

CHARGE SHEET

Station SPF/CEI-ACU-I

NEW DELHI-1 District Delhi

Charge-sheet No. 2

Dated 30th November 1987

Address and Occupation of Complainant or informants Shri S.S. Thakur, T.I. Hanumanganj, Bhopal First Information report number 3 Date 6th December 1984

	Names and addresses of accused persons sent up for trial	Names and addresses of accused persons not sent for trial whether arrested or not arrested including absconders	Property (including weapons found with particulars of where, when, and by whom found and whether forwarded to magistrate	Names and addresses of witnesses	Charge of information, names of offence and circumstances connected with it in concise details and under what section of law charged
In Custody	On bail or recognizance				
1	2	3	4	5	
Nil	<ol style="list-style-type: none"> 1. Sh. Warren Anderson, Former Chairman, Union Carbide Corporation, 39, Old Ridgebury Road, Danbury Connecticut, U.S.A. 06817 2. Shri Keshub Mahindra, former Chairman, UCIL, 15 Mathew Road, Bombay-400 004 residing at Flat No. 9 & 10, St. Helen's Court, G. Deshmukh Marg, Bombay-400 026. 3. Shri Vijay Gokhale, former Managing Director and presently Chairman-cum-Managing Director UCIL, 15, Mathew Road, Bombay-400 004. 4. Shri Kishore Kamdar, former Vice-President Incharge, A.P. Division, UCIL, 15, Mathew Road, Bombay-400 004 residing at Kshitij, 19th Floor, Flat No. 191, Napean Sea Road, Bombay-400 006. 	Nil	As per list attached	As per list attached	Union Carbide India Ltd. the majority share holding in which is held by UCC, USA, was running a factory at Bhopal for the manufacture of pesticides. The main chemical from which the pesticide Sevin was manufactured was Methyl Isocyanate ($\text{CH}_3 \text{N} = \text{C}=\text{O}$) which was also being manufactured in the same factory and was being stored in underground tanks. The factory is presently not functioning.

5. Shri J. Mukund, former Works Manager, A.P. Division, UCIL, Bersala Road, Bhopal, residing at 6D Land send Downgersi Raod, Bombay-400 006.
6. Dr. R.B. Roy Chowdhury, former Asstt. Works Manager, A.P. Division, UCIL, Berasia Road, Bhopal, residing at Satya Flat No. 10, 15th Road, Bandra, (W) Bombay-400 050.
7. Shri S.P. Choudhury, former Production Manager, A.P. Division, UCIL, Berasia Road, Bhopal, residing at 12, Akor Park, behind Meera Society, Shanker Shet Raod, Gultakdi, Pune-410 037.
8. Shri K.V. Shetty, Plant Superintendent, A.P. Division, UCIL, Berasia Road, Bhopal.
9. Shri S.I. Qureshi, Production Assistant, A.P. Division, UCIL, Berasia Road, Bhopal.
10. Union Carbide Corporation, 39, Old Ridgebury Road, Danbury, Connecticut USA, 06817.
11. Union Carbide (Eastern) Inc. 16th Floor, New World Office Building (East Wing) 24 Salisbury Road, Tsimsha Tsui, Kowloon, Hong Kong.
12. Union Carbide India Ltd., I, Middleton Street, Calcutta-16.

Further list, if any will be submitted on completion of remaining investigation.

2. On the night of 2nd December, 1984 from about 00.00 to 0045 hrs. (on 3rd December 1984) onwards, MIC started to escape from tank No. 610 in the factory in large quantities causing the death of thousands of human beings (sic illegible) animals on short as well as long-term basis and injuring also the health of many thousands of human beings and animals.

3. Crime No. 1104/84 registered at police station Hanumanganj at Bhopal on 6th December 1984 by the S.H. Shri Surinder Singh Thakur, Inspector who observed people dying around the factory of Union Carbide India Ltd., Bhopal (UCIL) due to escape of some gas from the factory. He registered the case suo moto under section 304A IPC. There was

Despatched at 6.45 p.m.

