

BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

Original Application No. 448 of 2022

**In re: News item published in Hindustan Times dated 03.06.2022 titled
"178 Women workers fall ill after gas leak in Andhra's
Visakhapatnam"**

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Date: 14.12.2022

Place: Vijayawada


Chairman
AP Pollution Control Board

**BEFORE
THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

**News item published in Hindustan Times dated 03.06.2022 titled “178
Women workers fall ill after gas leak in Andhra’s Visakhapatnam”**



Joint Committee meeting on 01.09.2022



Field visit of Joint Committee on 02.09.2022

**2nd Interim Report
of the Joint Committee
Appointed by the National Green Tribunal
in the matter of
O.A. No.448 of 2022**

December, 2022

2nd Interim Report on the Incidents occurred on 03.06.2022 and 02.08.2022 at M/s Brandix Intimate India Pvt. Ltd., (formerly M/s Seeds Intimate Apparel India Pvt. Ltd.) located in the premises of M/s. Brandix India Apparel City Pvt., Ltd, SEZ, Atchuthapuram, Anakapalli District, Andhra Pradesh.

1.0 Preamble

The Hon'ble National Green Tribunal, Principal Bench, New Delhi initiated the proceedings suo-moto based on the News item published in Hindustan Times dated 03.06.2022 titled "178 women fall ill after gas leak in Andhra's Visakhapatnam" in O.A. No. 448/2022. The Hon'ble National Green Tribunal (NGT) vide order dated 03.08.2022 constituted a joint committee headed by the Chairman, APPCB to ascertain cause of incident and suggest measures to prevent such incidents.

2.0 Order of the Hon'ble NGT dated 03.08.2022

The Hon'ble NGT in O.A No. 448 of 2022, dated 03.08.2022 passed the following order:

"10. The statutory safety norms are laid down inter-alia in manufacture, Storage and Import of Hazardous Chemical Rules, 1989 (the 1989 Rules), Chemical Accidents (Emergency Planning, Preparedness and Response) Rules 1996 (the 1996 Rules), Factories Act 1948 and Disaster Management Act 2005. The 1989 Rules require on-site and off-site plans and holding mock drills, apart from other safety issues including siting. Chemical Accidents Rules provide for establishment of Central, State, District and Local Crisis Alert Systems. Director Industrial Safety and State Chief Inspector of Factories are to deal with the safety issues under the Factories Act. National Disaster Management Authority and other such authorities at State and District levels have been constituted under the Disaster Management Act, 2005.

11. Accordingly, we constitute a six-member Joint Committee headed by Chairman State PCB with Regional Director, CPCB, nominee of NDMA, Prof. P.

Jagannadha Rao, Department of Chemical Engineering, Andhra University, Visakhapatnam, District Magistrate, Anakapalli, Director Industrial Safety, Andhra Pradesh and Indian Institute of Chemical Technology, Hyderabad. State PCB will be the nodal agency for coordination and compliance. The Committee may hold its first meetings preferably within two weeks and all or some of the Members may undertake visit to the site and interact with the stakeholders and victims to ascertain factual position. Except for site visit, other proceedings may be physical or online. The Committee will be at liberty to co-opt any other Experts/Institution. The Committee may ascertain cause of present incident and suggest measures to prevent such incidents. It may mark areas prone to such incidents and vulnerable industries so as to detect marker pollutant in case of mishaps and take immediate crisis management measures in future, apart from fixing accountability for the incident. Report of the Committee may be furnished within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF. If any violators are identified, copy of the report may also be furnished to them so that they may file their response, if any, before this Tribunal.

12. Though in the present matter hearing was concluded on 01.08.2022 and order was to be pronounced within two days, it has come to our notice from today's media report that a further incident of gas leak has taken place in the area from M/s Seeds Intimate Apparel India Pvt., Ltd., in Brandix SEZ in Anakapalle District of Andhra Pradesh. This has affected about 50 people. This incident may also be taken into account by the Committee and if possible, the Committee may undertake site visit within one week and give an interim report of the factual observations, preferably within two weeks. Based on the said factual observations, further course of action may be indicated in the final report."

A copy of the Hon'ble NGT order is enclosed in **Annexure - 1**

In compliance to Hon'ble NGT order, APPCB as Nodal agency constituted a Committee Comprising of following members:

1. The Chairman, APPCB.
2. Smt. H D Varalaxmi, Sc. E & Regional Director, CPCB, Chennai.
3. Dr. S.K. Ghosh, NDMA.
4. Dr. P. Jagannadha Rao, (*Retd.*) Professor, Dept. of Chemical Engg, Andhra University, Visakhapatnam.
5. Shri Ravi Pattanshetti, I.A.S., District Collector & District Magistrate, Anakapalli.
6. Shri D. Chandrasekhar Varma, Director of Factories.
7. Dr. A. Krishnaiah, IICT, Hyderabad.

3.0 Meeting and Site visit by the Committee:

In compliance of the above mentioned order, the Chairman, APPCB convened a Committee meeting on 19.08.2022 through video conference and briefed about the mandate of the Committee as well as introduction about both incidents happened at M/s Seeds Intimate Apparel India (P) Ltd., The Committee discussed in detail and concluded to visit the site and also decided to co-opt the following three experts:

1. Dr. Shaik Basha, Scientist & Head, CSIR-NEERI, Hyderabad Zonal Centre, Hyderabad.
2. Prof. S. Balaprasad, Dept. of Civil Engg, Andhra University, Visakhapatnam.
3. Prof. K.V. Rao, (*Retd.*), Dept. of Chemical Engg, Andhra University, Visakhapatnam.

Subsequently, the Committee headed by the Chairman, APPCB and co-opted experts visited the M/s Seeds Intimate Apparel India (P) Ltd., during September 01-02, 2022 and interacted with stake holders as well as affected workers and also visited the other 14 units of M/s Brandix India Apparel City (P) Ltd., In compliance of Hon'ble NGT order, the joint Committee submitted an interim report on 02.11.2022, the copy of the report is enclosed as **Annexure - 2**.

4.0 About M/s Brandix Intimate India (P) Ltd., (formerly known as M/s

Seeds Intimate Apparel India (P) Ltd.,

M/s. Seeds Intimate Apparel India (P) Ltd was recently acquired by the Brandix Apparel India Ltd and renamed as M/s. Brandix Intimate India (P) Ltd (BIIL). M/s. BIIL (formerly known as M/s. Seeds Intimate Apparel India (P) Ltd) registered as a factory under section 2m (i) of Factories Act bearing Registration No 104025. Sri Rajiv Priyan Malasekera is the occupier of the factory and Sri. Sanjewa Abeyrathna is the manager of the factory. The maximum horse power permitted is 3715.39 HP and maximum employees permitted upto 5000. As such, this unit is categorized as non-hazardous factory.

M/s. BIIL has four building blocks namely M1, M2, L and N blocks and open space /areas. The layout of the unit is shown in Figure 1.

