India and Chemical Security - Can Another Bhopal be Avoided?*

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Summary

The Indian Chemical Industry manufacturing a large number of Toxic Industrial Chemicals and materials, not well regulated, has shortcomings relating to the security of the plants and the chemicals. The security threat could be at the plant, at the storage and during transportation of chemicals by various modes. Lack of adequate measures, to ensure security, could have disastrous consequences resulting in a great loss to life and property.

"Basically, these hazardous chemical facilities are stationary weapons of mass destruction spread all around the country" - then Senator Barack Obama, 2006

Introduction

The Indian chemical industry estimated today to be about USD 180 billion value, ranking 6th in the world, is one of the largest industrial sectors in the Indian economy and a big employment generator.[1] 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%), specialty chemicals (19%), fertilizers (17%), agrochemicals (3%) and other base chemicals (11 %).[2] Gujarat and Maharashtra are the two states where the majority of the chemical industries, including small, medium, and large enterprises, are concentrated. Andhra Pradesh, Tamil Nadu, Karnataka and West Bengal also have some chemical industry presence. The Industry is regulated by a host of central and state agencies on various aspects related to licensing, safety, security, pollution control, environmental impact, imports and exports. Indian Chemical Council, the industry association works closely with the government bodies in guiding members in implementing the above issues. The location of toxic chemical units in close proximity of population centres pose immense hazard to human beings, livestock, flora, fauna and the environment in general.

Threats & Vulnerabilities - Hazardous Chemicals (HC) Industry

The essential elements of security in the 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 broadly be to: Hazardous Chemical Facilities; Hazardous Chemical Transportation Systems; and Cyber threats to microprocessor controlled Hazardous Chemical Process Operations. Any of these above entities could be potential targets for deliberate actions by terrorists, criminals and even 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, contractors, with the intention to cause economic damage or disruption in business activity rather than inflicting injuries to people. 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 to: 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 plant; product tampering; theft of confidential information; and disruption of computer controlled equipment through cyber attacks.

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

International Chemical Safety & Security Standards

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. Most advance countries in the world have 'Responsible Care' Initiatives with stringent and verifiable Chemical Safety and Security Standards. The Chemical Security Standards mandate each high risk facility to carry out 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. These standards pertain to aspects like 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. After physical inspection of the

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

Indian Chemical Industry Security - Status

The Indian Chemical industry supposedly operates within elaborate and stringent safety procedures and processes, 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 most industry members compromising on safety and security to make quick profits by adopting shortcuts. As of chemical security, the industry needs to walk a long mile revealing the ubiquitous inadequacies. The terms safety and security are often mixed up and there is a misnomer 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 woefully inadequate, and the facilities vulnerable to terrorism and catastrophic failures. Hence 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. That would do much to avert, mitigate, respond to, and recover from industrial chemical sector disasters and their aftermath.

The draft National Chemical Policy 2014, which is yet to be approved by the Government, provides for creation of a National Chemical Centre (NCC) mandated to evolve, authenticate and issue the 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. Additionally, the National Action Plan for Chemicals (NAPC) is being issued by the Ministry of Environment. Till such time the NCC comes in to being and is fully functional, the Indian Chemical Industry will perhaps continue to follow the present self-suiting security standards thereby posing a great threat and risk to the people and the environment around.

Conclusion

Bhopal gas tragedy of 1984, world's worst chemical disaster, was a clear case of serious safety lapses and failed disaster responses. Safety and security being inter linked, any safety or security breaches in the chemical facilities and the chemicals transportation chain would result in huge catastrophes causing immense human, animal and environmental losses. The Government and the Chemical Industry should speedily address this huge ticking time bomb without further delays and vacillations lest there would be another Bhopal type catastrophe waiting to happen.

Endnotes:

1. "Bright Future for Indian chemical Industry", KPMG, see https://home.kpmg.com/xx/en/home/insights/2018/03/pro-growth-environment-pays-off-for-indian-chemical-companies.html

2. "Indian Chemical Industry", FICCI, see http://ficci.in/sector/7/Project_docs/Chemical-Petrochemical-sector.pdf

* http://www.defensa.gob.es/ume/Boletin_nrbq/bibliografia_boletin_1/20170101_Stationary_WMD_xCBRNWx.pdf