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**“...the struggle of man against power is the struggle of memory against
forgetting.”**

-Milan Kundera (The Book of Laughter and Forgetting)

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Introduction

The industrial catastrophe that occurred on the midnight of December 2, 1984 at Union Carbide India Limited pesticide plant in Bhopal, India was the worst industrial accident in the world. The official count was around 3000 deaths, but unofficial estimates are around 8000 – 10000 deaths (Bogart, 1989). Since then, a report in NY Times indicates the death toll has reached a high of 14,410 due to the chronic diseases caused by the gas leakage (NYT, 08/02/2002). This is a complex case, involving critics from all sides accusing the Government of India, U.S. Government, and Union Carbide and the workers that handle the case. The purpose of examining this case for this class, about Environmental Law is due to the fact that this involves a large-scale environmental pollution accident and the legal difficulties in international prosecution laws, extradition treaties and non-uniform regulations across countries which could be exploited by companies. This paper, as the title suggests examines the social, environmental, legal and economic aspects of this evolving tragedy.

History of the Accident

However tragic the circumstances turned out to be, the opening of the pesticide plant in Bhopal was well meant. The period was before Green Revolution. India was plagued with periodic droughts which resulted in famine. After centuries of British rule and mismanaged kingdoms before that, India was reduced to poverty level subsistence existence for 75% of its citizens. After partition there were two droughts and subsequent famines in the Northeastern part of India. This brought the world's attention to this region. Several research projects later, drought resistant varieties of wheat originally from the Sonora region of Mexico was developed to adapt to Indian conditions This wheat variety had bigger inflorescence, were resistant to rain and wind. This however required higher fertilizer application and had higher pesticide requirement. The Government of India began approving pesticide factories all over India, and thus the pesticide factory in India was opened in Bhopal, Madhya Pradesh in 1969 (Morehouse

and Subramaniam, 1986). This plant produced the pesticide carbaryl, also called as Sevin (Kurzman, 1987). The first intermediate product in this process was phosgene, which was produced from the reaction of carbon monoxide with chlorine. Phosgene in turn reacted with monomethylamine to produce methyl isocyanate (MIC), the deadly gas that was reason for the Bhopal tragedy. MIC was reacted with alpha-naphthol to produce carbaryl. MIC is highly combustible therefore it was kept under a blanket of nitrogen in two storage tanks in the Bhopal plant. This storage location on site of the factory was ill-advised since the factory was located among densely populated areas (Morehouse and Subramaniam, 1986). This location was rejected by the municipality authorities of Bhopal, but then the Central Government gave approval. By the malfunctioning of the valve, on the night of December 2nd, 1984, water got into the storage tanks, and reacted with nitrogen and thus the blanket gone, MIC leaked out. Within 2 hours the storage tank was empty.

The reaction was catastrophic. The gas leaked over the city, carried by the wind into the shantytowns where squatters were living, into residential areas where working people and wealthy were living, to the railway station, where at least 200 people were found dead lying on the platforms. The wind carried the cloud to a vast area of almost 40 sq km. The next morning, several thousands were discovered lying dead on the streets of Bhopal, with post mortems revealing highly necroses lungs, and filled with fluid and in some cases holes appeared in the lungs due to the reaction with MIC (Morehouse and Subramaniam, 1986). The side effects continue even today (Greenpeace International, 2002). To date, they claim 20,000 have died and 150,000 are chronically ill and clean up efforts are not up to date. "...Communities around Bhopal drinking water is still contaminated. Women are having gynecological problems and are giving birth to babies that have birth defects. Eighteen years later, the plant location, which was subsequently abandoned, still has stockpiles of hazardous wastes and obsolete chemicals." India Today, in its February 15th, 1985 issue writes, "...the dead may not have been so unlucky after all. Their end came horribly; it is true, choking on air that had suddenly gone vile. But at least the nightmare was brief. And then it was over. For those who survived the poisonous methyl isocyanite leak from the Union Carbide plant, release will not come so quickly. Thousands of seriously affected survivors have

suffered such extensive lung damage, that they no longer can apply themselves physically. Their vision often gets blurred, spells of dizziness overtake them and walking briskly even for a few minutes sends them gasping to their knees, their chests aching. There are women who have peculiar gynecological problems. And there are others—particularly children—who keep reliving those hours over and over again.”