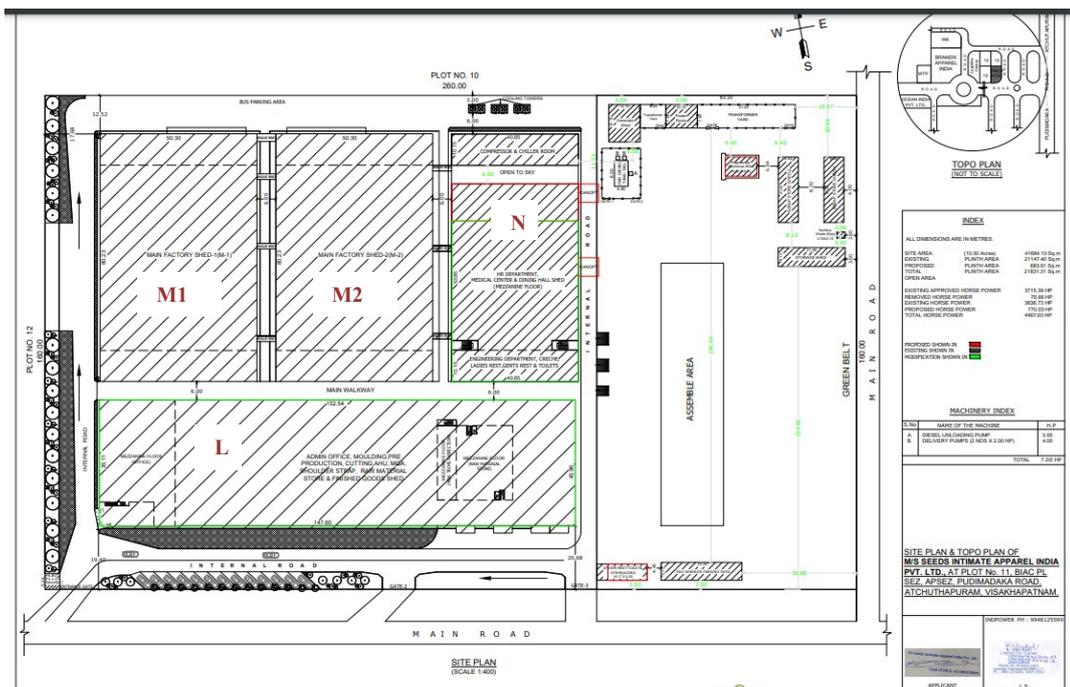


Figure 1: The layout of the M/s. Brandix Intimate India (P) Ltd., Unit in Brandix India Apparel City (P) Ltd.,

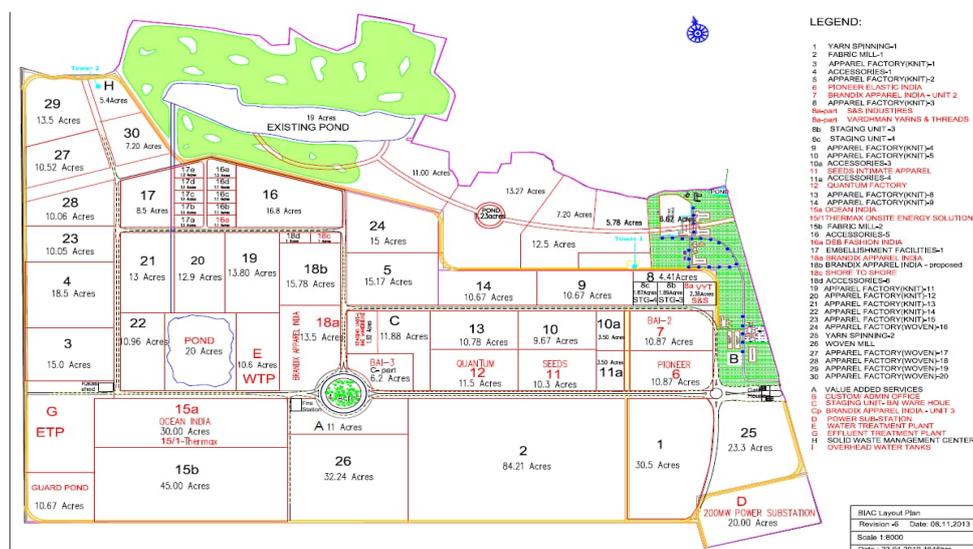
The two manufacturing blocks are designated as M1 and M2, whereas the L block houses the administration office, moulding, preproduction, cutting, and warehouse for storage of raw material and finished apparel product. The Block N is meant for utilities including a medical room and canteen. There is a separate room in N block, which is designated as

compressor and chiller room. There are three cooling towers behind the N block at a distance of 6 m from the N block as shown in Figure 1. The bus parking area is at the rear side (*north side*) of the M1 and M2 blocks. The rest rooms or washrooms were provided at the backside (north side) of M1 and M2 blocks. There is a chemical storage unit, which stores chemicals necessary for the chilling unit. A Diesel Generator set with a capacity of 1010 KVA (2 Nos) is installed and a diesel storage tank of capacity 15 KL exists.

The corridor between M1 and M2 is 6 meters wide and it is open to sky. The width of the open space on North side of M1 block is 15 m North side M1 to North compound wall) as shown in Figure 1.

M/s. Quantum Clothing India Pvt. Ltd., which is owned by Brandix India Apparel City (P) Ltd., located adjacent to the M/s. Brandix Intimate India (P) Ltd. was closed on 30.04.2022. The employees working in M/s. Quantum Clothing India Pvt. Ltd. were transferred to M/s. Brandix Intimate India (P) Ltd. on 01-06-2022. All the employees who worked earlier in Quantum are transferred now to BIIL and now majority are working in M1 block and a few of them are working in M2 block.

The Layout of M/s Brandix India Apparel City Pvt., Ltd, and the Google map indicating location of BIIL are shown in figure 2 & 3 respectively.



Atchuthapuram, Anakapalli District.



Figure – 3: Google map showing location of BIIL and surroundings.

4.1 The Air conditioning system: The working areas viz. M1, M2 and L blocks of M/s BIIL are centrally air-conditioned. The air conditioning system is described below:

The Air conditioning facility provided is chilled water HVAC system consists of a central chilling unit outside the building as shown in Figure 1. There are total eight Air Handling Units (AHU) catering the air – conditioning needs of both M1 (4 AHUs for M1) and M2 (4 AHUs for M2) blocks. The AHUs are located on the roof top of M1 and M2 buildings. The each of the AHUs provide fresh air inlet to draw outside air. The fresh air drawn through these inlets is mixed with the chilled air and circulated in the air conditioning system.

- Chilling room has one chilling plant and three No. of compressors in N block.
- 4 number of Air Handling Units (AHUs) are provided for each of the M1 and M2 blocks (two 75 TR AHUs are located at North side and the other two 80 TR AHUs are at south side of the blocks).
- Capacity of AHUs for each block is 80 TR AHUs (2 Nos.) – 34,400 CFM; 70TR AHUs (2 Nos) – 28,000 CFM.
- The lines numbered as 1,3,5,7,9,11,21,22 in the manufacturing blocks are connected to AHUs – 3 at South West side of M1.

- The lines bearing numbers 2,4,6,8,10,12 are connected to AHU – 4 at South East side of M1.
- The lines 13,15,17,19,23 are connected to AHU-2 at North East side of M1.
- The lines 14,16,18,20,24 are connected to AHU- 1 at North West side of M1.
- The AHU room size is 20.9ft x 16 ft.
- Fresh air damper of AHU size is 20 inch x 16 inch.
- AHU No.3 & 4 were installed on terrace slab of M1 building at South side at a distance of 5m from corridor lean to roof.



