UNION CARBIDE OF INDIA, LTD. (1985)

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December 2, 1984 began as a typical day in the central Indian city of Bhopal. Shoppers moved about the bustling, open-air market. Here and there a customer haggled with a merchant. Beasts of burden, donkeys and oxen, pulled carts or carried ungainly bundles through the partly paved streets. Children played in the dirt. In the shadow of a Union Carbide pesticide plant, tens of thousands of India's poorest citizens milled about the shanty town they called home. A few miles away, wealthy Indians lived in opulence rivaling that of the first-class districts of London or Paris. Inside the plant, several hundred Indian workers and managers went about their duties, maintaining and operating the systems which produced the mildly toxic pesticide Sevin. Most of the plant was shut down for maintenance and it was operating at far below capacity.

At about 11 o'clock that evening, one of the operators noticed that the pressure in a methyl isocyanate (MIC) storage tank read 10 pounds per square inch—four times normal. The operator was not concerned, thinking that the tank may have been pressurized with nitrogen by the previous shift. Around midnight several of the workers noticed that their eyes had begun to water and sting, a signal experience had taught them indicated an MIC leak. The leak, a small but continuous drip, was soon spotted.

The research assistance of Aseem Shukla is gratefully acknowledged.

The operators were still not alarmed because minor leaks at the plant were quite common. It was time for tea and most of the crew retired to the company canteen, resolving to correct the problem afterwards.

By the time the workers returned it was too late. The MIC tank pressure gauge was pegged. The leak had grown much larger and the entire area of the MIC tanks was enveloped in the choking fumes. The workers tried spraying water on the leak to break down the MIC. They sounded the alarm siren and summoned the fire brigade. As the futility of their efforts became apparent, many of the workers panicked and ran upwind—some scaling the chain-link and barbed-wire fence in their frantic race for survival.

By one o'clock, only a supervisor remained in the area. He stayed upwind, donning his oxygen breathing apparatus every few minutes to check the various gauges and sensors. Pressure in the MIC tank had forced open a relief valve and the untreated MIC vapor could be seen escaping from an atmospheric vent line 120 feet in the air.

The cloud of deadly white gas was carried by a southeasterly wind toward the Jai Prakash Nagar shanties. The cold temperature of the December night caused the MIC to settle towards the ground (in the daytime, or in the summer, convection currents probably would have raised and diluted the MIC).

As the gaseous tentacles reached into the huts there was panic and confusion. Many of the weak and elderly died where they lay. Some who made it into the streets were blinded. "It was like breathing fire," one survivor said. As word of the gas leak spread, many of Bhopal's affluent were able to flee in their cars. But most of the poor were left behind. When the gas reached the railroad station, supervisors who were not immediately disabled sent our word along the tracks and incoming trains were diverted. This cut off a possible means of escape but may have saved hundreds of lives. Because the whole station was quickly enveloped in gas, arriving trains would have been death traps for passengers and crews.

Of Bhopal's total population of about 1,000,000, an estimated 500,000 fled that night, most on foot. The surrounding towns were woefully unprepared to accept the gasping and dying mass of people. Thousands waited outside hospitals for medical care. There was no certainty about how to treat the gas victims and general purpose medical supplies were in hopelessly short supply. Inside the hospitals and out, screams and sobs filled the air. Food supplies were quickly exhausted. People were even afraid to drink the water, not knowing if it was contaminated.

During the second day, relief measures were better organized. Several hundred doctors and nurses from nearby hospitals were summoned to help medical personnel in Bhopal. Just disposing of the dead was a major problem. Mass cremation was necessary. Islamic victims, whose faith allows burial rather than cremation, were piled several deep in hurriedly dug graves. Bloated carcasses of cattle and dogs littered the city. There was fear of a cholera epidemic. Bhopal's mayor said, "I can say that I have seen chemical warfare. Everything so quiet. Goats, cats, whole families—father, mother, children—all lying silent and still. And every structure totally intact. I hope never again to see it."

By the third day, the city had begun to move toward stability, if not normalcy. The Union Carbide plant had been closed and locked. A decision was made to consume the 30 tons of MIC that remained by using it to make pesticide. Most of the 2,000 dead bodies had been disposed of, however inappropriately. The more than 100,000 injured were being treated as rapidly as the limited medical facilities would allow, although many simply sat in silence, blinded and maimed by an enemy they had never known well enough to fear. For them, doctors predict an increased risk of sterility, kidney and liver infections, tuberculosis, vision problems, and brain damage. The potential for birth defects and other long-term effects is not clear. However, months after the incident newspapers reported a high incidence of stillbirths and congenital deformities among the population which was affected by the gas.

COMPANY BACKGROUND

The Ever-Ready Company, Ltd. (of Great Britain) began manufacturing flashlight batteries in Calcutta in 1926. The division was incorporated as the Ever-Ready Company (India), Ltd. in 1934 and became a subsidiary of Union Carbide Corporation of New York. The name of the Indian company was changed to National Carbide Company (India), Ltd. in 1949 and to Union Carbide (India), Ltd. (UCIL) in 1959. The 1926 capacity of 40 million dry cell batteries per year was expanded to 767 million by the 1960s. In 1959, a factory was set up in India to manufacture the flashlights themselves.

