



Agri Articles

(e-Magazine for Agricultural Articles)

Volume: 04, Issue: 04 (JULY-AUG, 2024)

Available online at <http://www.agriarticles.com>

© Agri Articles, ISSN: 2582-9882

Remembering Bhopal: The Legacy of a Tragedy

(* Kishore S.M. and Sujith K.M.)

Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Shivamogga

*Corresponding Author's email: kp464751@gmail.com

Bhopal, the capital of Madhya Pradesh in central India, is a historically rich and picturesque city. Despite being situated in a relatively impoverished region by Indian standards, it has a complex history intertwined with industrial tragedy. This story begins in 1968 when Mr. Arjun Singh, who later became the federal Minister for Human Resources and Development, was Chief Minister of Madhya Pradesh. He facilitated the relocation of the agricultural office of Union Carbide India Limited (UCIL) from Bombay to Bhopal, aiming to boost the state's development. In 1969, the UCIL plant in Bhopal was established initially as a formulation facility for Sevin Technical Concentrate, imported from the United States. By 1980, the plant had started manufacturing the pesticide Sevin using methyl isocyanate (MIC). However, tragedy struck merely four years later. On December 2, 1984, a catastrophic incident resulted in the release of 30 metric tons of highly toxic MIC gas from the UCIL plant. The impact was devastating: it's estimated that nearly 20,000 people lost their lives, and approximately 200,000 were exposed to varying degrees of the poisonous gas. Following the disaster, the UCIL plant ceased operations, and in 1999, Union Carbide became a subsidiary of Dow Chemical. The aftermath of the Bhopal tragedy prompted significant international attention and activism. Organizations such as the Sambhavana Foundation emerged to address the ongoing health and environmental challenges faced by the survivors. They operate a free clinic, conduct epidemiological and environmental research, and are working towards establishing a hospital. The Bhopal disaster serves as a stark reminder of corporate negligence, government shortcomings in regulating hazardous industries, and the profound humanitarian toll of industrial accidents. It continues to be a focal point for global discussions on industrial safety, corporate responsibility, and justice for the victims.

The Bhopal disaster epitomizes a catastrophic event of immense magnitude and profound impact

It was just past midnight of December 2, 1984. Nearly 30 of the 42 metric tons of MIC stored in Tank 610 of the UCIL pesticide plant escaped with considerable velocity within a matter of 45 minutes to 60 minutes. The dense cloud of the heavier-than-air gas soon settled on the shanty towns adjoining the plant showing no mercy to people, animals, and plants. The exact human death toll is still to be unknown; however, it is estimated that nearly 5,000 people died within 2 days, and the death toll eventually reached upward of 20,000. A total of 200,000 of 800,000 (1984 population) were exposed to the gas.

India and the world were shocked in the morning of December 3. This may be how the world will end not with a bang (with obvious reference to Nagasaki and Hiroshima) but with an ecological whimper," wrote Abu Abraham in Bombay's Sunday Observer of December 23, 1984 (p.1). "City of Death" was the front cover of the December 31, 1984, issue of the fortnightly India Today. "India's Disaster- The Night of Death" was displayed on the front cover of the December 14, 1984, issue of the Time magazine.

The fear was so great among the people of Bhopal that nearly one half the population left the city during Operation Faith (December 16 to December 22, 1984) when the remaining MIC in the plant was disposed off by making more of the pesticide Sevin.

The general sentiment was that it was an unfortunate accident, the probability of whose occurrence should be minimized ("Bhopal's Message," 1984; Diamond, 1985; Tcheknavorian-Asenbauer, 1984). Yet many felt that the Bhopal tragedy, terrible as it was, was the price to be paid for development, for the Green Revolution.

Union Carbide India Limited (UCIL)

Union Carbide India Limited (UCIL) was a subsidiary of Union Carbide Corporation (UCC), an American multinational chemical corporation. Here is a brief history of UCIL: Union Carbide Corporation (UCC) established Union Carbide India Limited (UCIL) in 1934 as a subsidiary to operate and expand its business in India. Initially focused on manufacturing batteries and chemicals, UCIL gradually diversified its operations in India, including the production of industrial chemicals and agricultural products. In the late 1960s and early 1970s, UCIL expanded its presence in India with the establishment of several plants across the country. One significant development was the relocation of UCIL's agricultural products division from Bombay to Bhopal in 1969, under the leadership of Madhya Pradesh Chief Minister Arjun Singh. The Bhopal plant of UCIL became notable for its production of the pesticide Sevin, which involved the use of methyl isocyanate (MIC) as a key ingredient. This plant, established in Bhopal in 1969-1970, would later become infamous for the devastating industrial disaster that occurred there in December 1984. On December 2-3, 1984, the Bhopal plant released approximately 30 metric tons of toxic MIC gas, resulting in one of the world's worst industrial disasters. The gas leak exposed thousands of people to the lethal gas, causing immediate deaths and long-term health effects for many survivors. In the aftermath of the Bhopal disaster, UCIL faced extensive legal and financial repercussions. The plant was permanently closed and Union Carbide Corporation (UCC) became embroiled in legal battles and settlements with the Indian government and the victims of the disaster. In 1994, UCC sold its shares in UCIL, and in 2001, UCC itself was acquired by The Dow Chemical Company,

