Stationary WMD

Col H R Naidu Gade asks: can another Bhopal be avoided?

India's chemical industry is worth about $150 billion, ranking sixth in the world. One of the largest industrial sectors in the Indian economy, it is a big employment generator. The location of toxic chemical units close to population centres poses immense hazard to human beings, livestock, flora, fauna and the environment. The Bhopal gas tragedy in December 1984 still stands as the world's worst chemical disaster, causing as many as 15,000 deaths. Can we prevent it being repeated?

The industry comprises about 70,000 chemical manufacturing units – small, medium and large-scale units, making a wide range of chemical products which include pharmaceuticals (29%), petrochemicals (21%), speciality chemicals (19%), fertilizers (17%), agrochemicals (3%) and other base chemicals (11 %). As much as 80% of this chemical industry is located in the two developed western states of Maharashtra and Gujarat and in, or close to, the population centres of Mumbai and Vadodara.

The Industry is regulated by a host of federal and state agencies as regards licensing, safety, security, pollution control, environmental impact, imports and exports. The Indian Chemical Council is the industry association that works closely with the government bodies in guiding members to implement the above issues.

Vulnerabilities: hazardous chemicals

The essential elements of security in the hazardous chemicals (HC) Industry are: assessment of possible threats; vulnerability analysis; security counter measures required; and mitigation and emergency response mechanisms in place. The threats to the chemical industries could affect hazardous chemical facilities, hazardous chemical transportation systems, and cyber threats to microprocessor-controlled hazardous chemical process operations.

Any of these could be potential targets for deliberate actions by terrorists, criminals and disgruntled employees. The major external threat to a facility could be from terrorists, anti-nationals, and militants, with a clear intention to cause a large toxic release, explosions, and inflicting a large number of casualties. The internal threats could be from disgruntled employees, former employees, contractors, with the intention to cause economic damage or disruption in business activity rather than inflicting injuries to people.

Insider threat

The most serious threat could be from collaborative actions by insiders and external adversaries. The risks arising out of these threats are huge and must be assessed to determine adequate security measures required to be employed within the facility, including the domains of cyber security and chemical logistics.

The threats to a chemical processing industry could manifest in release of HC on-site causing fire; explosion and toxic gas dispersion; theft of HC for use off-site; major damage to the infrastructure of the plant; product tampering; theft of confidential information; and disruption of computer controlled equipment through cyber-attacks.

Vulnerability analysis

Vulnerability analysis (VA) determines the degree to which a facility or system is susceptible to hostile action. It involves identifying areas and realizing the credible threats assessed in the threat analysis. It is essential to be creative and imaginative in VA as the hostile elements may employ novel ways to strike facilities and systems. Vulnerabilities exist at each phase of chemical production, storage, transportation, and distribution, which may be exploited by the threat elements.

Therefore, the security countermeasures should cater to timely detection, delay, response and mitigation from any possible threats – and should encompass Information security, physical security, cyber security, and well-established security policies and procedures.

Site security planning

The US and Western nations have had ample experience with severe chemical incidents, and with the looming threat of chemical terrorism, chemical manufacturers and internal security officials have been striving to improve chemical sector-specific standards, laws and countermeasures.

> "Basically, these hazardous chemical facilities are stationary weapons of mass destruction spread all around the country."
>
> SEN. BARACK OBAMA, 2006

More advanced countries conduct 'Responsible Care' initiatives with stringent and verifiable chemical safety and security standards. These mandate each high-risk facility to carry out a Security Vulnerability Assessment intended to assess the likelihood that unintended consequences would be prevented, based on the security measures already in place at the facility.

Thereafter, these facilities are required to submit a site security plan (SSP) detailing planned security measures, both physical and procedural, intended to address identified vulnerabilities. These facilities are required to prove that they have adequately addressed the risks outlined by the risk-based performance standards in their site security plan.

After physical inspection of the facility, the SSP is approved and a deadline given for successful implementation of that plan.

India's chemical insecurities

India's chemical industry supposedly operates within elaborate and stringent safety procedures and processes that are periodically updated and upgraded. However, the record of physical compliance to these procedures by the industry is questionable – because of lax regulatory/supervisory bodies not carrying out their required functions well, and because most industry members compromise on safety and security in order to make quick profits by adopting shortcuts.

As of chemical security, the ubiquitous inadequacies mean the industry needs to walk a long mile. The terms 'safety' and 'security' are often mixed up and there is a misapprehension that facilities with good safety mechanisms in place are equally secure, which is not true.