In the few years preceding the tragedy, the Union Carbide India Limited (UCIL) was losing money. During that period, safety and maintenance were given lowest priority in an effort to turn the plant around. In October 1982, there was an incident in which a mixture of MIC, chloroform and hydrochloric acid escaped from the plant (www.geocities.com/Athens/Forum/8266/Bhopal-2.htm), but in spite of the insistence of carbide officials for safety precautions, none were taken. Between one third of engineers and trained specialists who were at the plant since its inception, left for better jobs elsewhere before the accident.

The issue of danger and relocation of the plant when posed in the Madhya Pradesh State Government assembly in December 1982 was dismissed by an official as “.... A sum of Rs. 25 crore has been invested in this unit. The factory is not a small stone, which can be shifted elsewhere. There is no danger to Bhopal, nor will there ever be.” Also on the night of the tragedy, when Bhopal police was desperately hunting down an official, was thus answered by Mr. J. Mukund, carbide’s work manager, “The gas leak cannot be from my plant, the plant is shut down for repairs. Our technology just can’t go wrong.”

Several factors were identified by Lloyd-Jones, Shah and Chawla (1996) as the contributors to the disaster. They were:

- Gradual erosion of good and regular maintenance operations.
- Depletion of adequately trained professionals, especially in supervisory posts
- Declining inventories of vital spare parts
- Staff exodus and demoralization
- Under-manning of important workstations in the plant

These factors and the problems mentioned above combined together to create the catastrophe on five past midnight on December 2nd, 1984.

Social Aspects of the Tragedy

Before analyzing the legal and environmental aspects of the tragedy, it is important to note the problems in establishing a factory in an industrializing country. India, by far, still a poor nation in 1984 is an ancient culture, with its evolved set of norms and traditions. Worst of all is the caste system; in which majority of people belong to the group of lower castes and untouchables. The untouchables are the most downtrodden of them all. Since the factory started in Bhopal, people belonging to such communities began migrating from villages towards the factory and began squatting in adjoining land, doing small businesses and working in odd jobs or as servants in the employee's houses. These areas developed as shantytowns and were the first affected during the tragedy. The delay in reactions to the tragedy may have been contributed by the fact that the majority of the victims were people from these communities. The class actions in Supreme Court representing the victims were also affected due to this factor. Union Carbide India Limited could hire the best of lawyers. How could the poor, uneducated people afford the best? Also even the distribution of compensation was affected by the rampant corruption in the Indian bureaucracy. Even the Rs. 10,000 (250\$) set aside for the victims families were not properly disbursed. Even the decision of agreeing to the 470million \$ settlement by the Government of India, acting as victims representative, was not made by prior consultation with the victims. Dominic Lapierre in his book *Five Past Midnight in Bhopal* (2002) gives an account of a New York lawyer promising 100 million rupees to the meeting of victims, most of them who earned Rs. 300 (less than 20\$), quote them as jubilant. After many years while researching for the book, he encounters the same couple, who had not received much compensation, and asking for "at least an apology from Union Carbide."

The unique social system of India and its ramifications contributed to the toughness of the relief and rehabilitation operations. The problems were exasperated with the change of Western and Eastern methods of thinking, work ethics and lifestyles. There was a lack of co-ordination from the parts of Union Carbide officials in India and Danbury (where the global HQ of Union Carbide was located) in handling of operational details of the plant, handling of its maintenance and security. This is especially important

because there was an accusation of sabotage of the valve by a disgruntled employee, but the details were never proven.

