

Union Carbide and the Bhopal Disaster

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Introduction

This is the story of the world most devastating industrial disaster. Nearly Twenty five years ago an American owned factory spewed poisonous gas on a densely populated Indian city, killing 8000 people and over 200,000 thousand injured. This paper is the story of why it happened and how it could have been avoided. It's a story of betrayal and an American dream that turned into an Indian nightmare with a terrifying legacy. Union carbide a great American corporation, in the 60's and 70's promoted a dream to feed the world's hungry million's by developing pesticide to protect crops (Bisarya 2005).

Union carbide decided to pursue this dream in the vast and lucrative densely populated Madhya Pradesh province in Bhopal, India for their new product methyl isocyanate gas and formally known as MIC and registered trademark "Sevin". MIC is an organic compound and is an intermediate chemical in the production of pesticides. Its molecular formula is C_2H_3NO and maybe manufactured from monomethylamine and phosgene. Some brands of cigarettes also contain about 4ug/cigarette MIC in the Tobacco smoke. Its physical properties are a colorless, lachrymatory (tear gas) and a sharp-pungent odor that vaporizes and which has relatively low boiling point ($39.1^{\circ}C$) and also is soluble in water (Dhara, V 2002).

In the 70's the government of India initiated policies to encourage foreign companies to invest in its industry and asked the American giant to build a production plant to manufacture "Sevin". The production plant was zoned for light industrial and commercial use. With immense decreased demand for pesticide, the production plant was only operating at a 25% production capacity when the incident occurred. With the decreased demand Union Carbide directed the plant to be closed and prepared the plant for sale (Peterson M.J.). However with no readily available buyer the production plant continued to operate under its health and safety means. Also Madhya Pradesh local government knew of the safety concerns however was unforthcoming to place burdens on the production plant because of the struggling economy and loss of an American giant corporation at the time (Peterson M.J.).

Time of Events

While most American's were getting ready for lunch, nearly all of Bhopal's one million residents were sleeping at 10:30AM (11:00 PM Bhopal, India). According BBC, Ryman Khan was cleaning the pipes with water which lead to the MIC storage tanks. Although a routine function for Ryman Khan, Union Carbide failed to provide a vital instruction which would have directed him to use a small piece called a slip blind. A slip blind is a flat, round piece of metal that fits between two pipe flanges to stop the flow of water in its line if there are any leaks in the pipe valves. Water which can create a violent reaction to the MIC chemicals,

raised the temperature where the catastrophic chain of event started. As the pressure and exothermic reaction increased inside the MIC Storage tank, a refrigeration unit which served as another safety precaution to cool the MIC storage tank had been drained of coolant for use in another part of the plant and is the first of four safety systems that would have avoided the catastrophes. A second safety system, a gas vent scrubber could have helped to neutralize the toxic discharge from the MIC tanks however it had been placed on standby. The third safety system which went off and had failed is the alarm which had been turned off by the plant managers because they did not want to fear the residents. The fourth safety device which would have worked is by burning off the gas that had escaped however the gas flare tower was not working and has not worked for three months before the catastrophe, a sign Union Carbide overlooked safe precautions (Peterson M.J.).

Aware of the catastrophe that had occurred in Madhya Pradesh province, Executives at Union Carbide Corporation had begun efforts to dissociate its American counterpart from its Indian subsidiaries, Union Carbide India Limited (UCIL) for gas leak responsibility. Their foremost tactic was to fault the UCIL, stating that the plant was built by the Indian subsidiary. Union Carbide Corporation in America also went to lengths to fabricate scenarios involving Sikh extremist groups and discontented its own employees (Peterson M.J.).

Aftermath and Health Affects

In the aftermath of the poisonous cloud on December 7th 1984 a multi-billion dollar lawsuit was filed. The American attorney who had filed the case in U.S. Court was the first beginning of decades of legal fractions. Ultimately the legal fractions were moved from the U.S. Courts and placed under Indian Jurisdiction to compensate those affected and injured. The Indian Supreme Court arbitrated a settlement with Union Carbide Corporation for a lump sum of \$470 Million which was to be distributed to the claimants as a full and final settlement. According to the BBC the average amount paid to the families of the dead was only \$2,200. In preceding cases, Union Carbide Corporation made every effort to manipulate and withhold of scientific data to deter those affected. Today the company still has not made public of the exact composition of the poisonous plume cloud. In 1984 the Union Carbide Corporation was worth \$10 billion dollars more than what it's worth today and currently operates under DOW Chemical (Union Carbide, Peterson M.J.).

