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The Seveso Directives and the UK Control of Major Accident Hazard (COMAH) regulations

The problem

Since the onset of the industrial revolution, incidents involving chemicals and industry have led to significant loss of life worldwide. The accident at Flixborough, United Kingdom in 1974, in which a vapour cloud explosion killed 26 people and injured many more, almost triggered a "domino-effect" incident at a neighbouring site. [1] At Seveso, Italy in 1976 a chemical plant producing pesticides and herbicides released a large cloud of dioxins. Whilst no fatalities were immediately reported at Seveso, dioxins are known to be lethal in man, even in very small doses. A large area of land was contaminated, 600 people had to leave their homes and up to 2000 were treated for dioxin poisoning. [2]

These two incidents resulted in Seveso Directive I in 1982, which was implemented by the Control of Industrial Major Accident Hazards Regulations 1984 (CIMAH) in the UK. Incidents in Bhopal, India 1984[3] and San Juanico, Mexico 1986 [4] led to more changes in the directive, mostly stronger enforcement of the current directive, resulting in the UK in COMAH in 1999after EU implementation of Seveso directive II. [5]

Since then, more industrial accidents have shown weaknesses in legislation of these directives, and the rate of industrial accidents globally has remained relatively stable. [6] Although this stability rather than decrease can be put down to rapid global post-millennial industrialization, accidents are happening for new reasons or due to lack of enforcement. For example, the Buncefield disaster in 2005was attributed to poor legislation. [7] A review of the Seveso incident revealed that there were no protocols in place for such an incident, and recommended that plans and procedures be developed for major incidents in industrial processes. In addition, lessons from previous incidents were not shared, and it appeared that openness in the dissemination of experience from industrial accidents was not present in these industrial environments due to fear of losing business advantage, despite the lives that could be saved. [2]

Buncefield industrial disaster.
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The science

Two main areas of development have emerged in understanding major industrial disasters; communication of risk via effective management (including enforcement), [6] and understanding the physical mechanisms of the disasters. [8]

The AZF factory in Toulouse, 2001, had a catastrophic explosion, annihilating the entire compound and instantly killing 29 people. [9] The official investigation indicated that the explosion was the result of mislabelling, which led to compounds reacting that should never have been mixed, reacting. Research indicated that better management and improved land use surrounding the plant would have limited the extent of the disaster substantially. [1] This lesson on land use and disaster risk was also learned at Buncefield. [10] The Buncefield disaster [11] was unprecedented at the time, yet eventually it became clear that it was the result of an unrecognised explosive mechanism. [8] It became understood that the conditions of the spill allowed the formation of a vapour cloud that was confined in such a way by the plant layout that it exploded in a characteristic way; an Open Flammable Cloud Explosion. This mechanism has, in hindsight, been used to explain incidents in New Jersey, USA, and Naples, Italy. [8] This type of disaster at chemical storage sites needed to be addressed in the new generation of policies in the EU.

The independent scientific (engineering) assessments from incidents are the valuable means by which similar accidents can be avoided in future. [12] These reports often highlight problems from equipment to management, but often it has been found to be a mixture of these two factors. To ensure an improvement in safety standards, and a safer working culture for all employees, the empirical findings of these scientific investigations needed to be addressed in policies

The application to policy and practice

After the Toulouse and Buncefield incidents, the science indicated that the legislation for storage sites was insufficient, and so in 2012, the Seveso Directive III was set in motion. [13] The main targets for this change in policy included inspections, to check that the policies were being thoroughly implemented, and to broaden and tighten legislation around storage sites to help prevent future unprecedented disasters by effective and flexible planning involving both private and public entities. [6]

The development of Seveso Directive III, and thus the evolution of COMAH, is well under way, and ready for implementation in 2015. [14]

Did it make a difference?

As preparations for the new legislation continue, institutions have been receiving notices that they will have to make changes to their current practice to facilitate the next generation of chemical industry. [14] The Seveso Directive II did have an effect in Europe, with a significant reduction in the number of chemical accidents in the region, saving potential costs in lives, environment and finance. [6] The next Seveso Directive seeks to expand the current legislative capability by using the global chemical classification system, as this will allow the directives to be more easily understood in an increasingly globalised world. [6]

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