Economic Aspects of the Tragedy

According to various value-event studies published after the tragedy (Salinger, 1992; Marcus et. al., 1991), the abnormal return of the Union Carbide stock increased after the lag of just a month. This lag might not have contributed by the catastrophe, but previous events prior to the tragedy such as profits for the corporation dropping and several takeover bids (Salinger, 1992), for example a failed takeover bid by GAF. The increase in the stock prices was explained as a result of restructuring and recapitalization of the company before the sell-off.

According to a study published in Journal of Management Science (Marcus et. al. 1991), stock prices respond positively to defensive activities by the management, rather than accommodative moves by managers towards the victims. This explains how managers while trying to deflect lawsuits suppress their personal human reactions towards tragedy and try to deny all responsibility (Marcus et. al., 1991). This may serve to answer the question where the Union Carbide officials accused sabotage by a disgruntled employee or attack by a “Sikh terrorist”. By accommodative signals, as the settlement of 470\$ million, the shareholders see this action as an acceptance of responsibility to the tragedy and the acceptance of problems within the company and the stock reacts in a negative way (Marcus et. al. 1991), but they could not reject their null hypothesis (H_0 : When a company is involved in an accident, its investors will react more positively to defensive signals than to accommodative signals).

The Dow chemical company successfully took over Union Carbide in February 6th 2001, after that Union Carbide became a wholly-owned subsidiary. Dow owned all the stock of Union Carbide, but UC remained a separate entity. Thereafter Dow claimed that the stockholders and the Union Carbide did not have any responsibility in the tragedy (www.bhopal.com/position.htm). The details about this statement are explained in the next section in depth.

Legal Aspects of the Tragedy

The legal aspects of this tragedy make the bulk of my research. This case involves complex proceedings and legal toss rounds between India and US.

In the months following the tragedy, the Government of India appointed itself as sole representative of the victims for any legal dealings with Union Carbide Corporation (UCC) for processing of compensation by the Bhopal Gas Leak Act of 1985 (Lloyd-Jones, Shah and Chawla, 1996). With this consolidation of power, the Government of India filed a claim suit against Union Carbide for compensation and damages in the United States District Court in the Southern District of New York. The decision to bring the case in US was due to the fact that Indian Courts did not have jurisdiction over UCC, the parent company, which is a defendant in this case. UCC appealed on basis of *forum non conveniens* (forum not convenient), basis on the plaintiff's lack of standing to bring the suit in United States and the purported lack of authority of the lawyers employed by them to represent them (The Union of India v. Union Carbide Corporation, US Court of Appeals for the Second Circuit, January 14th, 1987). The Judge John F. Keenan dismissed their actions on basis of *forum non conveniens* based on certain conditions.

The conditions were that UCC:

1. consent to jurisdiction to the Courts of India and continue to waive defenses based on statute of limitations
2. agree to satisfy any judgment rendered by an Indian court against it and upheld on appeal, provided the judgment and affirmance "comport with the minimal requirements of due process,"
3. Be subject to discovery under the Federal Rule of Civil Procedure of the United States.

Judge Keenan, on delivering the judgment states, "... The Indian judiciary was found by the court to be a developed, independent and progressive one, which has demonstrated its capability in circumventing long delays by devising special expediting procedures in extraordinary cases such as by directing its High Court to hear them in a daily basis, appointing special tribunals to handle them, and assigning daily hearing duties to a single judge." However one factor Judge

Keenan found was that according to the Indian legal system parties were allowed discovery, however it is limited to what is admissible in trial. This he thought might limit the victim's access to the sources of proof. Therefore he ordered Union Carbide should consent to discovery of it in accordance with the federal rules of civil procedure after the cases were transferred to India. He added, "While the court feels that it would be fair to bind the plaintiffs to American discovery rules, it has no authority to do so."

Both Union of India and UCC appealed. This appeal was heard in the United States Court of Appeals for the Second Circuit and Judge Mansfield while affirming the dismissal on basis of *forum non conveniens* said that Indian courts were in a superior position to construe and apply the Indian Laws and standards than would the courts of United States, witnesses and sources were almost entirely located in India and all the records were kept in India.