Signature of Investigation Officer

on 30th November, 1987

information available at that time from anyone in the Factory. But on enquiries made by him during the course of the day, five employees of the Factory (A5 to A9) were arrested and kept in police custody. Accused No. 1 Shri Warren Anderson was arrested along with accused No. 2 and 3 on 7th December 1984. Shri Warren Anderson was released on bail the same day by the I.O. After completing the required legal formalities, C.B.I. (D.S.P.E.) registered a case on 6th December 1984 as RC-3/84-CIU(I) U/s. 304A IPC and received the records of the case from the local police on 9th December 1984 along with A2, A3, and A5 to A9 in police custody from the Madhya Pradesh Police.

4. Investigation has revealed that the Union Carbide Corporation is a company with headquarters in U.S.A. having affiliate and subsidiary companies throughout the world. These subsidiaries were supervised by four regional offices which were controlled by UCC, U.S.A. UCIL is a subsidiary of UCC, U.S.A. Union Carbide Eastern Inc. with its office in Hong Kong is the regional office of UCC USA which controlled UCIL, India, besides others. UCC, U.S.A. got incorporated in India on 20th June 1934 a Company known as the Eveready Company (India) Ltd., under the Indian Companies Act (Act VII) of 1913 with the Registrar of Joint Stock Companies, Bengal. The name of the company was further changed w.e.f. 24th December 1959 into Union Carbide India Ltd. under the Indian Companies Act, 1956. The UCC was a majority shareholder (50.9%) in UCIL. UCC was nominating its own Directors to the Board of Directors of the UCIL and was exercising strict financial administrative and technical control on the Union Carbide India Ltd. Thus, all major decisions were taken under the orders of the Union Carbide Corporation of America. The evidence collected during the investigation proves that UCC was in total control of all the activities of UCIL.

5. The investigation of this case was dependent on highly scientific and technical evaluation of the events which led to the escape of MIC gas from the UCIL plant at Bhopal. The Government of India therefore constituted, immediately after the incident a team headed by Dr. S. Varadarajan, then DG/CSIR to study all the scientific and technical aspects and submit their report. Dr. M. Sriram, Chief Research and Development Manager, Hindustan Organic Chemicals, Rasayani, District Raigad (Maharashtra), was a member as well as co-ordinator of the scientific team. Dr. Varadarajan submitted the report in December, 1985. A further back up report was submitted by the C.S.I.R. in May 1987. These reports furnish, *inter alia*, the causes that led to the incident.

6. Investigation has revealed that UCIL started importing Sevin from the UCC, USA in December 1960. They were marketing this Sevin after adding dilutants etc. Subsequently, they decided to manufacture Sevin in their plant at Bhopal itself and accordingly created necessary facilities for production of Sevin with MIC as the basic raw material. To start with, they were importing MIC in 200 litres capacity stainless steel drums from the UCC plant in West Virginia, USA. Subsequently UCC and UCIL decided to manufacture MIC in their factory at Bhopal itself.

7. At that stage on 13th November, 1973, UCC and UCIL entered into an agreement entitled Foreign Collaboration Agreement according to which the best manufacturing information then available from or to Union Carbide had to be provided for the factory in India. This necessitated UCC supplying the design,

know-how and safety measures for the production, storage and use of MIC which ought to have been an improvement on the factory of UCC at West Virginia based on the experience gained there. Investigation has however disclosed that the factory at Bhopal was deficient in many safety aspects. The design, know-how and safety measures were provided by the Union Carbide Corporation, USA and the erection and commissioning of the plant was done under the strict control of the experts of UCC. The Indians in this plant were only working under their directions.

8. After an initial period of profit, the UCIL factory was running in loss. The loss for the first 10 months of 1984 amounted to Rs. 5,03, 39,000/- Due to this, U.C.E., Hong Kong directed UCIL vide their letter dated 26th October, 1984 that the factory at Bhopal should be closed down and sold to any available buyer. As no buyer became available in India, UCE Hong Kong, directed UCIL to prepare an estimate for dismantling the factory and shipping it to Indonesia or Brazil where they probably had some buyers. These estimates were completed towards the end of November 1984.

