last few years to test the bottom valves for leaks and is indicated in the CFBP specifications.

The resulting leak clearly indicated that the bottom valve had not been closed completely (existing prior to the accident): This is due to the deformation of the plate supporting the bottom valve's actuating cylinder. In the case of the truck involved, the actuator consists of a pneumatically-controlled ¼-turn pneumatic valve.



## LESSONS LEARNED

### Historical reminder:

Since 1998, (feedback from the Divonne-les-Bains accident of 1996), technical specifications issued by the CFBP requiring, for the specifications of small transport trucks, a technical option enabling the tanker truck's bottom valve to be operated by an external control.

### Feedback about this accident:

*Following the event in question, a series of bottom valve leak tests were performed at the profession's initiative.*

*Since that time, periodic verifications have been integrated within site programs.*

### **Other events mentioned:**

- Divonne-les-Bains (Ain), 08/21/1996: see summary No. 9802 in the appendix.

**APPENDIX****No. 9802 - 08/21/1996 - AIN - DIVONNE-LES-BAINS***55.1 - Hotels*

After a small propane tank had been filled from a delivery truck, the hose burst when the pistol was disconnected from the tank; nearly 5 t of propane was released in 15 minutes. A dense and opaque cloud drifted 100 m, requiring the firefighters to retreat. The operator was unable to stop the pump; 13 hotel occupants and 9 employees were evacuated. The cloud ignited, causing the hotel to explode and collapse. An adjacent pavilion burst into flames. The flow eventually stopped. The operator was seriously injured and died a week later. The firefighting waters polluted 500 m of waterway downstream from the site. The condition of the hose is suspected. The vehicle's safety elements were inspected. Various negligence factors were discovered in the unloading operations.