Air Handling Units (AHUs)

4.2 Statutory Permissions obtained:

The unit has obtained permissions from Factories Department, AP

State Disaster Response and Fire Services Department, Petroleum & Explosives Safety Organisation & A.P. Pollution Control Board The details of permissions granted and its validity are as below:

S. No	Permissions obtained by unit	Document/ license No.	Issue date	Valid upto	Name of the Department
1.	Factory license	44743	12.09.2011	Permanent license and no renewal involved	Factories Department
2.	Fire NOC	RC No. 8631	14.10.2022	13.10.2027	AP State Disaster Response and Fire Services Department
3.	PESO License	P/Hq/AP/15/3947 (P277636)	22.02.2021	31.12.2023	Petroleum & Explosives Safety Organisation
4.	CTO	Order No. 3829/APPC B/RO-VSP/2018-4814	27.09.2018	31.10.2028	A.P. Pollution Control Board

4.3 Process Description:

M/s. Brandix Intimate India (P) Ltd. is an apparel factory producing the apparels. It is engaged in manufacturing or knitting of Bras upto 39,800 numbers/day and Bralets upto 10,200 numbers/day. The factory receives fabric, elastic, hooks, PU cups, rings and slides, stickers, tags etc. as raw materials. Initially, as per the designs, the cutting of the fabric takes place in the L block. Then it is supplied to the M1 and M2 blocks where the workers stitch the fabric to make the final product and pack it. The packed product is sent to designated storage in L block. The major activity in the M1 and M2 blocks is tailoring. The approximate dimensions of the each of the M1 and M2 blocks are 80 m x 50 m. The ceiling is at a height of 5m at

eaves. The M1 and M2 blocks are centrally air-conditioned blocks where the temperature and humidity are maintained in the range of 25° C – 26° C and 55% - 60% respectively. The noise levels are measured during the field visit and the average noise level is 65 dB. The staff working in these blocks is exposed to these conditions for duration of approximately 7.5 hours in a working day. The production floor layout of the M1 and M2 blocks is shown in Figure 2.

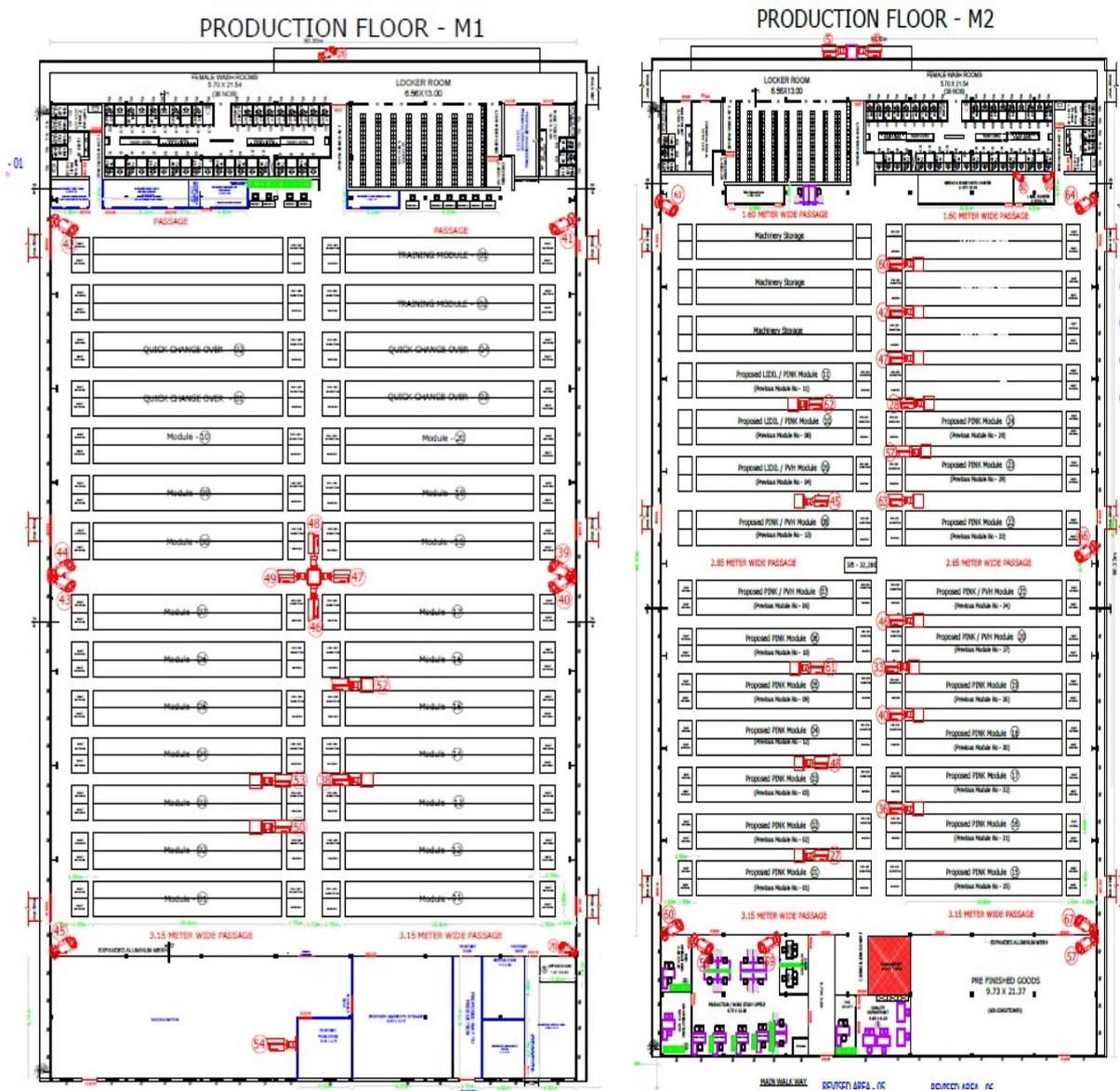


Figure 2: Production floor layout of the M1 and M2 blocks

5.0 Description of the incidents:

5.1 First Incident on 03.06.2022:

The first incident occurred on 03.06.2022 for a short duration of

about 10 minutes between 11.50 Am to 12.00 Noon. As reported by the management of the company, the employees of M/s. Brandix Intimate India (P) got affected due to inhalation of an unknown obnoxious gas and reported symptoms like vomiting, bowl irritation and breathlessness. Soon after hearing the widespread news of the incident, the District Collector, Anakapalli, the Superintendent of Police, Anakapalli, the Addl. Superintendent of Police, Narsipatnam, the Revenue Divisional Officer, Anakapalli, the Environmental Engineer & Assistant Environmental Engineer, APPCB, Visakhapatnam and I/c Inspector of Factories & Deputy Chief Inspector of Factories, Visakhapatnam rushed to the location and inspected the premises of M/s. Brandix Intimate India (P). The sequence of activities during first incident at BIIL are as below:

11:56:30 - Camera No. 45 (M1-Area 8) - Sewing line 1 towards Quantum. 2nd, 3rd, 4th, 5th and 6th employees witnessed smell.