In India, Union of India filed suit against Union Carbide in the Supreme Court of India and in a judgment delivered on February 15th 1989, approved a settlement of \$470 million dollars, upon which all litigations, claims, rights and liabilities related to and arising out of Bhopal disaster was also considered settled.

Subsequent suits files in Texas courts and New York courts by individual plaintiffs, particularly a Sajida Bano, accuse Indian Government of agreeing to the settlement without informing the plaintiffs, of unacceptable conflict of interest as part owner (40% shareholding), of inadequate representation because they could not opt out of settlement. These lawsuits were subsequently dismissed.

Supreme Court of India in 1990 revised its standing that criminal proceedings were not applicable in case of UCC, but the defendants did not show for the proceedings, and later (2001) a US court (Court of Appeals for the Second Circuit) affirmed that there was nothing in the settlement agreed to by Union Carbide Corporation that it was willing to face criminal proceedings. Another charge by the plaintiffs was that hospital which was promised by Union Carbide to be built was never built, but it never went through. Again, the court reaffirmed the judgment that the hospital was not a part of the settlement, hence the court could not force Union Carbide to build it.

Criminal charges proceedings against Mr. Warren Andersen, the chairman and CEO of UCC at the time of the disaster, were filed in Bhopal district court, and Bhopal district court ordered Mr. Warren Andersen to stand trial. In a sudden development, in May 24th, 2002, Central Bureau of Investigation (India's equivalent to FBI) appealed that charges be reduced from "culpable homicide" (legal equivalent of manslaughter) to negligent act, but the Bhopal court dismissed the appeal and ordered extradition proceedings against Mr. Andersen.

Mr. Soli Sorabjee, (www.bhopal.com/opinion.htm) Attorney General for India claimed that this will not stand against the Indo-American extradition treaty due to lack of certain evidences for proof of "probable cause" required by U.S. law. The links were:

1. The actual cause of gas leak is yet unproven
2. Mr. Andersen lacked knowledge of the gas leak prior to the accident
3. The limited extend of Mr. Andersen's' decision-making control over Union Carbide India Limited
4. Mr. Andersen did not refuse to correct the hazard
5. State Department would find policy reasons not to surrender Mr. Andersen due to
 - a. him being 81 years old and state of health
 - b. 17 years had elapsed between the tragedy and Government of India's decision to make a formal request for extradition.

As of the latest (March 5th, 2000) according to New York Times, Mr. Andersen has gone in hiding and is still classified as "absconding" by the Indian Government.

Environmental Aspects of the Tragedy

Several residual environmental aspects still linger in Bhopal, 17 years after the tragedy. According to a study conducted by Greenpeace (www.greenpeace.org) the continued contamination of the groundwater, soil and breast milk present a serious health threat not only to those currently exposed but also to future generations. According to experts, the evidence suggests that the toxics have not only moved across various mediums, but tropic transfer of these chemicals, essentially through the food chain,

causes these toxics to become part of the body burden. On one hand, Greenpeace continue to contend that Dow chemicals are lagging in the cleanup efforts of the Bhopal area, on the other hand Dow Chemicals claim that it has no responsibility.

Laxmi Murthy (<http://www.boloji.com/wfs/wfs0001.htm>) claims, "The post-Bhopal era also saw worldwide regulation on chemicals and toxicity and a demand by communities to the right to information and to be participants in the process of industry-siting. Yet, as Tomas Mac Sheoin's report on the Union Carbide Corporation notes, "It is one of the bitter ironies of Bhopal that its major reformist effects were felt in Union Carbide's home country." Inspired by the disaster and the public response to it, the US increased its regulatory activities. One major step forward came through the setting up of the Toxic Releases Inventory and other freedom of information measures that greatly increased public access to information on toxic chemical releases.

