Item No. 03 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No. 60/2021

(With report dated 17.04.2021)

In re: News item published in The Hindu dated 23.02.2021 titled "**Two dead, 5 missing in fire at UPL Plant**"

Date of hearing: 11.06.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SUDHIR AGARWAL, JUDICIAL MEMBER
HON'BLE MR. JUSTICE M. SATHYANARAYANAN, JUDICIAL MEMBER
HON'BLE MR. JUSTICE BRIJESH SETHI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Respondent: Mr. Raj Kumar, Advocate for CPCB
Mr. Ankit Virmani, Advocate and Ms. Manasi Kumar, Advocate for UPL Ltd.
Mr. R.R. Vyas, RO, GPCB

ORDER

Introduction and procedural history

1. Proceedings have been initiated in the present matter on the basis of the media reports dated 23.02.2021 published in 'The Hindu' under the heading "Two dead, 5 missing in fire at UPL plant".[1] It is reported that fire broke out at 1.35 am on February 23 at UPL Ltd (United Phosphorus Ltd) after a blast and major fire at the company's Jhagadia plant which claimed two lives and injured 26. Five labourers are still missing. The unit was shut since February 5 for a planned annual boiler inspection. The Labour and Employment Department of Gujarat Government issued closure notice to the unit. The unit was directed by

[1] https://www.thehindubusinessline.com/news/national/fire-breaks-out-at-upls-jhagadia-plant-in-gujarat/article33910072.ece

the Gujarat Government to pay ex-gratia compensation to the next of the kin of the deceased workers. The report also gives version of the company that there was no chemical reaction as the plant was shut. Fire may have been caused due to fire/explosion in the solvent which could have been caused due to electric short circuit.

2. The matter was earlier considered on 25.02.2021 and it was found necessary to require status of compliance of the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 ("the 1989 Rules") and Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 (The 1996 Rules) with a view to determine steps required to be taken for compensating the victims and restoration of the environment and preventing such occurrences in future. While issuing Notice to the UPL Ltd., Jhagadia, District Bharuch, Gujarat, Director, Industrial Safety and Health (DISH), Gujarat State PCB, CPCB, District Magistrate, Bharuch and the MoEF & CC, the Tribunal constituted a four Member Joint Committee comprising of the CPCB, State PCB, DISH and the District Magistrate, Bharuch. The Tribunal also noticed that in the recent past, 12 other incidents had taken place and it has been found that in most of the cases the safety norms have been breached in operating the industrial activities.

3. The observations in the said order are quoted below:-

> *"2. Above information gives rise to a substantial question of environment relating to compliance of the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 ("the 1989 Rules") and Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 (The 1996 Rules), which have been framed under the Environment (Protection) Act, 1986 (EP Act), falling in schedule to the NGT Act, 2010. It is thus necessary to determine the above question and if necessary, award relief under Section 15 of the NGT Act to the victims and for restoration of the environment after determining the liability of the persons engaged in such activity as well as role of the statutory regulators in failing to prevent the*

same. Further question is preventive measures to avoid recurrence of such incidents in future in such activities.

3. Since the report shows that the unit is engaged in manufacture of chemicals attracting Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 ("the 1989 Rules") requiring preparation of onsite and offsite plan and conducting of mock drills and as per law laid down in M.C Mehta v. UoI & Ors.[2], principle of 'Absolute Liability' is attracted in such cases to compensate the victims of such accidents as well as to compensate the environment, ***it is necessary to ascertain the cause of the incident, the extent of damage caused, the extent of compensation required to be paid for damage to the environment as well as for loss of lives, for the injuries and steps required to be taken for preventing any such occurrence in future on the same pattern as the Tribunal has dealt with such accidents in the recent past[3].***

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[2] (1987) 1 SCC 395

[3]