11:56:30 – Camera -45 (M1 Area 08) – Line one, Associates 02, 03 and 04 (Yellow marked point at M1 block)

11:57:20 – Camera -43 (M1 Area 06) – Associates hurries towards exit

11:57:08 – Camera -10 (M1 – M2 corridor) – Associate had a vomiting sensation

11:57:09 – Camera -49 (M1 Area 12) – Bottom right two employees observe the smell

11:57:22 – Camera -60 (M2 Area 01) – Associate from the third line feels discomfort and few more associates in the same line

11:57:47 – Camera -41 (M1 Area 04) – Associate runs towards the exit

11:58:50 – Camera -57 (Packing) – All felt unpleasant smell

11:59:30 – Camera -27 (Cutting 02) – Female associate feeling dizzy

11:56:40 – Camera -04 (M2 backside 01) – Associate vomiting

The workers who were admitted into hospitals day wise were given in table No.1.

Table No.1: Day wise admission of workers into Hospital

Day wise Hospital details				
Date	M1	M2	L Building	Day wise admissions
03.06.2022	92	81	22	195
04.06.2022	76	60	22	158
05.06.2022	20	16	2	38
06.06.2022	7	6	4	17
07.06.2022	0	0	0	0

08.06.2022	0	0	0	0
09.06.2022	1	1	0	2
10.06.2022	0	0	0	0
12.06.2022	0	0	0	0
Total	196	164	50	410

5.2 Second Incident on 02.08.2022:

After two days of the joining of workers from M/s Quantum Clothing India Pvt. Ltd. into the M/s. Brandix Intimate India (P), the first incident occurred on 3-6-2022. After the first incident, the activity in the M1 building was closed till 15.06.2022 and the work in the M1 block of BIIL was resumed on 16.06.2022. The management of the M/s BIIL stopped chemical spraying for pest control work after the first incident (03.06.2022). After a gap of 59 days again the fumigation process was restarted on 01-08-2022. The Beta Cyfluthrin 2.45% SC (SC: Suspension Concentrate) chemical was used for fumigation of the outside the premises. Moreover, subsequent to the first incident, the management decided to spray the pest and insect control chemical during the night times after completion of the B or second shift (from 2.00 PM. to 10.00 PM). Accordingly, on 01-08-2022, Beta Cyfluthrin 2.45% SC was sprayed for pest control from 11.00 PM after the B shift. The chemical for pest control was sprayed for a total duration of approximately 3 hours. The pest control operator had sprayed the chemical at the verandah and outside the M1, M2, L and N blocks. The workers, who came to work on 02-08-2022 for the first shift from 6.00 AM to 2.00 PM, did not feel/sense any odor or smell. After their shift by 2.00 PM, they went back to their homes safely.

The other group of workers who came for the B or second shift started feeling the smell or odor from around 6:40 PM. Normally, the workers in the B shift take a break and go to the canteen in two spells. The 1st spell is from 6.00 PM to 6.30 PM and 2nd spell is from 6.40 PM to 7.10 PM. The workers who went for dinner break during the 1st spell were not affected and didn't sense any smell except a few who returned to the M1 block after completion of the first break. They completed their break for snack / dinner from 6.00 PM to 6.30 PM and returned to their duty. The workers, during the dinner

break for second spell, came out from M1 block at about 6.30 PM from north side exit for going to the rest rooms besides collecting their dinner / snack boxes from lockers on the northern side of the M1 block. During this period, these workers have sensed an unpleasant odor or smell initially at lockers area and in the verandah and open space abutting the lockers area around 6:40 PM. A little later, some of the workers, who had been exposed to the odor, experienced nausea and vomiting sensation. Immediately, these workers have been moved to a safe place towards neighboring factory on west side i.e. M/s Quantum Clothing India Pvt Ltd. From there, some of the workers were shifted to the nearby hospitals and others were shifted to their homes by buses. Some of the workers, who had uncomfortable symptoms while going home, were also joined in the nearby hospitals. A total 129 workers were admitted in different hospitals located in Anakapalli and Atchyuthapuram. The details are shown in Table 2. The sequence of activities during second incident at BIIL are as below:

18.43 PM : In the mid bay (corridor) of M1 and M2, one worker from M1 block while going to canteen area sensed an unpleasant smell.

18.47 PM : Another worker from the M1 block complained about the smell to welfare officer.

18.55 PM : Unit Engineering, safety, HR and other teams also felt the smell in the mid bay area and checked for other areas.

19.00 PM : It was observed that a smell had been felt in midway exit areas (corridors) and no smell was experienced in other areas viz. inside the M1, M2, and L blocks, the entrance security gate area of the BIIL and the open spaces at other locations.

19.20 PM : All the areas were checked continuously for detection of smell and all the AHUs and AC's were switched off as a precautionary measure.

19.20 PM : One worker was taken by wheel chair to medical room (OHC).

19.22 PM : Another worker moved from M1 and M2 path ways to medical room.

19.28 PM : Another worker reported from lockers area to medical room and another associate reported from M1 path way to medical room.

19.45 PM : One more worker started vomiting and ambulance was made ready.

19.46 PM : First patient moved from the factory to Medirise Hospital, Atchutapuram by ambulance.

20.00 PM : Few more workers started complaining about vomiting, headache and dizziness. Stated evacuation of workers and shifted sick employees to nearby hospitals and got logistic support from all other Brandix units.

21.00 PM : The shift operations were suspended in all areas of the unit and started sending all the workers to their homes.

The workers who were admitted into various hospitals were discharged within a day after medical treatment. The district administration reacted promptly and reached the incident site. They along with the factory and M/s Brandix India Apparel City personnel assessed the situation and took care of the affected persons.

Table 2: No. of Workers Admitted in Different Hospitals

S. No.	Hospital Name	No. of workers admitted
1.	NTR	43
2.	Usha Prime	46
3.	Satyadev	14
4.	Medirise	15
5.	SreeVaibhav	6
6.	Starzen	5
	Total	129

The affected people were provided medical treatment and the needy people were admitted in to different hospitals. The officials of Director of

Factories, AP Pollution Control Board, Revenue, Police and other departments at the district level looked into the incident issues and conducted studies. Apart from the above government machinery, the premier institutions involved in the study to analyze the incident scenario include NIE, NIN, etc.,

5.3 Chronology of incidents:

The Chronology of incidents is described as follows:

S.No.	Date	Event
1.	03.06.2022	An incident took place at the premises of M/s. Seeds Intimate Apparel India Pvt. Ltd., located at Plot No.11 of M/s.Brandix India Apparel City Pvt. Ltd., SEZ, Pudimadaka Road, Atchtuthapuram, Anakapalli District on 03.06.2022 between 11:50 AM to 12:00 Noon. As reported by the management of the company about 410 employees of M/s.Seeds Intimate Apparel India Pvt. Ltd., got affected due to inhalation of an unknown toxic gas and reported symptoms like vomiting, bowl irritation and breathlessness.
2.	03.06.2022	The District Collector, Anakapalli constituted District Level Committee comprising of: <ol style="list-style-type: none"> 1. Joint Collector, Anakapalli – Chairman, 2. Environmental Engineer, APPCB - Member Convener, 3. Revenue Divisional Officer, Anakapalli – Member, 4. Deputy Chief Inspector of Factories- Member, 5. Dy. Commissioner of Labour, Anakapalli –Member, 6. Addl. Superintendent of Police, Narsipatnam – Member, 7. Dr. P.J.Rao, Retd. Professor, Dept. of Chemical Engineering, AU, Visakhapatnam – Member, 8. Prof.P.Rajendra Prasad, Dept. of Chemical Engineering, AU, Visakhapatnam – Member. 9. Md. Yaswen, Managing Partner, air 'n' gas Controls – Member
3.	03.06.2022	APPCB collected air samples within the premises of M/s. Seeds Intimate Apparel India Pvt. Ltd., and dust sample from the AHU ducts and submitted to IICT, Hyderabad for analysis.

