

Thirty Years Ago – An LPG Tragedy

November 2014



At about 5:30 AM on November 19, 1984 there was a major fire and a series of explosions at a liquefied petroleum gas (LPG) storage and distribution terminal at San Juan Ixhuatepec, Mexico City, Mexico. There were approximately 600 fatalities, approximately 7,000 injuries, 200,000 people were evacuated, and the terminal was destroyed. The blasts were recorded on a seismometer 20 km (12.4 miles) away, and the largest blast registered 0.5 on the Richter scale. Most of the injuries and fatalities were in the surrounding community – people were living as close as 130 m (425 ft.) from the terminal.

The cause of the accident could not be definitively established because of the destruction of the facilities and absence of witness reports. It is believed that LPG leaked from a tank or pipeline into a walled enclosure. LPG vapors formed a flammable vapor cloud about 2 m (6.6 ft.) high. The cloud was ignited, possibly by a ground flare.

There is evidence that some storage tanks in the facility may have been overfilled, leading to diversion of LPG flow to ground flares. The initiating release may have come from overfilling a tank or overpressure of one of the storage tanks.

Many causes contributed to the disaster, including the design of the terminal (for example, inadequate spacing of tanks, ineffective gas detection, lack of passive fire protection systems), destruction of the fire fighting system by the explosions, improper maintenance of safety equipment, and a large number of people living close to the terminal.

Did you know?

Although there were many facility design factors which contributed to the disaster, it is also reported that the local plant safety committee found a number of operational safety problems before the incident.

- ❖ Housekeeping was poor
- ❖ 30-40 % of safety devices, including fire water spray systems, were inoperative or bypassed
- ❖ A relief valve on an LPG receiving manifold was missing
- ❖ Pressure gages were inaccurate and in poor condition

What can you do?

- ❖ Understand the magnitude of a potential incident in your plant, and what safety systems are in place to prevent and mitigate the event.
- ❖ Report all failures of safety systems and equipment and ask your management to have them repaired.
- ❖ Check that all pressure relief devices are inspected and maintained as required by your plant's policy.
- ❖ Confer with your safety and production engineers to determine how to manage risk, including the possibility of shutting down, if critical safety equipment is not working properly.
- ❖ Remember that poor housekeeping in a plant is often a symptom of a poor safety culture. Take care of your plant and all of its equipment, especially safety equipment.

Take care of your plant's safety systems so they can take care of you!