By the 1980s, UCIL was involved in five product areas: batteries, carbon and metals, plastics, marine products, and agricultural chemicals. Table 1 provides production statistics for UCIL products. The company eventually operated fourteen plants at eight locations, including the headquarters operation in Calcutta. Union Carbide's petrochemical complex, established in Bombay in 1966, was India's first.

UCIL began its marine products operation with two shrimping ships in 1971. The business is completely export oriented and employs fifteen deep sea trawlers. Processing facilities are located off the east and west coasts of India. The trawlers now harvest deep sea lobsters in addition to shrimp.

In 1979, UCIL initiated a letter of intent to manufacture dry cell batteries in Nepal. A 77.5 percent owned subsidiary was set up in Nepal in 1982 and construction of a Rs. 18 million plant was begun.

The agricultural products division of UCIL was started in 1966 with only an office in Bombay. Agreement was reached with the Indian government in 1969 to set up a pesticide plant at Bhopal. Land was rented to UCIL for about $40 per acre per year. The initial investment was small, only $1 million, and the process was simple. Concentrated Sevin powder was imported from the USA, diluted with non-toxic powder, packaged, and sold. Under the technology transfer provisions of its agreement with UCIL, Union Carbide Corporation (USA) was obligated to share its more advanced technologies with UCIL. Eventually the investment at Bhopal grew to exceed $25

TABLE 1 PRODUCTION STATISTICS

Class of goods	1983 Capacity	Production levels 1983	1982	1981	1980	1979	1978
Batteries (millions of pieces)	792	510.4	512.2	411.3	458.8	460.3	430.3
Flashlight cases (millions of pieces)	7.5	6.7	6.7	7.4	6.9	6.4	5.7
Arc Carbons (millions of pieces)	9.0	7.5	7.0	7.0	6.7	6.2	6.1
Industrial Carbon Electrodes and Shapes (millions of pieces)	2.5	0.5	0.5	0.5	0.3	0.5	0.2
Photo-engravers' Plates/ Strips for Printing (tonnes*)	1,200	412.0	478.0	431.0	339.0	469.0	506.0
Stellite castings, head facings and tube rods (tonnes)	150	17.5	12.7	16.4	14.5	15.8	18.2
Electrolytic Manganese Dioxide (tonnes)	4,500	3,335	3,085	3,000	2,803	2,605	2,700
Chemicals (tonnes)	13,600	7,349	6,331	6,865	7,550	8,511	8,069
Polyethylene (tonnes)	20,000	18,144	17,290	19,928	19,198	16,324	12,059
MIC based pesticides (tonnes)	5,000	1,647	2,308	2,704	1,542	1,496	367
Marine products (tonnes)	5,500	424	649	642	601	648	731

*One tonne = 1,000 kilograms = 2,214 pounds. One British long ton = 2,240 pounds. One U.S. ton = 2,000 pounds.

Source: The Stock Exchange Foundation, Bombay, India, *The Stock Exchange Official Directory,* Vol. XVII/ 29, July 18, 1983.

million and the constituents of Sevin were made there. Another Union Carbide insecticide, called Temik, was made in small quantities at Bhopal.

UCIL's assets grew from Rs. 558 million in 1974 to Rs. 1,234 million in 1983 (the conversion rate stayed near 9 rupees to the dollar during this period, moving to about 12.50 as the dollar strengthened worldwide during 1984 and 1985—see Table 3). The *Economic Times* of India ranked UCIL number 21 in terms of sales among Indian companies. Union Carbide Corporation (USA) owned 50.9 percent of UCIL's stock and Indian citizens and companies owned the remainder. When Indira Gandhi was voted out of office in 1977, the Janata (Peoples') Party strengthened the Foreign Exchange Regulation Act (FERA) (see inset). As a result, IBM and Coca-Cola pulled out of India. IBM's business in India was taken over by ICIM (International Computers Indian Manufacturers), a domestic firm. Another similar firm was set up to perform the maintenance services for the existing IBM computers.

Since 1967 the chairman of the board of UCIL has been an Indian, and foreign membership on the eleven-member board of directors has been limited to four. One expert on Indian industry affairs said, "Though the foreigners on the board are down to four from six in previous years, they continue to hold sway over the affairs of the company." Major capital expenditures by UCIL were required to be approved by Union Carbide Corporation. Also, the Bhopal plant submitted monthly reports to U.S. corporate headquarters detailing operations and safety procedures. And inspections of the plant were carried out from time to time by Union Carbide technical specialists.

OPERATIONS AT BHOPAL

On the surface, the UCIL insecticide factory is a typical process plant. A wide diversity of storage tanks, hoppers, and reactors are connected by pipes. There are many pumps and valves and a number of tall vent lines and

THE FOREIGN EXCHANGE REGULATION ACT

The Act was originally enacted as a temporary measure in 1947 and made permanent in 1957. It was revised and redrafted in 1973. It covers various aspects of foreign exchange transactions, including money changing, buying or selling foreign exchange in India or abroad, having an account in a bank outside India, and remitting money abroad.