Gas leak, Faulty Location, Careless Handling of MIC

Leak: The catastrophic events of December 2, 1984, at the Union Carbide India Limited (UCIL) plant in Bhopal were triggered by a critical error during cleaning operations. A small amount of water inadvertently entered MIC Tank 610, initiating a highly exothermic reaction with methyl isocyanate (MIC). This reaction generated intense heat, causing the liquid MIC to rapidly vaporize and exceed the containment capacity of the tank. As pressure built up beyond safety limits, the tank's safety mechanisms failed, leading to a catastrophic rupture of the venting system. This released a massive amount of toxic MIC gas into the surrounding atmosphere. Contrary to claims of sabotage by disgruntled workers, the sequence of events clearly points to an industrial accident exacerbated by operational oversights and inadequate safety protocols. The tragic consequences underscore the critical importance of stringent safety measures and rigorous adherence to operational procedures in preventing such disasters in industrial settings.

Faulty Location: The UCIL plant in Bhopal was situated just one kilometer from the railway station and three kilometers from major hospitals like Hamidia and Sultania, in defiance of established urban planning guidelines. As early as August 25, 1975, the Bhopal Development Plan had cautioned against locating "Obnoxious industries," such as pesticide and insecticide manufacturing, within city limits. M. N. Buch, then commissioner and director of town and country planning for the state, had specifically directed Union Carbide to relocate its carbamate manufacturing away from residential areas due to the significant risks involved.

Despite these warnings aimed at safeguarding public health and mitigating hazards, the proximity of the UCIL plant to densely populated areas contributed to the tragic outcomes of the Bhopal gas disaster in December 1984. This situation underscores the critical importance of adhering to urban planning regulations and prioritizing public safety in industrial siting Decision.

Care less Handling of MIC: MIC was stored in three tanks at the Bhopal plant, each with a capacity of 15,000 gallons. Typically, one tank is reserved for emergencies, leaving two in active use. However, Tank 610 in Bhopal deviated from safety norms: it contained 87% of its capacity, far exceeding the recommended 50% in the United States and 60% in Bhopal. Prior to the tragic incident, Tank 610 held 6.4 tons of MIC, to which more MIC was added between October 7 and October 22. This prolonged storage of MIC, totaling 55 days, included two separate batches within the tank.

Failure of Safety Devices: The scrubber and flare tower, which at their best could handle minor leaks, were non-functional at the time of the accident. The scrubber, if functional, can neutralize MIC entering at 90 kg/hour at 35°C and a maximum pressure of 15 pounds per square inch (psi); the pressure at which MIC escaped was approximately 200 times higher at 6 to 10 times the desired temperature. The third main safety device, the water spraying system, was functional and turned on at 1:00 AM in the morning of December 3; however, it could shoot water only upto a height of 12 meters to 15 meters whereas MIC escaped at a height at approximately 50 meters.

Shoddy Maintenance: Serious operational deficiencies plagued the UCIL plant. It abandoned the practice of hiring degree holders as operators with six months of training, instead employing high school graduates transferred from other facilities. Staffing was drastically reduced, from 12 operators, 3 supervisors, 2 maintenance supervisors, and 1 superintendent per shift to just 6 operators and 1 supervisor, with no mandatory superintendent. The plant lacked automated systems to detect leaks, relying instead on workers to notice symptoms like eye and throat irritation. There was also no effective public warning system; alarms used were indistinguishable from those used for routine purposes. These lapses in operational standards significantly contributed to the severity of the Bhopal gas disaster in December 1984.

Conclusion

The Bhopal gas tragedy stands as a somber testament to the devastating consequences of industrial negligence and the urgent need for stringent safety measures and corporate accountability. The events of December 1984 in Bhopal, where a deadly gas leak from the Union Carbide India Limited (UCIL) plant claimed thousands of lives and affected countless others, have left an indelible mark on history. Decades after the tragedy, the quest for justice and restitution for the victims and their families continues. Organizations and activists tirelessly advocate for the rights of those affected, pushing for comprehensive healthcare, environmental remediation, and fair compensation. The Bhopal disaster serves as a stark reminder of the profound responsibilities that corporations bear towards the communities in which they operate. It underscores the critical importance of robust regulatory frameworks and transparent oversight to prevent such tragedies from recurring. As the world reflects on Bhopal, it reaffirms the global commitment to ensuring that industrial development is pursued with utmost care and accountability, prioritizing human safety and environmental protection above all else. The lessons learned from Bhopal must guide us towards a future where tragedies of this magnitude become unthinkable, and where justice and compassion prevail in every aspect of industrial practice.