9. The investigation conducted by the C.B.I., the report of the scientific team established by Government of India and in particular the literature and manuals etc. regarding MIC of Union Carbide Corporation itself prove that MIC is reactive, toxic, volatile and flammable. It is a highly hazardous and lethal material by all means of contact and is a poison. Skin contact with MIC can cause severe burns. MIC can also seriously injure the eyes even in 1% concentration. Exposure to MIC is extremely, irritating and would cause chest pain, coughing, choking and even pulmonary edema. On thermal decomposition, MIC would produce hydrogen cyanide, nitrogen oxide, carbon monoxide and/or carbon dioxide.

10. MIC has to be stored and handled in stainless steel of types 304 or 316, namely good quality stainless steel. Using any other material could be dangerous. In particular, iron or steel, aluminium, zinc or galvanized iron, copper, or tin or their alloys could not be used for purposes of storage, transfer/transmission of MIC. This would mean that even the pipes and valves carrying MIC had also got to be of the prescribed stainless steel. In other words, at no stage should MIC be allowed to come into contact with any of the metals mentioned above.

11. The tanks storing MIC, have to be, for reasons of safety, twice the volume of the MIC to be stored. It was also advised by UCC itself that an empty tank should also be kept available at all times for transferring MIC from its storage tank to the standby tank on occasions of emergency. MIC has to be stored in the tanks under pressure by using nitrogen which does not react with MIC. The temperature of the tank with MIC has to be maintained below 15°C and preferably at about 0°C. The storage system and the transfer lines have to be free of any contaminants as even trace quantities of contaminants are sufficient to initiate reaction which could become runaway reaction. On reaction setting in, there could be dangerous and rapid trimerization. The Induction period could vary from several hours to several days. The heat generated could cause reaction of explosive violence. In particular, water reacts exothermically to produce heat and carbon dioxide. Consequently, the pressure in the tank will rise rapidly if MIC is contaminated with water. The reaction may begin slowly, especially if there is no agitation, but it will become violent. UCC itself states that with bulk systems contamination is more likely than with tightly sealed drums. All these properties

of MIC show that despite all the safety precautions that could be taken, storage of large quantities of MIC in big tanks was fraught with considerable risk.

12. Investigation has disclosed that at the time the incident took place there were three partially buried tanks in the factory at Bhopal. These were numbered E 610, E 611 and E 619. MIC was being stored generally in the tanks E 610 and E 611. E 619 was supposed to be the stand-by tank. In the normal running of the factory, MIC from E 610 and E 611 was being transferred to the Sevin plant through stainless steel pipe lines. MIC is kept under pressure by nitrogen which is supplied by a carbon steel header common to all the storage tanks. There is a strainer in the nitrogen line. Subsequent to the strainer the pipe is of carbon steel and leads to make up control valve (DMV) which also has a body of carbon steel. These carbon steel parts could get exposed to MIC vapours and get corroded, providing a source of contaminant which could enter the MIC storage tank and cause dangerous reactions in the MIC. During the normal working of the factory, MIC fumes and other gases that escape pass first through a pipe line called Process Vent Header (PVH) of 2" diameter. The escaping gases were carried by the PVH line to a Vent Gas Scrubber (VGS) containing alkali solution which would neutralize the escaping gases and release them into the atmosphere. Another escape line of such gases that was provided from the tanks was the Relief Valve Vent Header (RVVH) of 4" diameter. Normal pressure of the MIC tank is shown by a pressure indicator. When the pressure in the tank exceeded 40 psig, a rupture disc (RD) leading to a safety relief valve (SRV) had to break and the said SRV in the RVVH line open automatically to allow the escaping gas to travel through the RVVH line to the VGS for neutralization.

13. Investigation has shown that the PVH and RVVH pipe lines as well as the valves therein were of carbon steel. Besides, on account of design defect these lines also allowed back flow of the alkali solution from the VGS to travel upto the MIC tanks.

14. A very essential requirement was that the MIC tanks in the factory had to be kept under pressure of the order of 1kg/cm²g by using nitrogen, a gas that does not react with MIC. However, MIC in tank No. 610 was stored under nearly atmospheric pressure from 22nd October, 1984 and attempts to pressurize it on 30th November and 1st December, 1984 failed. The design of the plant ought not have allowed such a contingency to happen at all. The tank being under nearly atmospheric pressure, free passage was available for the entry of back flow of the solution from the VGS into the tank. According to the report of Dr. Varadarajan Committee, about 500 kgs. water with contaminants could enter tank 610 through RVVH/PVH lines. The water that entered RVVH at the time of water flushing along with backed up alkali solution from the VGS already present could find its way into the tank 610 through the RVVH/PVH lines via the blow down DMV or through the SRV and RD.