The purpose of the Act is to restrict outflow of foreign exchange and to conserve hard currency holdings in India. One requirement of the Act is that any company in which the non-resident interest is more than 40 percent "shall not carry on in India or establish in India any branch or office without the special permission of the Reserve Bank of India." But the Reserve Bank of India has authority to exempt a company from the provisions of the Act. The 40 percent requirement was changed to 49 percent by Rajiv Gandhi's government.

High technology companies are frequently exempted from the equity ownership provisions of the Act. Other companies which have operated in India for many years are sometimes exempted if they agree not to expand their Indian operations.

Policies in India regarding nationalization of foreign-owned companies have varied. A number of major oil companies have been nationalized. For example, Indian Oil Corporation, Bharat Petroleum, and Hindustan Petroleum used to be, respectively, Burmah Shell, Mobil, and Stanvae (Standard Vacuum Oil Company, an Esso unit). More typically, a multinational company is asked to reduce its holdings to 49 percent or less by offering shares to the Indian public and Indian financial institutions. Multinationals which have diluted equity to meet the 49 percent requirement include CIBA-GEIGY, Parke-Davis, Bayer (aspirin), Lever Brothers (which operates as Hindustan Lever in India), Lipton, and Brooke-Bond.

ducts. Ponds and pits are used for waste treatment and several railway spur lines run through the plant. Figure 1 is a diagram of the factory. Figure 1a is a schematic of just the MIC manufacturing process. The pesticide plant was designed and supplied by Union Carbide Corporation, which sent engineers to India to supervise construction.

Sevin is made through a controlled chemical reaction involving alpha-naphthol and MIC. Alpha-naphthol is a brownish granular material and MIC is a highly reactive liquid which boils and becomes a gas at usual daytime temperatures. When plans were first made to begin production of alpha-naphthol at Bhopal in 1971, a pilot plant was set up to manufacture the product. Because the pilot plant was successful, a full-size alpha-naphthol plant (in fact, the world's largest) was constructed and placed in operation in 1977.

In the meantime, work had begun on the ill-fated MIC plant. But even before the MIC plant was completed in 1979, problems began to crop up with the alpha-naphthol plant, resulting in a shutdown for modifications in 1978. In February 1980, the MIC plant was placed into service. The alpha-naphthol plant continued in various stages of shutdown and partial operation through 1984. Mr. V. P. Gokhale, managing director of UCIL, called the alpha-naphthol plant a "very large mistake." But he said the company was forced to build it to keep its operating license from the Indian government. The Bhopal factory was designed to produce 5,000 tons per year of Sevin but never operated near capacity. UCIL has generally been the third largest producer of pesticides in India, sometimes slipping to number four.

FINANCE

Tables 2, 3, 4, and 5 and Figure 2 provide financial facts and figures for UCIL. As mentioned earlier, Union Carbide Corporation (USA) holds 50.9 percent of UCIL's common shares. The remainder are publicly traded on major Indian stock exchanges. Most of these shares are held by about 24,000 individuals. However, a number of institutional investors own substantial blocks. The Indian government does not directly own any UCIL stock, although the Life Insurance Corporation of India, the country's largest insuror and owner of many UCIL shares, is owned by the Indian Government. During the months before the Bhopal disaster, UCIL's common shares hovered around Rs. 30, but dropped to a low of Rs. 15.8 on December 11, recovering only slightly in succeeding weeks.

In 1975, the United States Export-Import bank in cooperation with First National Citibank of New York agreed to grant loans of $2.5 million to buy equipment for the MIC project. Also, the Industrial Credit and In-

FIGURE 1. The UCIL pesticide factory at Bhopal.