Also as a further insult to Bhopal, India, Union Carbide Corporation discontinued investment operations following the tragedy and has also failed to clean up the industrial site completely. The production operations center continues to leak poisonous chemicals and heavy metals. The simplistic of all necessities, water, has to be shipped because these poisonous chemicals have found their way into local water aquifers. One of the principal legacy's that has been added to this Bhopal incident is that the water is so dangerously contaminated and has been left by the company for the people of Madhya Pradesh to clean up (Peterson M.J.).

The exothermic reaction triggered numerous short term health and long term health effects for the people of Bhopal. The poisonous plume cloud was principally composed of materials that was denser than the surrounding air consequently stayed close the ground, affecting children that went running through some of the densest patches. Pregnant women amidst the devastations suffered convulsions and extreme stomach pains. Many women ended up miscarrying. As the gas cloud continued to set in individuals struggled for air, vomiting violently, and their eyes burning. MIC breaks the walls of the lungs causing people to ooze

white foam from their mouth causing many to drown in their own bodily fluids. Other deaths were caused relexogenic circulatory collapse and pulmonary oedema. After autopsies were performed, the tragedy revealed the changes to the lungs, cerebral oedema, tubular necrosis of the kidneys, fatty degeneration of the liver and necrotising enteritis (Willey RJ, 2006). Stillbirth rate increased by 300% and neonatal mortality rate also increased by 200%, amidst the gas leak ("Health Effects of the Toxic" 1994).

Long Term Health Affects and Warren Anderson

Today in Bhopal there is abnormal skin, lung and gastro intestinal cancer increases. The women in Bhopal continue after decades to have serious menstrual problems. Miscarriages in are seven times higher than the national average according to BBC. Many of today's children have genetic defects and the survivors continue to suffer from poor coordination, memory loss, pyrolysis, partial blindness and impaired immune systems. Scientific estimates say 100,000 to 200,000 people have reported symptoms, including cardiac failure secondary to lung injuries, female reproductive difficulties and some women have been known to not have periods until age 20. In 2002 Greenpeace found a number of toxins still present in nursing women's breast milk. According to BBC currently estimates show that one person perishes everyday from the effects of the gas (Steve Condie, 2004).

A wildly known documented mother and a father who worked at the Union Carbide Corporation plant, Chand Bi, a maintenance worker came home just after dawn of the devastation only to find his wife, a mother of three, had been exposed to the poisonous gas for four daunting hours. Meehboob, Chand Bi's wife is nearly blind after the incident. Unable for Meehboob to see, the baby in Meehboob arms has perished. The picture below depicts the statue that was built in recognition of this gloomy disaster and the mothers story ("Union Carbide").

Warren Anderson, Union Carbide Corporation CEO in 1984 was arrested and released on bail by the Madhya Pradesh Province police in Bhopal, India on December 7th 1984. In 1987 the government of India summoned Anderson as well as eight other executives and two company affiliates with homicide charges and to appear in court. Union Carbide Corporation recoiled saying that the company is not under Indian jurisdiction and were no shows. The local authorities charged Mr. Anderson with manslaughter, a crime in India that holds a maximum of ten years in prison. Warren Anderson retired from Union Carbide Corporation in 1986 and was declared a fugitive from the Chief Magistrate of Bhopal on February 1st, 1992, for failing to appear in court hearings in which he was a chief defendant. The government of India submitted paper work for the extradition of Warren Anderson however the United States declined the extradition of Mr. Anderson. Union Carbide Corporation has shrunk to one sixth of its size since the disaster in Bhopal in an effort to restructure itself and dissociate itself. The Union Carbide Corporation currently operates under the ownership of Dow Chemicals and still states on its website that the Bhopal disaster was "cause by deliberate sabotage" (De Grazia A 1985).

Conclusion

The catastrophe in Bhopal India has changed the nature of the chemical industry and has caused a reexamination of the necessity to produce such harmful chemicals. However the lessons of Bhopal have not changed the agricultural practice patterns and the use of pesticides and it is estimated that three million people per year suffer from pesticide poison mostly in developing nations.

The tragedy of Union Carbide Corporation in Bhopal India continues to be a warning sign for large corporations doing chemical business in developing countries. Bhopal and its aftermath was a warning that the path to industrialization, for developing countries is oppressed with human, environmental and economic liabilities. The government of India has offered some protection to public health with the establishment of the MoEF. The economy of India has seen remarkable growth however at a significant cost to environmental health and public safety. Much more could be performed in developing countries for community health in the context of industrialization safety to show that the lessons of Bhopal and the countless thousands who have perished in the midst of the horror that December 3rd night at 1AM in 1984 could have been prevented.

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