15. The first indication of any reaction in the tanks comes through the pressure and temperature indicators. The thermowell and temperature transmitting lines were out of order throughout and no temperature was being recorded for quite some time. Pressure was also being recorded at the end of each shift of 8 hours duration instead every 2 hours as was being done earlier.

16. Shifts in the factory ended at 6.45 AM, 2.45 PM and 10.45 P.M.

17. On 2nd December, 1984 before 10.45 P.M. no deviation was noticed in the pressure of tank No. 610. Soon thereafter, in the night shift, some operators noticed leakage of water and gases from the MIC structure and they informed the Control Room. The Control Room operator saw that the pressure had suddenly gone up in tank No. 610. Some staff in the IIIrd shift including S/Shri R.K. Kamparia, C.N. Sen and Saumen Dey checked the pressure indicators on the tank E 610 and found that the pressure had gone out of range. The factory staff tried to control the situation but they failed. Even tank E 619 which had to be kept empty for emergency transfers was found to contain MIC and therefore when the reaction started, transfer thereto from tank 610 was not possible. The staff on duty immediately informed senior officials of UCIL at Bhopal about the escape of MIC. During all these developments and even thereafter the Union Carbide officials at Bhopal did not give any information to the residents or any local authority about the serious dangers to which the people were exposed and regarding which the said officials had full knowledge. On the other hand, what was initially mentioned was that ammonia gas had escaped.

18. The scientific team headed by Dr. Varadarajan has concluded that the factors which led to the toxic gas leakage causing its heavy toll existed in the unique properties of very high reactivity, volatility and inhalation toxicity of MIC. The needless storage of large quantities of the material in very large size containers for inordinately long periods as well as insufficient caution in design, in choice of materials of construction and in provision of measuring and alarm instruments, together with the inadequate controls on systems of storage and on quality of stored materials as well as lack of necessary facilities for quick effective disposal of material exhibiting instability, led to the accident. These factors contributed to guidelines and practices in operations and maintenance. Thus the combination of conditions for the accident were inherent and extant.

19. Post-mortem, medical and other evidence prove that the deaths and injuries were caused due to the exposure of the people to MIC and its derivatives, including Cyanide.

20. The investigation conducted by the C.B.I. has proved the following aspects:-

- (i) MIC is a highly dangerous and toxic poison.
- (ii) Storing huge quantity of MIC in large tanks was undesirable and dangerous as the capacity and actual production in the Sevin plant did not require such a huge quantity to be stored. Only adequate quantity of MIC should have been stored, that too in small separate stainless steel drums.
- (iii) The VGS that had been provided in the design was capable of neutralising only 13 tonnes of MIC per hour and proved to be totally inadequate to neutralise the large quantities of MIC that escaped from tank No. E 610. When the two tanks (610 and 611) themselves had been designed for storing a total of about 90 tonnes of MIC, proportionately large capacity VGS should have been furnished in the design and erected rather than the VGS that was actually provided.
- (iv) Due to the design defect, there was back flow of alkali solution from

the VGS to the tanks which had been drained in the past by the staff of UCIL. In fact, even after the incident, such draining was done from the PVH and RVVH lines.

- (v) Whereas the MIC tanks had to be constantly kept under pressure using nitrogen, the design permitted the MIC tanks not being under pressure in certain contingencies.
- (vi) The refrigeration system that had been provided was inadequate and inefficient. No alternate standby system was provided.
- (vii) Neither the UCC nor the UCIL took any steps to apprise the local administration authorities or the local public about the consequences of exposure of MIC or the gases produced by its reaction and the medical steps to be taken immediately.