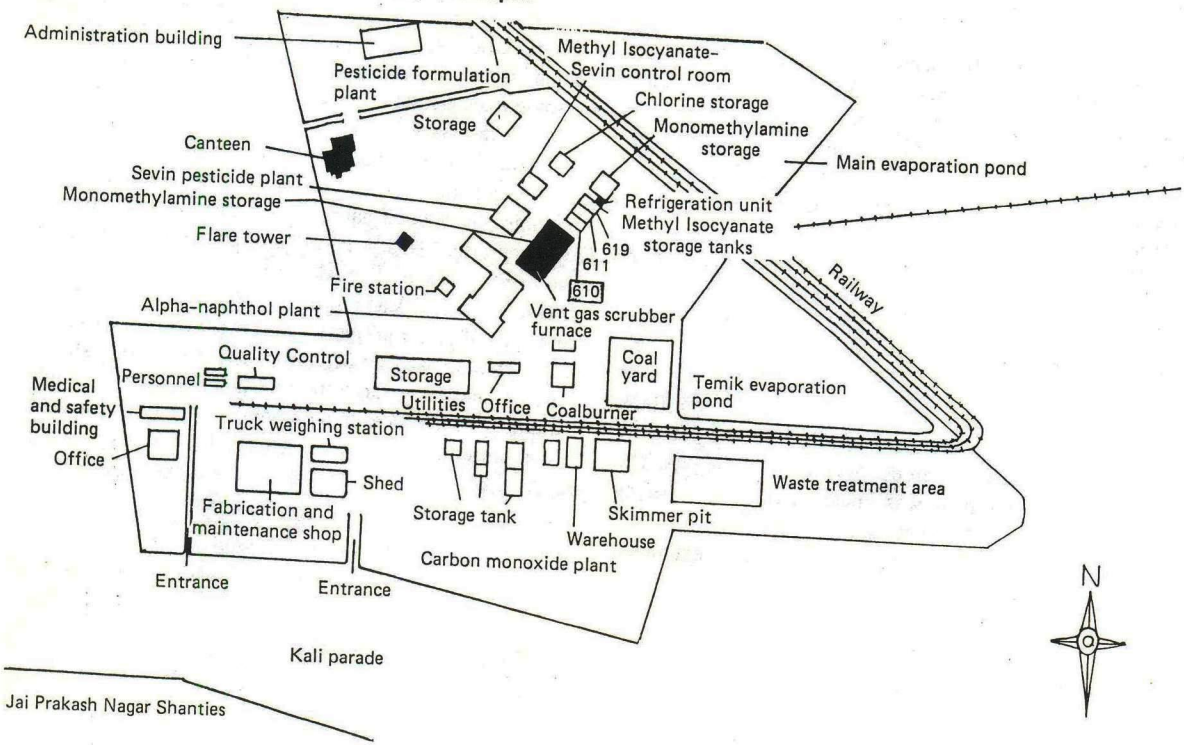


FIGURE 1a The methyl isocyanate manufacturing process.

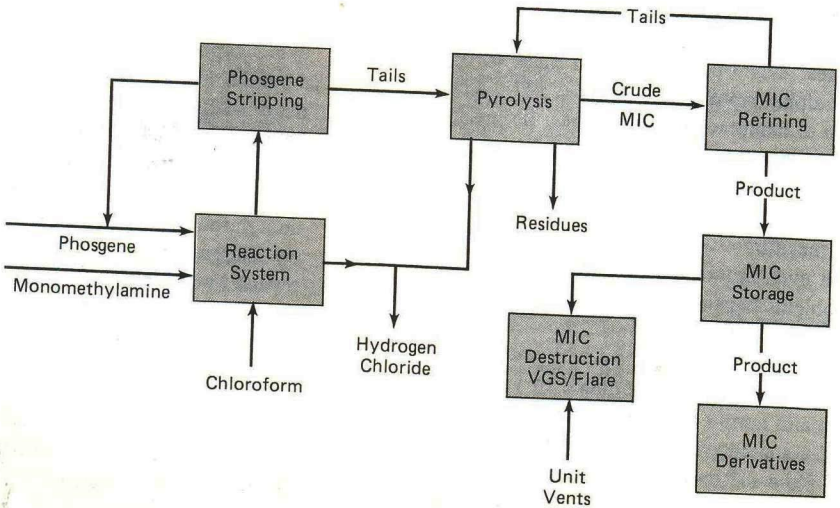


TABLE 2 SUMMARY OF INCOME STATEMENTS

For years ended December 25	1984 rs. lakhs	1983 rs. lakhs	1982 rs. lakhs
Income			
Sales (excluding value of products used internally rs. 57,65.80 lakhs—Previous year rs. 53,92.51 lakhs)	222,89.77	210,19.60	206,38.14
Other sources	1,32.40	1,96.06	2,83.28
	224,22.17	212,15.66	209,21.42
Expenditure			
Materials consumed	99,16.01	91,59.84	95,46.63
Excise duty	34,03.09	28,58.85	28,65.04
Operating expenses	65,97.52	66,68.39	60,98.25
Depreciation	5,01.12	4,75.79	4,16.14
Interest	4,73.15	5,75.29	5,26.61
	208,90.89	197,38.16	194,52.67
Profit before taxation	15,31.28	14,77.50	14,68.75
Provision for taxation	7,10.00	5,45.20	5,02.00
Profit after taxation	8,21.28	9,32.30	9,66.75
Transfer to investment allowance reserve	1,05.00	75.00	1,90.00
	7,16.28	8,57.30	7,76.75
Transfer from development rebate reserve	13.08	9.38	1.22
Balance brought forward from previous year	1,07.92	0.00	26.30
Available for appropriation	8,37.28	8,66.68	8,04.27
Appropriations			
Debenture stock redemption reserve	1,00.00	70.00	90.00
Unclaimed dividends paid	0.01	0.01	0.03
Interim dividend (@ R. 0.50 per share)	1,62.92	0.00	
Proposed dividend (subject to taxation)	0.00	4,88.75	4,88.75
General reserve	0.00	2,00.00	2,25.49
Balance carried forward to balance sheet	5,74.35	1,07.92	0.00

Notes: 1. 1 lakh = 100,000
2. Placement of commas in numbers differs from American practice.

TABLE 3 WHOLESALE PRICE LEVELS IN THE U.S. AND INDIA AND DOLLAR-TO-RUPEE CONVERSION RATES, 1974–1984

Year	U.S. producer price index*	India wholesale price index**	Conversion rate§
1974	161.1	169.2	8.111
1975	175.1	175.8	8.914
1976	183.6	172.4	8.985
1977	195.8	185.4	8.703
1978	197.1	185.0	8.189
1979	215.8	206.5	8.108
1980	244.5	248.1	7.872
1981	269.8	278.4	8.728
1982	280.7	285.3	9.492
1983	285.2	308.5	10.129
1984	291.1	334.0	11.402
1985			11.930§§

*Wholesale Price Index before 1978. Arithmetic average of January–December monthly figures. Base year, 1967 (January–December).

