Issue No. 9

GLOBAL
Industrial Safety Solutions

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Toulouse, 2001

When a familiar material becomes a major accident

Description

On 21 September 2001, a major explosion occurred at the AZF fertiliser plant in Toulouse, France. The explosion originated in building 221, where several hundred tonnes of ammonium nitrate material were stored.

The explosion killed 31 people and injured thousands. Buildings were extensively damaged both on and off site, including homes, schools and businesses. The consequences extended several kilometres into Toulouse, demonstrating the vulnerability created when a major-hazard establishment and a densely populated urban area exist in close proximity.

The precise initiating mechanism of the explosion became the subject of extensive investigation and debate. What was beyond dispute was the catastrophic potential of the material present and the scale of the consequences once that potential was realised.

Key findings

- Ammonium nitrate is widely manufactured, stored and used, particularly in the fertiliser industry. Familiarity with a material must not be confused with an absence of major accident potential. Its behaviour depends on its physical condition, composition, contamination, confinement and the conditions under which it is stored.
- The material in building 221 included downgraded and off-specification ammonium nitrate. Materials outside normal production specifications require the same systematic understanding and control as finished products.
- The accident demonstrated the importance of considering the full consequences of a credible major accident. The effects were not confined to the establishment. The proximity of residential areas and other vulnerable developments contributed substantially to the scale of the societal consequences.
- Toulouse became part of European regulatory learning. Together with other major accidents around this period, it contributed to changes to the Seveso II framework, including revision of the ammonium nitrate and ammonium nitrate fertiliser categories in Annex I.

Why does it concern me?

Materials that have been handled safely for many years can gradually become regarded as routine. The hazard, however, does not become smaller because the material is familiar.

Off-specification products, residues, returned material and material awaiting reprocessing can fall outside the attention given to normal production. Yet changes in composition, contamination or storage conditions may alter their hazard significantly.

Land-use planning is equally part of major accident prevention. Where high-hazard installations and communities are close together, prevention remains essential, but the potential consequences of failure must also influence decisions about development around the establishment.

Ask the following questions:

- Do we understand the major accident potential of all hazardous materials on site, including off-specification, downgraded and waste material?
- Are storage, segregation and contamination controls based on the actual condition and properties of the material?
- Have credible worst-case consequences beyond the site boundary been considered in emergency planning and land-use decisions?
- Could familiarity with a routinely handled substance be influencing how seriously its major accident potential is treated?