21. Apart from these design defects, the further lapses that were committed were :-

- (a) Invariably storing MIC in the tanks which was much more than the 50% capacity of the tanks which had been prescribed.
- (b) Not taking any adequate remedial action to prevent back flow of solution from VGS into the RVVH and PVH lines. This alkali solution/water, therefore, used to be drained.
- (c) Not maintaining the temperature of the MIC tanks at the preferred temperature of 0°C but at ambient temperatures which were much higher.
- (d) Putting a slip blind in the PVH line and connecting the PVH line with a jumper line to the RVVH line.
- (e) Not taking any immediate remedial action when tank No. E 610 did not maintain pressure from 22nd October, 1984 onwards.
- (f) When the gas escaped in such large quantities, not setting out an immediate alarm to warn the public and publicise the medical treatment that had to be given immediately.

22. Investigation has shown that even if these lapses had not occurred, still the incident would have taken place due to the basic defects in the design supplied by the UCC whose experts supervised the erection and commissioning of the plant itself. The lapses only helped to aggravate the consequences of the incident. The lapses were also of such nature which could be reasonably foreseen as inevitable in any such factory and the design ought to have catered to ensure total safety even if such lapses took place. The design did not however do so.

23. The evidence collected during the investigation proves that the accused persons had the knowledge that by the various acts of commission and omission in the design and running of the MIC based plant, death and injury of various degrees could be caused to a large number of human beings and animals. All the accused persons joined in such acts of omission and commission with such common knowledge. This resulted in the incident on the night of 2nd/3rd December, 1984 which caused the death immediately and till date of about 2850 human beings and about 3000 animals. The number of affected persons is more than 5,00,000. The ailments developed by the affected persons include damaged respiratory tract

function, gastro intestinal functions, muscular weakness, forgetfulness etc.

24. The investigation has established that S/Shri Warren Anderson, then Chairman, Union Carbide Corporation, USA; Keshub Mahindra, then Chairman, UCIL Bombay; Vijay Gokhale, then Managing Director and presently Chairman-cum-Managing Director, UCIL, Bombay; Kishore Kamdar, then Vice-President Incharge, A.P. Division, UCIL, Bombay; J. Mukund, then Works Manager, A.P. Division, UCIL, Bhopal; Dr. R.B. Roy Chowdhury, then Asstt. Works Manager, A.P. Division, UCIL, Bhopal; S.P. Chowdhury, the Production Manager, A.P. Division, UCIL, Bhopal; K.V. Shetty, Plant Superintendent, A.P. Division, Bhopal; S.I. Qureshi, Production Assistant, A.P. Division, UCIL, Bhopal; the Union Carbide Corporation, U.S.A.; Union Carbide Eastern Inc. Hongkong and Union Carbide India Limited, Calcutta have committed offences punishable under sections 304, 326, 324, 429 IPC r/w section 35 IPC.

25. Due to the complicated nature of the case and certain difficulties that were encountered in the investigation, some further investigation still remains to be done which is proposed to be continued after submission of this charge-sheet. While the control exercised by Union Carbide Eastern Inc. Hongkong, over UCIL has been proved during the investigation by the records of UCIL, this requires to be further confirmed by interrogating the concerned executives of the Hongkong Company and collecting the relevant documents. The same has to be done in respect of UCC, USA also. In particular, the UCC plant at West Virginia in USA has also to be inspected. Some further investigation is also to be done with reference to the records of the Government of Madhya Pradesh many of which are still to be made available to the Investigating Officer. Though such further investigation is statutorily permitted under Section 173 (8) of the Code of Criminal Procedure, 1973, it is requested that this Hon'ble Court may be pleased to take note of this fact and permit the same.

26. It is, therefore, prayed that this Hon'ble Court may summon the accused persons and conduct the trial according to law in respect of the offences mentioned above.

(B.K. SHUKLA)

Dy. Supdt. of Police

CBI : ACU(I) : New Delhi

Encl :*

1. "Jamanat Nama" of Shri W.M. Anderson, dated 7th December, 1984. Surety given by Shri A.M. Kuruvila, then General Accountant, UCIL, Bhopal.
2. "Muchalaka" of Shri Warren Anderson, dated 7th December, 1984.
3. List of documents (28 sheets)
4. List of witnesses. (10 sheets)

Submitted to court by

U.S. Prasad

Senior Public Prosecutor

C.B.I., A.C.U.I. New Delhi

Dated 30.11.1987

*The enclosures have been excluded. *Ed.*