4.	03.06.2022	The unit stopped its operations.
5.	04.06.2022	APPCB constituted a Committee comprising of 1. Joint Collector, Anakapalli District, 2. Joint Chief Environmental, ZO, APPCB, Visakhapatnam, 3. Inspector of Factories Visakhapatnam, 4. Zonal Manager, APIIC, Atchutapuram, Visakhapatnam
6.	06.06.2022 & 07.06.2022	Both the Committees have visited the incident site i.e., M/s.Seeds Intimate Apparel India Pvt. Ltd, CETP of M/s. Brandix Apparel India (Pvt) Ltd (BIAC) & incinerator within the premises of BIAC and surrounding industries viz., M/s.Porus Laboratories Private Limited (Unit-VI), M/s.Atchutapuram Effluent Treatment Limited (AETL), M/s. Solara Active Pharma Sciences Limited & M/s. Toyotsu Rare Earths (India) Private Limited.
7.	08.06.2022	IICT, Hyderabad furnished analysis report. As per the report the air and dust samples contain various chemicals such as acetonitrile, dichloromethane, ethyl acetate, n-hexane, toluene, chloromethane, cyclopropane, acetaldehyde, furan, acetone, 2-methyl propanal, n-butanol, 2-methyl furan, 2-butanone, benzene, 2,3 butanedione, 2-methyl butanol, Chlorpyrifos.
8.	10.06.2022	Both the Committees jointly submitted a detailed report to the Government. The Committees concludes that the incident took place due to spraying of Chlorpyrifos 20% EC between the production blocks and the accumulated vapours underneath the roof were sucked into the inlets of 4 ducts of air handling units installed in M1 and M2 blocks, thereby leading to the incident.
9.	19.07.2022	As per the advice of the State Government, the APPCB on 19.07.2022 addressed the Director, National Institute of Epidemiology (ICMR), Chennai for willingness to enquire into the incident to identify the route cause for large number of employees affected with symptoms of vomiting, irritation, breathlessness due to the above incident took place on 03.06.2022.

10.	02.08.2022	Second Incident took place in the same premises of M/s. Seeds Intimate Apparel India Pvt. Ltd., in between 6.30 PM to 07.45 PM.
11.	02.08.2022 & 03.08.2022	APPCB Officials collected air samples from the inside & outside premises of M-1 & M2 Blocks (during AHU on/off condition) and also at toilet and corridor between M1 & M2 blocks and collected the samples of air filter dust from all Air Handling Units (AHU) installed on the top of M1 & M2 blocks and also collected the samples of dust deposited on the AHU ducts in M1 & M2 blocks of M/s.Seeds Intimate Apparel India Private Limited for analysis.
12.	03.08.2022	The Hon'ble NGT constituted a six-member Joint Committee headed by Chairman State PCB with Regional Director, CPCB, nominee of NDMA, Prof. P. Jagannadha Rao, Department of Chemical Engineering, Andhra University, Visakhapatnam, District Magistrate, Anakapalli. Director Industrial Safety, Andhra Pradesh and Indian Institute of Chemical Technology, Hyderabad.
13.	03.08.2022	Government of Andhra Pradesh, Vide G.O.Rt.No.78, constituted the Expert Committee with senior experts from ICMR, Hyderabad, IICT, Hyderabad and Central Forensic Science Laboratory, Hyderabad to probe into the cause behind the gas leak and suggest measures to improve the protocol for industrial safety within the 30 days.
14.	05.08.2022 & 06.08.2022	ICMR- NIE (<i>National Institute of Epidemiology</i>), Chennai team and ICMR-National Institute of Nutrition (<i>NIN</i>), Hyderabad team conducted the visits.
15.	16.08.2022	CSIR-IICT, Hyderabad furnished analysis report. As per the analysis report, the dust and air sample indicates the presence of Chlorpyrifos in minor quantity.
16.	01.09.2022 & 02.09.2022	Committee constituted by Hon'ble NGT visited the site of M/s. BIIL and surrounding industries.
17.	02.11.2022	The Committee submitted first interim report to Hon'ble NGT.

18.	15.11.2022	M/s Brandix Intimate India Private Limited submitted an undertaking to the District Level Committee that they will comply with all the recommendations made by the District Level Committee before carrying on process work and also ensured to comply with directions of Hon'ble NGT in OA No.448 of 2022 from time to time.
19.	28.11.2022	M/s Brandix Intimate India Private Limited started the operations in M1 block.
20.	02.12.2022	ICMR – NIN, Hyderabad and ICMR – NIE, Chennai jointly submitted investigation report. As per the report, the community diagnosis is “The clinical picture and epidemic pattern are characteristic of a common source, single exposure outbreak. The acute clinical signs and symptoms were suggestive of inhalation of organophosphate insecticide. The biomarker of Imidacloprid, an Insecticide, were found in four samples among the exposed”. This is suggestive of inhalation of Imidacloprid Insecticide, but the source of exposure might be accidental or incidental”.

6.0 Factual Observations of Committee:

The NGT Committee visited the site on 1st and 2nd September 2022 to ascertain the issues related to the incident occurred on 2nd August 2022. The Committee, during its visit, has visited 14 factories in the Brandix Apparel city and interacted with workers and senior management team. The Committee has collected the additional information and secured the line department findings like Factories Department and APPCB etc., The footages of both the incidents from the strategically located cameras out of the total 70 CC cameras installed in the factory premises were also secured. The Committee has later conducted hybrid meetings on different dates and all these evidences were examined by the Committee. The following are some of the details of the investigations by Factories Department and other industries located within M/s Brandix Apparel India Pvt. Ltd.:

6.1 Investigation of Inspector of Factories about First Incident:

- i. Intoto Pest Control and Facility Services, a pest control agency which was engaged by M/s. Seeds Intimate Apparel India Pvt. Ltd. On behalf of the agency Sri M. Gangaraju. Pest Control Operator is regularly engaged in spraying pesticide in & around the plant premises.
- ii. Sri M. Gangaraju, in his written-statement revealed that he comes everyday and collects 25-30 ml of chemical from the chemical storage room located in N-Block and dilutes with 3-Itrs of Water in 5 ltrs capacity spraying can. He proceeds this spraying of diluted pesticide covering all the blocks and sprays outside the blocks. The Committee (*constituted by District Collector, Anakapalli*) has collected a sheet which contains the block wise spraying details along with time completion and signatures of respective managers of the sections.
- iii. The agency is using two chemicals for pest control viz., Alpha Cypermethirin 10% SC for pest management inside the facilities and blocks and Chlorpyrifos 20% EC for use in open areas.
- iv. During the visit, the Committee (constituted by District Collector, Anakapalli) was informed that there was no stock of Alpha Cypermethirin 10% SC on the day of incident and the pest control operator has applied Chlorpyrifos 20% EC instead of Alpha Cypermethirin 10% SC in between the production blocks. The 6 m corridor between L block and M1, M2 & N blocks is covered with a lean to roof GI sheeting .The height of the roof at L block shed is 7.5 inches and the height of eaves on slab of M1, M2 & N block is 6.41 m. There is a gap of 1.5 m between the slabs of M1, M2 & N and roof sheet. There are two AHUs on the roof of M1 block and two AHUs on M2 block at south side of blocks. The fresh air inlets of all 4 AHU units are located near the opening of the lean to roof. It appears that due to suction of chlorpyrifos 20% EC sprayed in that area might have been sucked through fresh air inlet of air handling unit (AHUs) and in turn into the production