In India, however, community struggles have little success in gaining the 'right to know' whereby people can identify any contaminated sites in their areas. ". The legal system in which the resident is informed of the problems in that area is still in its infancy. In addition, majority of people in the catastrophe area are poor and uneducated they are not aware of the problems that are caused by exposure to toxic remains in the site. Most residents are not aware of the contamination of ground water in the area. Others, even though aware of the contamination, continue to consume it because the government has not provided any alternative sources of potable water.

A recent article by a web news service in India claims (<http://in.new.yahoo.com/030216/2178w>.) that around 700 tons of toxic waste in the form of corroded metal and other scrap generated by Union Carbide now lie scattered and exposed in the factory premises and have worsened the sufferings of victims living nearby.

A Greenpeace scientific study in 1999 and some others by government agencies have confirmed the presence of several life-threatening poisons such as mercury and other heavy metals, chlorinated pesticides and pollutants in the scattered waste.

The Greenpeace study, which also analyzed groundwater samples from the sources residents around the factory now use, revealed toxic pollutants, some of which were carcinogenic. These have been related to the chronic illnesses suffered by the residents some of which were enumerated in the beginning.

The investigation once found more than 20 tones of hexachlorocyclohexane in sacks lying in an open shed in the abandoned factory. HCH is a persistent organic pollutant and an environmental poison linked to immune-system and reproductive disorders.

According to a study conducted by the National Environmental Engineering Research Institute (NEERI), Nagpur, the factory area recorded a high concentration of toxic wastes, indicating the possibility of contamination at "higher depths". Groundwater contamination is still to be examined at this point of time.

These facts and figures notwithstanding, the entire political class of India has been indifferent to the people's demand for clean water and cleaning of the factory site and compensation for the victims.

The indifference is more glaring as Madhya Pradesh's Congress chief minister Dig Vijay Singh has been honored for being a "green chief minister".

BJP's (opposition party) Uma Bharti, representing the Bhopal parliamentary seat, is itching to oust Digvijay but she seldom takes up the cause of gas victims.

On Friday (April 4th, 2002), a call attention motion was moved in the State Assembly, but the person who moved it was absent as also most MLAs (member of Legislative Assembly, equivalent to state senator in US) from all parties. The discussion that followed took place without quorum, with dozen-odd legislators struggling to stay awake.

The Bhopal Gas Peedit Mahila Udyog Sanghatan (Women's Organization of Bhopal Victims) is now planning to move court against the "conspiracy of silence".

According to gas victims' campaigner Abdul Jabbar, politicians, including minister in charge of gas relief and rehabilitation Arif Aqueel, the Bhopal municipal authority and

Union Carbide would be made parties to the proposed case for letting life-threatening toxins lie scattered around the factory.

Residents of Atal Ayub Nagar, Arif Nagar, Chola and other slums have little choice but to drink the contaminated water as the only other source of water — provided by the Bhopal Municipal Corporation — is erratic in supply.”

The Bhopal Tragedy prompted the Indian Government to require Environmental Impact Assessment statements for any central approval of projects for emission or effluent standards. The statements are required to be prepared by committees should contain expert analysis from disciplines in eco-system and water resource management, air and water pollution control, flora and fauna conservation, land-use planning, social sciences, ecology and environmental health. Public hearings were also required as pre-requisite for project clearance. The measure also provides for a manufactured product to receive certification as environmentally friendly or compatible (www.worldbank.org/nipr/india/india-back.htm). Several dam projects (Silent Valley, Narmada Power Plant project) have run into road blocks due to these requirements.

Union Carbides’ Standpoint

In a website search conducted from Google, I ran into a website created by Dow Chemicals, called www.bhopal.com, where the company had explained what it had done for the victims of Bhopal and had answered several key points raised repeatedly by Greenpeace and other organizations. I have chosen several salient points from their assertions. These are view points in question answer format.

