

More than 2500 people had to die and more than 200 000 had to be seriously injured in Bhopal, India, to preach once again the single lesson of high technology accidents: ***Accident avoidance is cheaper than paying repairs and compensation.*** It cannot often enough be repeated and should be displayed in all boardrooms from which high technology industry is controlled.

There is only one **Implacable Law** for all high technology Industry:

- Accidents are unavoidable, they are always unexpected and unpredictable.
- Plant maintenance must be at the highest level and no short-cuts tolerated.
- Plant operators in control must be highly trained in emergency procedures.
- Their status and their salaries must be in relation to their responsibilities.
- Back-up duplication and emergency power generators are mandatory.
- Only the most modern computer aided instrumentation can increase safety.
- Highly trained and often rehearsed rescue services must ever be on standby.

At Bhopal in Central India, on 3 December 1984, 35 tons of liquid methyl isocyanate [MIC] escaped as gas from a faulty Union Carbide storage tank in the middle of a large city. It was the most serious industrial accident of the chemical industry ever, and since the poison gas warfare at Ypres during World War I in 1918, nothing like it had ever recurred.

Methyl isocyanate is a highly reactive intermediate chemical with the low boiling point of 35 °C, used in the synthesis of the pesticide Sevin. Normally stored under refrigeration it can be safely handled, but according to Indian scientific reports, Union Carbide had introduced strict economy measures, refrigeration had been curtailed, staff had been reduced and faulty components had not been replaced. The deadly nature of the escaping gas was not at first realised and thus casualty figures mounted rapidly. In fact only after this accident was the biological danger of MIC investigated.

In my Editorial, ISR 10/3 published in September 1985, I stressed the need for high executives in the chemical, atomic and petroleum industries to make themselves acquainted with the great sums of money which had to be paid after previous accidents for compensation and for repairs. They would then realise that plant maintenance and adequate replacement stores, as well as good operator salaries, were cheaper and thus justifiable to the company's accountants.

On 3 December 1999, 15 years after the accident, a large, silent Memorial Service took place at Bhopal. I hope its lessons will never be forgotten!