**Arithmetic average of April–March monthly figures. Base year, 1970 (April 1970–March 1971).

§Arithmetic average of monthly figures (rupees per dollar).

§§October 7, 1985, only.

vestment Corporation of India (ICICI) authorized a Rs. 21.5 million loan, part of which was drawn in 1980. Finally, long-term loans were provided by several Indian financial institutions and insurance companies. Some of these loans were guaranteed by the State Bank of India.

Profits of several million dollars from the Bhopal facility were originally predicted for 1984. Several factors kept these expectations from being realized. First, an economic recession made farmers more cost conscious and caused them to search for less expensive alternatives to Sevin. Second, a large number of small-scale producers were able to undersell the company, partly because they were exempt from excise and sales taxes. Seventeen of these firms bought MIC from UCIL and used it to make products virtually identical to Sevin and Temik. Finally, a new generation of low cost pesticides was becoming available. With sales collapsing, the Bhopal plant because a money loser in 1981. By late 1984, the profit estimate for that year had been adjusted downward to a $4 million *loss* based on 1,000 tons of output, one-fifth of capacity.

To forestall what may have seemed inevitable economic failure, extensive cost cutting efforts were carried out. The staff at the MIC plant was cut from twelve operators on a shift to six. The maintenance team was reduced in size. In a number of instances, faulty safety devices remained unrepaired for weeks. Because a refrigeration unit, designed to keep the methyl isocyanate cool, continued to malfunction, it was shut down. Though instrumentation technology advanced at Union Carbide's other pesticide plants, the innovations were only partly adopted at Bhopal.

The UCIL directors disclaim fault for the incident. The "Report of the Directors," included in UCIL's 1984 annual report, states,

> "At no time had any significant fault been found with the working or safety precautions taken by your Company. Your Company had taken all safety precautions to avoid any accident in the Plant, which had been operated all along with trained and qualified operators."

PERSONNEL

Until 1982, a cadre of American managers and technicians worked at the Bhopal plant. The Americans were licensed by the Indian government only for fixed periods. While in India, they were expected to train Indian replacements. From 1982 onward, no American worked at Bhopal. While major decisions, such as approval of the annual budget, were cleared with Union Carbide, USA, day to day details such as staffing and maintenance were left to the Indian officials.

TABLE 4 SUMMARY OF BALANCE SHEETS

As of December 25	1984 Rs. lakhs		1983 Rs. lakhs		1982 Rs. lakhs	
Funds employed						
Fixed assets						
Goodwill at cost	30.00		30.00		30.00	
Fixed assets	44,18.59		41,07.55		40,51.60	
Capital expenditure in progress	2,23.36	46,71.95	5,50.51	46,88.06	4,43.86	45,25.46
Investments		1,37.48		92.37		96.52
Current assets						
Stores & spares at cost	7,32.53		6,86.16		6,40.67	
Stocks	32,63.68		30,05.56		31,32.50	
Sundry debtors	16,27.25		23,93.25		30,00.83	
Cash & bank balances	5,38.88		4,23.79		5,22.05	
Loans & advances	12,23.91		8,87.32		7,87.21	
Interest accrued on investments	0.03		0.25		0.25	
	73,86.28		73,96.33		80,83.51	
Less: Current liabilities	20,53.60		21,34.92		23,36.49	
Provisions	6,10.68		10,07.14		10,71.12	
	26,64.28		31,42.06		34,07.61	
Net current assets		47,22.00		42,54.27		46,75.90
		95,31.43		90,34.70		92,97.88
Financed by						
Share capital & reserves						
Share capital—issued & subscribed	32,58.30		32,58.30		32,58.30	
Reserves and surplus	35,97.32	68,55.62	29,38.97	61,97.27	24,95.43	57,53.73
Loan capital						
Secured loans	13,53.56		14,33.75		22,32.15	
Unsecured loans	13,22.25	26,75.81	14,03.68	28,37.43	13,12.00	35,44.15
		95,31.43		90,34.70		92,97.88

Notes: 1. 1 lakh = 100,000
2. Placement of commas in numbers differs from American practice.

TABLE 5 SUMMARY OF COMMON STOCK ISSUES

	Paid-up common stock		
Year	# of shares	Total amount rs.	Remarks
1959–1960	2,800,000	28,000,000	800,000 right shares issued premium Rs. 2.50 per share proportion 2:5.
1964	3,640,000	36,400,000	840,000 right shares issued at a premium of Rs. 4 per share in the proportion 3:10.
1965	4,095,000	40,950,000	455,000 bonus shares issued in the proportion 1:8.
1968	8,190,000	81,900,000	2,047,500 right shares issued at par in proportion 1:2. 2,047,500 bonus shares issued in proportion 1:2.
1970	12,285,000	122,850,000	4,095,000 bonus shares issued in the proportion 1:2.
1974	18,427,500	184,275,000	6,142,500 bonus shares issued in the proportion 1:2.
1978	21,722,000	217,220,000	3,294,500 shares issued at a premium of Rs. 6 per share to resident Indian shareholders, the company's employees, and financial institutions.
1980	32,583,000	325,830,000	10,861,000 bonus shares issued in proportion 1:2.

