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Sandoz fire, 40 years on



Description

Shortly after midnight on 1 November 1986, a fire broke out in Warehouse 956 at the Sandoz chemical storage site in Schweizerhalle, near Basel, Switzerland. The warehouse held large quantities of toxic and ecotoxic products, including more than 800 tonnes of organophosphorus insecticides and 11 tonnes of water-soluble mercurial fungicides. Around 160 firefighters responded, and the fire was contained shortly before 7 am.

The official investigation concluded that the fire was probably initiated during shrink-wrapping work using a blowtorch. Paper sacks containing Prussian blue could smoulder without visible flame or smoke before the fire developed rapidly. About 20,000 cubic metres of contaminated firefighting water entered the Rhine, carrying up to 30 tonnes of pesticides. A non-toxic dye turned the river red.

Fish and other organisms were killed along hundreds of kilometres of the river. Almost the entire eel population was lost between Schweizerhalle and the Loreley, more than 400 kilometres downstream. Drinking-water abstraction from the Rhine was suspended as the pollution moved through Germany towards the Netherlands.

Key findings

- Heat applied during shrink wrapping created a concealed smouldering fire that developed later. Hot work controls must therefore cover temporary and routine tasks, the properties of packaged powders and the possibility of delayed ignition.
- The accident exposed the consequences of underestimating storage hazards. Inventory, packaging, segregation, fire compartmentation and the behaviour of substances in a fire require the same systematic assessment as hazards in production processes.
- Firewater containment and drainage isolation must be designed for credible application rates and volumes, not only for normal drainage conditions.
- Emergency information and communication were inadequate. Responders faced containers of uncertain content, local advice was contradictory, nearby areas in France and Germany were not warned promptly, and the international Rhine alarm was delayed.
- The accident became a turning point. It led to the Rhine Action Programme, stronger international warning arrangements and the Swiss Major Accidents Ordinance. The 1988 amendment to the Seveso Directive also strengthened storage requirements and brought isolated hazardous storage within its scope.

Why does it concern me?

Sandoz showed that a major accident does not need to cause fatalities or a large explosion to have severe and lasting consequences. Environmental damage can extend far beyond the establishment, cross national borders and disrupt drinking-water supplies and ecosystems for hundreds of kilometres.

Firewater is sometimes considered only after a fire has started. Yet the expected volume, contamination, drainage route and available containment should be understood in advance. Otherwise, a necessary emergency action can create a second major accident pathway.

Forty years later, the lesson remains highly relevant. Effective major-accident management must consider what can leave the site through water, air and soil, how quickly those consequences may travel and who must be warned beyond the immediate emergency area.

Ask the following questions:

- Is an accurate inventory of stored hazardous substances available to emergency responders?
- Have the quantity and composition of contaminated firefighting water been assessed?
- Can drains be isolated and is sufficient firewater retention available?
- Are incompatible materials and large quantities of combustible material adequately segregated?
- Would downstream users and neighbouring countries receive a clear and timely warning?
- Are environmental receptors considered in emergency planning and major-accident scenarios?

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