1. Union Carbide built, owned and operated the Bhopal plant.
 - A. Built, operated and owned by UCIL (51% UCC share, 40% Indian Government and rest private citizens of India).
2. Internal documents provided by Union Carbide in 2002 in connection with litigation contain “fresh evidence” of company’s wrongdoing and contradict the company’s earlier claim.

- A. Likely that the documents were in the Indian Government's hands for many years since the Government confiscated all the documents from Indian facilities after the disaster. None of documents contain any information that has not been expressed by Union Carbide and supported by US Courts.
3. "Unproven technology" was used in the plant that included safety risks
- A. None of the technologies were in use during the time of the disaster, never used or taken out of use by incident. The risks were profit associated, not safety risks.
4. A Union Carbide team warned of the tragedy
- A. None of the safety issues raised by the team would have had an impact on gas leak.
5. The environmental standards at the Bhopal plant were inferior to those of Union Carbide's plant in Institute, West Virginia.
- A. Indian facility standards were superior to those of Virginia plant due to the fact that previous experience from the older Virginia plant was incorporated in the design of the plant. EIA ratings gave higher ratings to Bhopal in wastewater and carbon monoxide emissions and same ratings for potential effects on human health.
6. The plant caused contamination of groundwater and soil outside the plant site with Union Carbide's knowledge.
- A. Contamination caused by archaic drainage system of the city rather than from the plant.

Results and Conclusions

This paper was primarily written by me as a means to understand the legal ramifications of increased global co-operation and trade in the world. Being an Indian, I wanted to know what the story was behind the tragedy and subsequent processes. The first reaction that was provoked in me was extreme sympathy for the victims and corporate wrongdoing against powerless third-world victim. But the detailed examination of the cases provided in the analysis brings me to the conclusion that it was Government of India's responsibility to make sure that there was no mistake committed and in its fast-paced track to become developed country, not to bypass safety precautions required for approval of projects. Also the point which

struck me was the approval of the settlement of 470 million dollars without consideration with the victims first. This shows a lack of communication and infrastructure facilities impeding the processes. Then there are the endless politicians taking advantage of the tragedy for vote gains. This is illustrated by the arrest of Mr. Warren Andersen when he appeared in India as a spokesperson for the tragedy on the basis of negligent homicide. This was done by Madhya Pradesh (state where Bhopal is situated) Chief Minister of that time Mr. Arjun Singh for gains in the forthcoming elections. Even though Mr. Andersen was released on the advice of Central Government, it created an aversion in the officials of Union Carbide to appear in trials in India. The US courts could not do anything to accelerate their appearance. The only thing of fault I find with the US authorities in charge of this case is that they could not locate Mr. Andersen and he is still reported as “absconding”.

The lesson learnt from this for the safety culture is that while operating in developing countries with suspect regulation and infrastructure problems, the planning should incorporate several mechanisms usually not undertaken. The companies should include the monitoring facilities

1. The training of the supervisors should be even more diversified into the field of personal responsibility.
2. Supervisors, even though from the home country should be trained in American value system. This is important because if ever we are faced with such a catastrophe again, it is important that these issues when brought before American judge/jury will find the response lacking in ethics, even though these actions might be common place in the country where it occurred. This will expose the company to liability.
3. The company should be adept in dealing with the political climate of the system. In case of Bhopal Gas Tragedy, successive governments used the tragedy as a political pawn in overthrowing incumbent governments. This created high level of instability in the response undertaken by the State and Central Governments in India. Some of the lack of response was blamed upon Union Carbide. This will be the case in several developing countries. Political instability is a risk that is

that should be studied in greater detail when planning such ambitious projects in the developing nations.

4. Outreach programs are important in the case of Companies. This should be done in the center of the tragedy. Several outreach programs started by Union Carbide have not been completed. In this day of strong environmental movement, this will be duly noted by the environmental groups. The outreach programs should be concurrent with the start of a project.
5. Supervisors should not shy away from personal responsibility.
6. Supervisors should have multidivisionary authority to impose punishments and have authority to suspend activity when necessary.

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