In general, the engineers at the Bhopal plant were among India's elite. Most new engineers were recruited from the prestigious Indian Institutes of Technology and paid wages comparable with the best offered in Indian industry. Successful applicants for engineering jobs with UCIL were provided two years of training before being certified for unsupervised duty.

Until the late seventies, only first class science graduates or persons with diplomas in engineering were employed as operators at Bhopal. New hires were given six months of theoretical instruction followed by on-the-job training. As cost cutting efforts proceeded in the eighties, standards were lowered significantly. Some operators with only a high school diploma were employed and training was much less rigorous than before. In addition, the number of operators on shift was reduced by about half and many supervisory positions were eliminated.

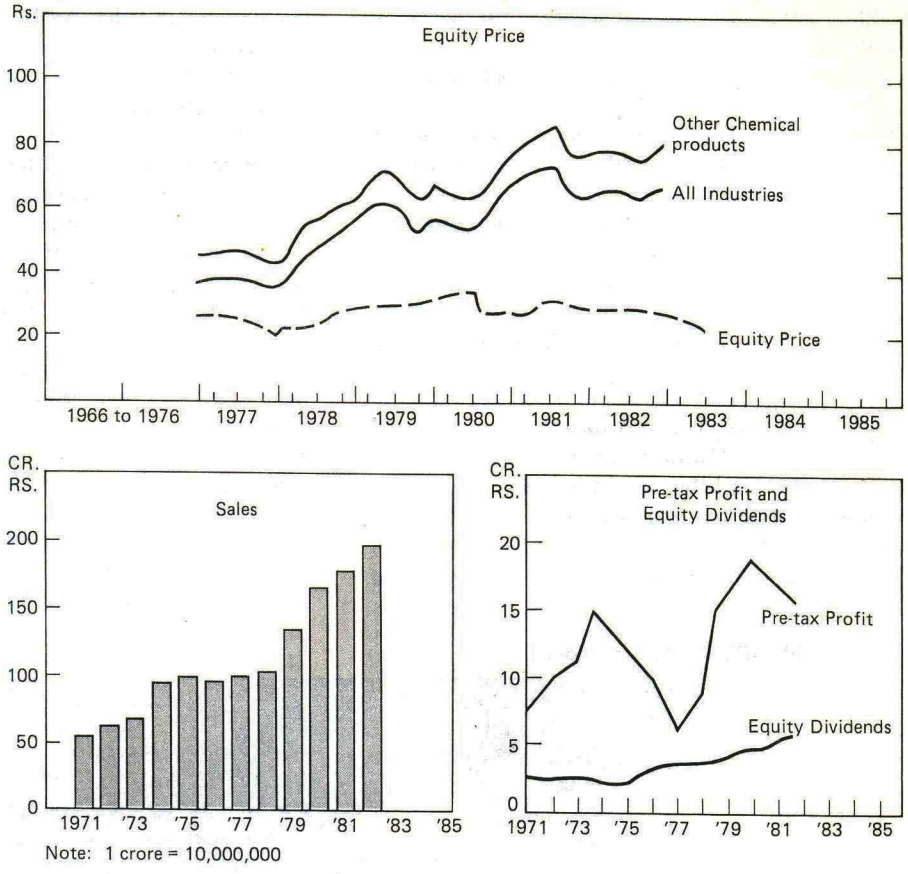
The Indian managers developed strong ties with the local political establishment. A former police chief became the plant's security contractor and a local political party boss got the job as company lawyer. *Newsweek* reports that a luxurious guest house was maintained and lavish parties thrown there for local dignitaries.

In general, wages at the Bhopal plant were well above those available in domestic firms. A janitor, for example, earned Rs. 1,000 per month compared to less than Rs. 500 elsewhere. Still, as prospects continued downward after 1981, a number of senior managers and the best among the plant's junior executives began to abandon ship. The total work force at the plant dropped from a high of about 1500 to 950. This reduction was accomplished through voluntary departures rather than layoffs. An Indian familiar with operations at Bhopal said, "The really competent and well trained employees, especially managers and supervisors, got sick of the falling standards and indifferent management and many of them quit despite high salaries at UCIL. Replacements were made on an ad hoc basis. Even guys from the consumer products division, who only knew how to make batteries, were drafted to run the pesticide plant."

MARKETING

The population of India is over 700 million persons, while its land area is only about one-third that of the United

FIGURE 2 UCIL financial charts.



States. Three-fourths of India's people depend on agriculture for a livelihood. Fewer than one-third are literate. Modern communications and transportation facilities connect the major cities, but the hundreds of villages are largely untouched by twentieth century technology. English tends to be at least a second language for most Indian professionals but not for ordinary Indians. There are 16 officially recognized languages in the country. The national language is Hindi, which is dominant in five of India's 22 states. The working classes speak hundreds of dialects, often unintelligible to citizens just miles away.