- area where the incident occurred.
- v. As per the composition, solubility of Chlorpyrifos 20% EC in water is 2 mg/l and at the time of spraying at the incident site the final concentrated residue may have settled down in the sprayer due to improper mixing and the concentrated chemical might have been sprayed at the site leading to the occurrence of the incident.
 - vi. It was reported by the pest control operator that a few days prior to the incident the stocks of Alpha cypermethrin 10% SC meant to be used inside the block was exhausted and that he had asked Sri Sekhar, Supervisor of agency for additional stock who instructed the pest control operator to use a transparent bottle filled with a light yellow coloured liquid (*Chlorpyrifos 20% EC*). The copy of written statement given by the pest control operator and job cards /service acknowledgement for M/s Seeds Intimate Apparel India Pvt. Ltd.
 - vii. The statement obtained from the pest control operator Sri M.Gangaraju stating that the pest control was done from 09:00 AM to 11:24 AM on the day of incident i.e. on 3.6.2022 at various-facilities including the semi closed corridor area between the M1, M2, N and L Blocks.
 - viii. There is a lean to roof of GI sheet found on the slabs of M1, M2 & N blocks L block there is 6 m wide corridor between M1, M2 & N blocks and L building. The pest control operator usually spraying along the walls of L Block and return along the walls of M1, M2 & N blocks, As the 6 meters corridor with the length of about 150 meters is sprayed twice and the entire gases/vapour generated from the spray is accumulated at lean to roof from there the accumulated gases passed through the gap between the roof and walls of M1, M2 & N blocks.

The investigation report of Inspector of Factories is enclosed as **Annexure - 3**

6.2 Investigation of Inspector of Factories about second Incident:

- i. On 01-08-2022 at about 10:30 PM, Sri. Koviri Mutyalu, age 29 years, who has been working as pesticide and insecticide spraying operator from the contracting agency of M/s. Pest Cure Solutions & Fumigation, sprayed Beta Cyfluthrin 2.45% SC solution prepared using 50 ml of the chemical in 05 liters of water all along bottom corner of the outside walls of L, M1, M2, and N Blocks.
- ii. At the time of incident, there were 940 workers in M1 block, 727 in M2 Block and 254 in L block and a total of 1921 workers present in the factory.
- iii. Out of the 129 female workers who were hospitalized, 122 employees were workers from M1-Block and 07 workers from M2 Block.
- iv. The Pollution Control Board authorities from Visakhapatnam office collected air and dust samples from different locations. Dust samples from air filters, ducts of air handling system at different locations in M1 block. The air inside the M1 block was sampled using air bags and sorption tubes. These samples were sent to IICT laboratory, Hyderabad for parametric analysis. After the incident PCB authorities seized the M1 block.
- v. During the course of enquiry by the officials of factories department it was observed that the covers over the soak pits and other drains (storm water pits) were opened near the chemical room. It was further observed that a soak pit (30 cm x 30 cm x 60 cm approximately) has not been cleaned for few weeks and observed foul odor. There are 117nos. of wash rooms present in the factory and the sewage generated is being conveyed through sewer lines and reach the common effluent treatment plant located on South-West corner of BIAC.

The investigation report of Inspector of Factories is enclosed as **Annexure - 4**

6.3 Internal grudge between workers:

Inspector of Factories report stated that some internal issues in the factory prior to the incident were observed. From 01.06.2022 onwards 2446 workers were taken into Brandix Intimate India Pvt. Ltd from nearby Quantum Clothing India Pvt Ltd in which operations were terminated due to financial crisis. Initially workers from Quantum Clothing India Pvt Ltd refused to work in Brandix Intimate India Pvt. Ltd., but the management of the factory persuaded them by assuring provision of required amenities to them. The associates from Quantum (operators, quality and supporting workers) were engaged in M-1 building. Staff and executives were allotted to concerned departments based on hierarchy. At the time of assigning roles, there was resistance from some departments especially from RMWH (Raw Material Ware House) department workers. By conciliating the employees from both the units, job roles were assigned accordingly. The 120 numbers of workers from RMWH department were taken to Kondakarla Ava Lake on 24.07.2022 as a part of outbound training program and a picnic like program was arranged to conciliate and alleviate the apprehensions of the workers from both the units.

6.4 Other industries located in the M/s Bradix India Apparel City:

There are several industries around the BIIL in the Atchutapuram SEZ. The factories located within 1km radius of this factory were verified. The details of the nearest factories are given below.

The factories on East side:

1. Rain CII Carbon (*Vizag*) Limited
2. Uniparts India Limited
3. Pioneer Elastic India Pvt Limited

The factories on North side:

1. Pilkington Automotive India Pvt. Ltd.

The factories on West side:

1. ATC Tyres AP Pvt. Ltd.
2. Brandix Apparel India (P) Ltd. Unit - I

3. Teejay India Pvt Ltd.
4. Quantum Clothing India (P) Ltd.
5. Brandix India Apparel City (P) Ltd. ETP and

The factories on South side:

1. Solara Active Pharma Sciences Limited
2. Porus Laboratories Pvt.Ltd.
3. Toyotsu Rare Earths India (P) Ltd.

Pilkington Automotive India Pvt. Ltd factory is located on north side. The factory produces windshields of cars and trucks. Black ink is used to design the wind shield glasses. The ink is black in color having a flash point is 90°C (ISO 3679). It is not explosive and do not cause hazardous reactions. However, it has irritant effect on skin and eyes. The factory is also having N.C thinner D13 – X solvent which is used to clean the wind shields. The thinner is prone to fire and explosion hazard. Between these two factories, the Brandix officers' quarters are located. The odor problem was not reported by the residents of the quarters or the officers and staff of the automotive company as stated by them.

On western side, ATC Tyres AP Pvt. Ltd., Unit – I of Brandix Apparel India (P) Ltd., Teejay India Pvt Ltd., Quantum Clothing India (P) Ltd., and ETP of Brandix India Apparel City (P) Ltd. are located. Last year, Quantum Clothing India (P) Ltd. which is a garment manufacturing unit closed its operations. Brandix 1 is also a garments manufacturing unit involved in cutting and stitching of fabric to produce apparels. Teejay India (P) Ltd., whose manufacturing activities are knitting and dyeing of fabric, is located within a radial distance of 1 Km. The main chemicals used are Hydrogen Peroxide of 30% concentration which is a strong oxidizer with a health hazard rating of 3 as per the NFPA 704 and Acetic acid which is also stored in the premises, its NFPA hazard rank being 3-2-0 besides corrosion. Both are stored up to a maximum of 2 MT only at ambient conditions.