In India, an emerging nation, chemical sector safety and security remain ➤

RISK-BASED PERFORMANCE STANDARDS PERTAIN TO:

Restricted-area perimeter; secure site assets; screen and control access; deter, detect, and delay; shipping, receipt, and storage; theft and diversion, sabotage, cyber, response, monitoring, training, personnel surety, elevated threats, specific threats, vulnerabilities, risks, report of significant security incidents, officials and organizations and records.

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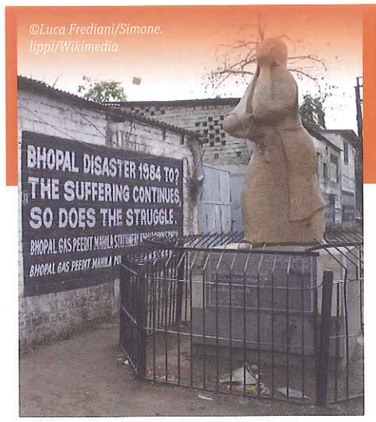

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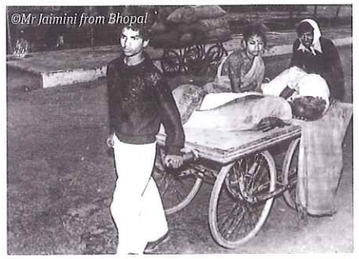
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LEFT (from top to bottom):

Memorial for those killed and disabled by the 1984 Bhopal disaster.

After the Bhopal disaster, municipal workers picked up 15,000 bodies with their bare hands, loading them onto trucks for burial in mass graves or to be burned on mass pyres.

Primitive security measures at a chemical plant in India.

woefully inadequate, and the facilities are vulnerable to terrorism and catastrophic failures. Hence there is an immediate need to address areas such as process safety, chemical incompatibilities, emergency response systems, integrated training and mock exercises among stakeholders, comprehensive hazard vulnerability assessments, adequate warning and notification systems, accurate risk communication and public information, and improved cyber and physical security measures. This would do much to avert, mitigate, respond to, and recover from industrial chemical sector disasters and their aftermath.

National Chemical Policy 2014

The draft National Chemical Policy 2014, which is yet to be approved by the Government, provides for creation of a National Chemical Centre (NCC). This is mandated to evolve, authenticate and issue chemical safety and security standards aimed at putting in place a robust framework, promoting safety and security of chemical facilities across the value chain – and disaster-resistant and resilient chemical industry operations.

The policy document aims for the NCC and its organs to strictly and holistically regulate the Indian chemical industry. Until such time the NCC comes into being and is fully functional, the Indian chemical industry will perhaps continue to follow the present ad-hoc and self-suiting security standards – thereby posing a great threat and risk to the people and the environment around.

The Bhopal disaster was a clear case of serious safety lapses and failed disaster responses. As safety and security are inter-linked, any breaches in the chemical facilities and the transportation chain would result in huge catastrophes causing immense human, animal, and environmental losses. The Indian government and the chemical industry must speedily address this huge ticking time bomb without further delays and vacillations – if they are to prevent another Bhopal-type catastrophe waiting to happen.

Right: After Bhopal: during decontamination of the plant in 2010, Tank 610 was removed from its foundation and left aside.

Below: This section of the MIC (methylisocyanate) plant at Bhopal is deteriorating decades after the gas leak.


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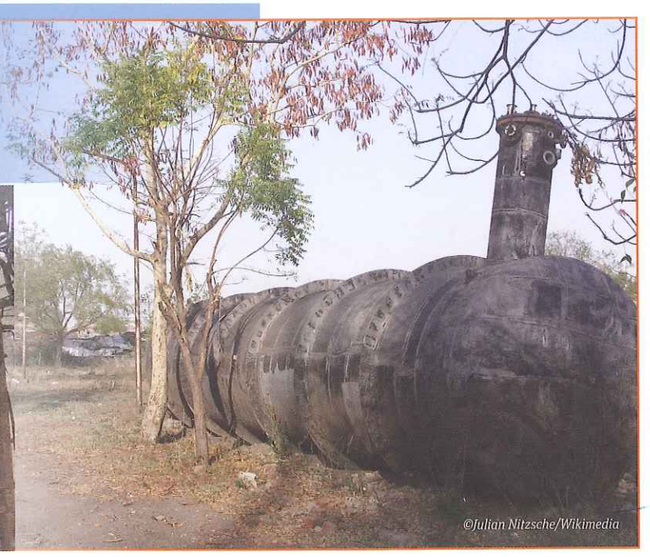
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