India's farmers offer at best a challenging target market. They generally eke out a living from small tracts of land. Most have little more than subsistence incomes and are reluctant to invest what they have in such modern innovations as pesticides. They are generally ignorant of the right methods of application and, given their linguistic diversity and technological isolation, are quite hard to educate. To advertise its products, UCIL has used billboards and wall posters as well as newspaper and radio.

Radio is the most widely used advertising medium in India. The state-owned radio system includes broadcasts in local languages. Companies can buy advertising time on the stations but it is costly to produce commercials in so many dialects. Much of the state-sponsored programming, especially in rural areas, is devoted to promoting agriculture and instructing farmers about new techniques. Often the narrators mention products such as Sevin and Temik by name.

Movies provide another popular promotional tool. Most small towns have one or more cinema houses and rural people often travel to town to watch the shows.

Advertisements appear before and after main features and are usually produced in regional languages (though not in local dialects).

Until recently, television was available only in the cities. During 1984, a government program spread TV relay stations at the rate of more than one each day, with the result that 80 percent of the population was within the range of a television transmitter by the end of the year. Still, few rural citizens had access to television receivers.

Pesticides sales are highly dependent on agricultural activity from year to year. In years of drought, like 1980 and 1982, UCIL's pesticide sales have suffered severe setbacks. In 1981, abundant rains helped spur pesticide sales.

Figure 3 is a map of India. India has a very extensive network of railways. The total track mileage is second only to the USSR. The road and highway system criss-crosses the areas in between railway lines. The railway system was especially significant to UCIL's pesticide operation because Bhopal lies near the junction of the main east-west and north-south tracks in India. Bhopal is also just south of the vast Indo-Gangetic plain, the richest farming area in India. An Indian familiar with the agricultural economy remarked, "Overall, physical distribution of pesticides is not too monumental a task. Getting farmers to use them and teaching them how are the real problems."

The marketing division for agricultural products was headquartered in Hyderabad. Under the headquarters were eight branch offices scattered all over the country. Sales were through a network of distributors, wholesalers, and retailers. Sales representatives from the branch offices booked orders from the distributors and wholesalers. Retailers got their requirements from wholesalers, who, in turn, were supplied by distributors. The distributors got their stocks from the branch offices. The branch office "godowns" (warehouses) were supplied directly from the Bhopal plant. The retailers' margin was fifteen percent. Wholesalers and distributors each received about five percent. Most of the retailers were family- or individually-owned although some of UCIL's pesticides were sold through government agricultural sales offices.

FIGURE 3 Map of India.

EVENTS OF 1985

In early 1985, the government of India cancelled the operating license of the Bhopal plant, clearing the way for the plant's dismantlement. The likelihood that this would happen provoked a Bhopal political leader to remark, "We've lost 2,000 lives, now must we lose 2,000 jobs?"

Manslaughter and other charges were filed against UCIL executives. Union Carbide Corporation chairman Warren Anderson had been briefly detained by Indian officials when he went to India shortly after the incident. Still, both companies continued for months to enjoy good relations with the Indian government. This may have been true in part because many leading Indian citizens and institutions have a financial interest in UCIL. And, except for the Bhopal incident, Union Carbide had an excellent safety record in India.

Warren Anderson said, "The name of the game is not to nail me to the wall but to provide for the victims of the disaster." He said he expected to be mainly concerned with the incident for the rest of his working life. Union Carbide Corporation offered to help provide funding for a hospital to treat the Bhopal victims. The company also contributed $1 million to a victims' relief fund. UCIL offered to build a new plant, one that would use nontoxic inputs, on the Bhopal site. One proposal was for a nonhazardous "Formulation Plant" to be constructed by UCIL and operated by the state government. Alternatively, UCIL suggested a battery factory to be owned and operated by the company. Both ideas were turned down in a letter dated May 15, 1985.

Within months after the incident, Union Carbide (USA) faced lawsuits in amounts far exceeding the company's net worth. That company's stock dropped from its mid-fifties trading range to the low thirties. A dozen or more American attorneys signed up thousands of Bhopal victims and relatives of victims and filed suits in America purporting to represent them. The Attorney General of India was authorized to sue Union Carbide in an American court. He stated that compensation had to be in accordance with American standards. A Minneapolis law firm which specializes in product liability cases was retained to represent India.

By March 1985, the streets of Bhopal were bustling again. There were cars, cattle, and crowds of people. But everywhere there were reminders of the disaster. Many wore dark glasses and covered their faces with shrouds to protect their injured eyes from the sunlight or to keep others from seeing their blindness. At the city's main police station, women and children continued to seek help. Vegetables shriveled by the poison gas were putting forth green shoots here and there. Occasionally, someone still fell sick from eating fish contaminated by MIC.

In the modernistic masonry-and-glass headquarters in Danbury, Connecticut, Union Carbide officials could look out on the beautiful Connecticut countryside and consider how best to manage the company's public affairs and how to grapple with the needs in India. Half a world away, in philosophical as well as physical distance, the poor of Jai Prakash Nagar, then poorer than ever, peered out from their shanties onto dusty streets and undoubtedly pondered quite different questions: From where would tomorrow's food come? How long would the pain inside and the dimming of vision last? And, just as importantly, what source of wealth would replace the pesticide plant? And how long would it be before its effects were felt?