On Eastern side, there are 4 units as stated earlier. M/s Uniparts India Ltd. located within a radial distance of 1 Km which produces precision machined parts. M/s Uniparts India Ltd. uses hazardous material such as Propane (*up to 32 MT storage*). The NFPA for Propane is 2-4-0. Pioneer Elastic India Pvt Ltd is located within a radial distance of 0.3 Km. The factory is manufacturing elastic ware for use in bras and bralets. Rain CII Carbon Vizag Ltd. is located within a radial distance of 1 Km and it produces Calcinated Carbon. Aqueous Ammonia of 24% concentration is stored up to a storage capacity of 630 KL with the NFPA classification of 3-1-0. Emissions of ammonia gas, very toxic in nature, may be from the storage vent at ambient conditions. As per the preliminary report, no smell was sensed in this factory on 02-08-2022.

The industries located in the south side of the incident area are already listed earlier. M/s. Porus Laboratories Private Limited (*Unit – VI*) is situated toward southern side from the site of incident at a radial distance of approximately about 550 m. The industry is manufacturing Agrochemicals and Specialty chemicals. M/s. Atchutapuram Effluent Treatment Limited (AETL) unit is situated towards South – East side from the site of incident and it is at a radial distance of about 2.0 Km. It is a common effluent treatment plant run by APIIC to treat the effluents generated and collected from members industries of APSEZ, Atchuthapuram. Often some VOC emissions within the premises of AETL are used to be observed in and around the AETL premises. M/s. Solara Active Pharma Sciences Limited is an industry situated towards South – West side from the site of incident at a radial distance of about 600 meters. It is manufacturing API and Bulk Drugs. M/s. Toyotsu Rare Earths (*India*) Private Limited is situated towards South side from the site of incident at a radial distance of about 600 m. The industry is manufacturing the oxides & carbonates of Rare earth elements.

The main Hazardous chemical factories are located on South side of the factory. The BIIL management has installed 6 gas detectors for detecting Carbon Monoxide, Formaldehyde, Total VOC, Ammonia, Chlorine, Methyl

Mercaptan gases near the factory main gate which is at South West corner of the factory. The unpleasant odor/smell was sensed by the workers on north side of the factory. But, the detectors have not detected any gas present in the ambient air near security gate.

6.5 Status of Onsite & Offsite Emergency Plans and Mock Drills conducted:

The Rule 13 of the Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 (*MSIHC Rules 1989*) prescribes the requirement of preparation of Onsite Emergency Plan by the occupier of an industrial activity and Rule 14 of MSIHC Rules 1989 prescribes the requirement of off-site emergency plan by the District Administration for dealing with emergencies in connection with the industrial activities having the hazardous chemicals with more inventory than that prescribed in column 3 of Schedule 3 of the said rules.

But the present factory M/s Brandix Intimate India Pvt Ltd (*formerly known as M/s Seeds Intimate Apparels India Pvt Ltd*) is carrying a non-hazardous process without any hazardous chemicals, thereby does not qualify under the rules for the above requirement of Onsite and Offsite emergency plans for this industry.

6.6 Investigation conducted by various Departments:

- i. **District Administration:** The District Collector, Anakapalli constituted a Committee comprising of Joint Collector, Environmental Engineer, APPCB, Revenue Divisional Officer, Anakapalli, Deputy Chief Inspector of Factories, Dy. Commissioner of Labour, Anakapalli, Addl. Superintendent of Police, Narsipatnam, Prof. P.J. Rao, Dept. of Chemical Engineering, Andhra University, Visakhapatnam, Prof. P. Rajendra Prasad, Dept. of Chemical Engineering, Andhra University, Visakhapatnam and Md. Yeswen, Managing Partner, Air 'n' Gas Controls to investigate the incident happened. The detailed report is annexed

as **Annexure – 5**. The Committee concluded that the source of toxic gas was from the premises of M/s Brandix Apparel India (P) Ltd., due to spraying of Chlorphyriifos 20% EC between the production blocks and the accumulated vaporous underneath the roof were sucked into the inlets of 4 ducts of Air Handling units installed in M1 & M2 Blocks, thereby leading to the incident. And also reported that except in the premises of M/s. Brandix Intimate India (P) Ltd (BIIL) (*formerly known as M/s. Seeds Intimate Apparel India (P) Ltd*) no other persons of the companies in the vicinity felt any symptoms / smell which was noticed by the employees of BIIL.

- ii. **AP Pollution Control Board:** Officials of APPCB collected residual air and residue samples on the day of incident i.e., on 03.06.2022 from inside the shed near line – 1, inside the shed near line – 7, outside the shed near fresh air inlet and dust samples collected from AHU ducts inside the sheds and from fresh air inlet filter of Air Handling System (AHU) in M1 block in the premises of M/s Brandix Apparel India (P) Ltd., and are submitted to IICT, Hyderabad for analysis and also APPCB monitored Ambient Air Quality within the industry premises using Mobile CAAQM station on 24 Hrly basis for five days period i.e., from 08.06.2022 to 13.06.2022. As per the data generated, the ambient air quality parameters (*CO, O₃, NO, NO₂, NH₃, SO₂, PM_{2.5}, PM₁₀*) were within the NAAQS norms. As per the analysis report of IICT the air and dust samples contain various chemicals such as acetonitrile, dichoromethane, ethyl acetate, n-hexane, toluene, chloromethane, cyclopropane, acetaldehyde, furan, acetone, 2-methyl propanal, n-butanol, 2-methyl furan, 2-butanone, benzene, 2,3 butanedione, 2-methyl butanol, Chlorphyrifos.

Upon second incident on 02.08.2022 collected air samples from the inside & outside premises of M1 & M2 blocks (*during AHU on / off condition*) and also at toilet and corridor between M1 & M2 blocks and collected the samples of air filter dust from all Air Handling

Units (AHU) installed on the top of M1 & M2 blocks during the period from 02.08.2022 to 03.08.2022. And also collected the samples of dust deposited on the AHU ducts in M1 & M2 blocks of M/s Brandix Apparel India (P) Ltd., for analysis. The samples were submitted to IICT, Hyderabad on 03.08.2022 for detailed analysis of VOCs, Methane, Monomeththylamine, Propadine, Ammonia, Mercaptans and pesticides residues viz., Chloriphyrifos, Cypermethrin, Deltamethrin, Beta-Cyfluthrin. However as per the analysis report, pesticide residues of Chloriphyrifos were present in dust samples collected in AHU ducts of M1 & M2 blocks. Action taken report of Environmental Engineer, APPCB, Regional Office, Visakhapatnam dt.06.12.2022 on First incident and Second incident along with Air Quality reports of APPCB and IICT is enclosed as **Annexure – 6**.

- iii. **ICMR, NIN & NIE:** The APPCB requested ICMR-NIN on behalf of Govt. of Andhra Pradesh to investigate into the sudden unknown illness of employees of M/s. Seeds Intimate Apparel Pvt. Ltd wherein women employees were admitted in Govt. & Pvt. Hospitals of Anakapalli District. The Director NIN constituted a multi disciplinary team to conduct outbreak investigation. Another team was also constituted by Dr. Manoj Murekar, Director, ICMR-National Institute of Epidemiology as per the request of APPCB. The teams visited the factory, observed CC TV footage, visited hospital and collected blood and urine samples and also conducted in depth interviews with patients and treating doctors etc., ICMR – NIN, Hyderabad and ICMR – NIE, Chennai jointly submitted investigation report. As per the report, the community diagnosis is

“The clinical picture and epidemic pattern are characteristic of a common source, single exposure outbreak. The acute clinical signs and symptoms were suggestive of inhalation of

organophosphate insecticide. The biomarker of Imidacloprid, an insecticide, were found in four samples among the exposed”.