In late June 1985, a lawsuit consolidating about 100 claims was filed in the U.S. by famed attorney F. Lee Bailey and his associates. The Indian government continued to press its lawsuit and to engage in out of court negotiations with Union Carbide. As the lawsuits in America moved forward, the legal issues involved became clearer: (1) Should the cases be tried in U.S. Courts or in Indian Courts? Both legal systems are based on English common law, but punitive damages are almost unheard of in Indian courts and compensatory damage awards are much lower than in America. (2) Should settlements be based on American standards simply because Union Carbide, the 51 percent parent of UCIL, is an American company, or on the much lower standards in India? (3) Who is responsible for the incident—Union Carbide, the Indian managers at Bhopal, the mostly Indian board of directors of UCIL, or the Indian government? (4) Which victims should be represented by the Indian government and which by the U.S. attorneys who went to India after the incident and signed up clients? (5) Did Union Carbide fail to properly warn the Indian managers at UCIL of the dangers posed by MIC? (6) Did Union Carbide fail to insure that appropriate safety equipment was installed at the Bhopal facility?

Negotiations between Union Carbide and Asoke K. Sen, the Indian Law Minister, seemed to have broken down in June 1985. Union Carbide had made a $230 million offer, with payment to be spread over twenty years. Mr. Sen said the offer was worth only $100 million in current terms and continued, "Union Carbide's offer is based on a total lack of appreciation of the magnitude of the problem, so is hardly worth consideration." He

said that doctors have treated 200,000 Indians injured by the gas leak and that the government is having to build 15,000 housing units and a 100-bed hospital to care for the most seriously ill.

On the other hand, a Union Carbide spokesperson said that $100 million could "pay the heirs of each dead person 100 years annual income . . . and the seriously injured 20 years annual income," leaving funds left over. The U.S. district judge under whom the Indian court cases were consolidated requested that Union Carbide pay $5 million in emergency aid, but that was rejected by the Indian officials. Mr. Sen said that India had already spent several times more than that on relief and that $5 million would not serve a critical need. A $268 million "five-year master plan" of economic development was announced by Indian officials in August 1985, but funding had not been approved. The plan called for redevelopment near the plant and in the city of Bhopal including building 5,000 houses, 12 hospitals, an electric trolley transportation system, and a number of "work sheds" to employ and train the unskilled and semi-skilled among the gas victims.

As Union Carbide (USA) struggled to recover from the disaster and restore its favorable public image, four events thrust the company back to the forefront of national and international news coverage. In June 1985, hundreds of persons were poisoned by California watermelons grown on soil to which the Union Carbide pesticide Temik had been applied (improperly applied, according to the company). In August, a leak of the chemical intermediate aldecarb oxime at the company's Institute, West Virginia plant, the only U.S. facility to make MIC, sent 135 people to hospitals. A few days later another accidental discharge of chemicals at a Union Carbide plant just miles from the Institute facility caused a public health scare. Finally, GAF Corporation increased its holdings of Union Carbide stock and announced an effort to gain control of the corporation. Union Carbide managers rushed to erect takeover barriers and took actions to make the company less desirable as a merger candidate. Union Carbide Corporation (USA) was reorganized into two separately-incorporated divisions, one for chemicals and plastics and one for other products. As part of the reorganization, the company wrote down various assets by nearly $1 billion (almost none of this was related to UCIL) and made plans to spend $500 million of surplus in the employee retirement fund "for general corporate purposes."

Even though West Virginia governor Arch Moore publicly criticized Union Carbide's handling of the aldecarb oxime leak and CEO Warren Anderson admitted that the company had waited too long to warn residents, Union Carbide stock moved about $50 a share for the first time since the Bhopal incident.

A number of UCIL employees and gas victims interviewed nearly a year after the incident generally agreed that "Union Carbide" (no distinction was made between the U.S. parent and its Indian subsidiary) and the government were to blame, that proper safety measures could have prevented the disaster, that the plant should be dismantled, and that the victims should receive economic and medical help as well as compensation for their injuries. A visitor to the area at about that time wrote,

> I saw the notorious UCIL plant from a distance. There are no plans to reopen it. Most of the workers have found other jobs. Bhopal looks normal on the surface, but a claims court right opposite the railway station with a big crowd of widows and dependents who had come to take their claims was a grim reminder.
>
> Also got some first hand accounts. Most of the railway personnel are coughing and wheezing even now. There are lots of people whose lungs have been permanently damaged (the corrosive nature of the gas has caused fibrosis, i.e., formation of scar tissue, so lung volume has reduced).

As the end of 1985 approached, there were few indications of progress toward settling the lawsuits. None of the victims had been compensated. UCIL was essentially out of the pesticide business, although the company's other divisions, especially those involving batteries and flashlights, remained profitable. UCIL's common stock traded near 30 rupees (Rs. 30) where it had been before the disaster and Union Carbide Corporation common stock was still trading above $50.