This is suggestive of inhalation of Imidacloprid Insecticide, but the source of exposure might be accidental or incidental”. The detailed report is enclosed as **Annexure – 7**.

- iv. **Police Department:** Upon receiving information that some unknown gas was leaked from the Seeds Company of Brandix, Atchuthapuram and some of the workers of that company are effected with vomiting and irritative smell and complaint lodged by Sri Lalam Ravi, S/o Somu Naidu, the Superintendent of Police, Anakapalli instructed Inspector of Police, Yalamanchili Circle to investigate the incident. Accordingly, investigation has taken on 03.08.2022 and the detailed report is enclosed as **Annexure – 8**. In the Police investigation report, it was stated that “On verification of CC footages, it is clear that no person is found on suspicious manner in the premises of M/s Brandix Apparel India (P) Ltd., on the day of incident”. The Investigation Officer (IO) asked APPCB, Visakhapatnam and Inspector of Factories to visit the company and to furnish the information. And also given instruction to Medical Officer of various Hospitals to treat the victims and to furnish the information on type of gas of their treatment. IO also collected sample of food material from the Seeds Company and canteen which food was eaten by the workers and send the same to the Asst. director, RFSL, Visakhapatnam with request to analyze the food material. IO also addressed a letter to Joint Director, Agriculture Department, Anakapalli for their report on above chemical used for pest control.

7.0 Recommended remedial measures to prevent such incidents:

Based on the field observations about prevailing working condition, involvement of huge manpower, the Committee suggests following remedial measures to prevent such accidents;

- i. The unit should have proper ventilation system as per the guidelines of Industry and Factories Act
- ii. Any pest/insecticide control fumigation should be taken when no workers in the working place. On application of pesticide/insecticide proper time has to give for dilution and should not impact on any workers.
- iii. The unit should ensure the certified pesticides/insecticides application in inside of the building to avoid any unforeseen circumstances in future.
- iv. The pest/insecticide control fumigation should be taken under the guidance of qualified/trained person who has knowledge about proper ratio of mixing rate of application etc.,
- v. The accessibility of air handling unit to be restricted to only maintenance personals and no other persons are allowed in the area.
- vi. The unit should give proper and periodical mock drill training to all workers to enable them to safeguard their health & life in case of any unforeseen situations.
- vii. Periodical medical examination of workers shall be conducted

8.0 Concluding Remarks of Committee:

The Committee visited the site / location of incidents, the surrounding areas, factories in the Brandix apparel park. The Committee examined the information collected, various reports submitted on the incident and the CC camera footages and the interactions with victims etc.,. Based on these, there are multiple external and internal sources that could have lead to the incident. Some of these are given below:

- a. In the first incident (*occurred on 03.06.2022*), the IICT chemical analysis of various air and dust samples collected from the area inside the shed and the air handling system of M1 and M2 buildings of

M/s.Brandix Intimate India (P) Ltd (*BIIL*) (*formerly known as M/s.Seeds Intimate Apparel India (P) Ltd*), shows the presence of several chemicals like acetonitrile, dichloromethane, ethyl acetate, n-hexane, toluene, chloromethane, cyclopropane, acetaldehyde, furan, acetone, 2-methyl propanal, n-butanol, 2-methyl furan, 2-butanone, benzene, 2, 3 butanedione, 2-methyl butanol, Chlorpyrifos. On the other hand, The ICMR-NIN & ICMR-NIE, as mentioned in their report, observed that the clinical picture and the epidemic pattern are characteristic of a single exposure outbreak. The acute clinical signs and symptoms were suggestive of inhalation of organophosphate insecticide. The bio marker of Imidacloprid, an Insecticide, were found in four samples among the exposed samples taken from 52 people. This is suggestive of inhalation of Imidacloprid. But as per the statement recorded from Sri K. Muthyalu, the pest control contract worker during investigation by Factories Department, it was found that the insecticide used on 01.08.2022 night was “Beta Cyfluthrin” but not Imidacloprid. This requires a more detailed probe and analysis.

- b. The CC camera footage shows the execution of pest control activity by the concerned person across the outdoor and indoor areas like M1 block, M2 block, L block etc., at the corners of walls and floor on 03.06.2022 between 9 am to 11 am when all the workers were present at their respective work places. None of them have been found depicting any sign of sensing the smell or feeling inconvenience etc., due to application of insecticides very close to them during the application of the pesticide. The statement recorded by the Factories Department from Sri M. Gangaraju who applied the insecticide on 02.06.2022, it is clear that there was no stock of the pesticide “Alpha Cypermethrin 10%EC” which was intended for indoor spraying since 01.06.2022. It is further clear that the pesticide “Chlorpyrifos 20% EC” was used for inside and outside spraying also. In this background, it needs to be ascertained as to whether pesticides being used and their concentrations and dilution with water can create any

impact on the workers that too in a scenario, as could be seen from CC footage, where the person applying spray was continuously walking with the sprayer gun thereby not facilitating the accumulation of concentration of pesticide at any given spot. This has to be juxtaposed with the deposition of the Welfare Officer Mrs Lavanya, who was around the incident scene. She was found to be comfortable in CC footages on 02.08.2022. The Committee interacted with her and she stated to the Committee that the number of workers who were affected at the incident area were few. After a while, she went to her place of work i.e., M1 block and found all the workers have gone to neighboring factory premises called M/s Quantum Clothing India Private Limited. She also went to the said neighboring factory. When she reached there, she was shocked that several workers had started exhibiting symptoms of toxic exposure in a premises where hardly smell was reported and everything seemed normal.

- c. The sequential connectivity has to be established in the behavior of the workers as to how the incident can trigger and spread in the way it was shown in CC footages.
- d. As per the investigation conducted by the Committee constituted by the District Collector, Anakapalli concluded that spraying of Chlorpyrifos 20% EC between the production blocks and the accumulated vapors underneath the lean to roof were sucked into the fresh air inlet ducts of 4 air handling units installed on slab of M1 & M2 blocks there by leading to the incident. Thus, it has to be confirmed if the concerned air emissions released from the solution in liquid form (*consisting of 1ml pesticide chemical in 100 ml of water*) and the dispersion characteristics of the emissions led to the incident.

In view of the above observations, the Committee unanimously felt the need for conducting a separate and in-depth study of all the industrial activities of the factories around up to 1 km from M/s.Brandix Intimate India (P) Ltd (BIII) (formerly known as M/s.Seeds Intimate Apparel India (P) Ltd),. This study will help the Committee in understanding and assessing possible scenarios, which can result into such incidents, which have happened, in Brandix Intimate India Pvt. Ltd.,. This study will also help in ruling out certain probabilities for these incidents, which in turn helps the Committee to move closure to the conclusion at the earliest. The Committee has also expressed that the Andhra University at Visakhapatnam, being one of oldest and one of the best-rated Universities in the Country, may be requested for carrying out this study with a time line of 3 months. Therefore, it is humbly prayed that an additional time of 4 more months may be granted to the Committee for submission of final report in this matter.


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