i. Order dated 01.06.2020, relating to incident of gas leak dated 07.05.2020 in **LG Polymers India Pvt. Limited** at Vishakhapatnam, resulting in death of 11 persons and injuries to more than 100, apart from other damage (OA No. 73/2020, In re: Gas Leak at LG Polymers Chemical Plant in RR Venkatapuram Village Visakhapatnam in Andhra Pradesh);
ii. Order dated 03.02.2021, relating to incident dated 03.06.2020 in a chemical factory, **Yashyashvi Rasayan Pvt. Ltd**. at Dahej, District Bharuch, Gujarat resulting in deaths and injuries and other damage (OA No. 85/2020) (Earlier OA 22/2020) (WZ), Aryavart Foundation through its President vs. Yashyashvi Rasayan Pvt. Ltd. & Anr.);
iii. Order dated 06.08.2020, in relation to incident of **oil well blow out on 27.05.2020 at Baghjan in the Tinsukia District of Assam** resulting in deaths, injuries and damage to the environment (OA No. 43/2020(EZ), Bonani Kakkar vs. Oil India Limited & Ors.).
iv. Orders dated 06.07.2020 and 22.12.2020, relating to incident dated 30.06.2020 on account of gas leakage at **Sainor Life Sciences** factory at Parawada in industrial area on the outskirts of Vishakhapatnam (OA No. 106/2020, News item published in the local daily "Economic Times" dated 30.06.2020 titled "Another Gas Leakage at Vizag Factory kills two, critically injures four…");
v. Orders dated 08.07.2020 and 22.12.2020, dealing with the incident dated 01.07.2020 resulting in death of 6 person and injury to 17 due to blast of boiler in **M/s Neyveli Thermal Power Station** (NLCIL), Cuddalore (OA No. 108/2020, News item published in the "Indian Express" dated 01.07.2020 titled "Tamil Nadu Neyveli boiler blast: 6 dead, 17 injured") and;
vi. Orders dated 23.07.2020 and 22.12.2020, in relation to incident of **fire engulfed the chemical plant** of **Visakha Solvents Ltd**, Vizag on 13.07.2020 at Ramky CETP Solvents building in Pharma City resulting in injuries (OA No. 134/2020, News item published on 13.07.2020 in the local daily named "India Today" titled "Massive fire engulf Vizag chemical plant, explosions heard, injuries reported").
vii. Order **dated 18.12.2020**, in relation to incident of **explosion in a plastic recycling factory at Sujapur in Malda on 1.12.2020** resulting in death of six persons, including two minors and serious injuries to four persons (OA No. 272/2020, News item published in the "Times of India" dated 20.11.2020 entitled "Six killed as blast tears through Malda Plastic recycling factory").
viii. Order dated **18.12.2020**, in relation to incident of **methane gas leak in a sugar factory** called Lokenete Bapurao Patil Agro Industries Ltd. in Mohol Taluka of Solapur District, Maharashtra on 21.11.2020 resulting in deaths and injuries and other damage (OA No. 274/2020, News item published in the "Indian Express" dated 23.11.2020 entitled "Maharashtra: Two Killed, eight injured in methane gas leak in sugar factory").
ix. Order dated 08.01.2021, in relation **to Gas Leak in Agro Company** (O.A No. 107/2020, In RE: News item published in the local daily "Indian Express Sunday Express" dated 28.06.2020 titled "Gas Leak in Agro Company Claims life of one")
x. Order dated 18.01.2021, in relation to News item published in Navbharat Times dated 24.12.2020 titled "**Gas leaks in IFFCO Plant**, 2 Officers dead" (O.A No. 04/2020, In re :

4. While directing issuance of notice to the UPL Ltd., Jhagadia, District Bharuch, Gujarat, Director, Industrial Safety and Health (DISH), Gujarat, State PCB, CPCB, District Magistrate, Bharuch and the MoEF & CC by e-mail, we constitute a four-member joint committee comprising of the CPCB, State PCB, DISH and the District Magistrate, Bharuch to give a report to this Tribunal. The nodal agency for coordination and compliance will be the CPCB and the State PCB. The committee may visit the site preferably within next one week and give its report with reference to issues mentioned in para 3 within one month by email at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF. Simultaneously, the report may also be uploaded on the website of the State PCB to enable the concerned stakeholders to access the same and file their response, if any.

5. Except for visit to the site at least once, the Committee will be free to conduct its proceedings online. It will be free to take the assistance from any other expert/organization. The Committee may suitably interact with the stakeholders and, apart from considering the present incident, also consider remedial measures for preventing such incidents in the area or by other establishments even beyond the said area. The Committee may compile information about existence and working of onsite and offsite plans in terms of 1989 Rules and conducting of mock drills and safety SOPs., number of such units in the area and the carrying capacity of the area to sustain the same. Since in the recent past, the Tribunal has dealt with similar issues of industrial accidents resulting in deaths and injuries and Expert Committees in some of such accidents have given reports to this Tribunal, such reports may also be taken into account by the Committee to the extent relevant.

Report of the fact-finding Committee and consideration

4. Accordingly, the Committee has filed its report on 17.04.2021. The report shows that the Committee visited the site, interacted with the personnel of the unit, calculated compensation and assessed the safety preparations of the unit. Based on site visit and deliberations, the Committee has given its findings on factual aspects of cause of the accident and remedial measures by the unit and the regulatory

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News item published in Navbharat Times dated 24.12.2020 titled "Gas leaks in IFFCO Plant, 2 Officers dead")

xi. Order dated 11.02.2021, in relation to accident of toxic gas leak in Rourkela Steel Plant in Orissa" (O.A. No. 09/2021, In re: News item published in The Indian Express dated 07.01.2021 titled "Four workers dead due to toxic gas leak in Rourkela Steel Plant")

xii. Order dated 16.02.2021, in relation to accident of Virudhunagar firecracker factory blast (O.A. No. 44/2021, In re: News item published in The News Indian Express dated 12.02.2021 titled "At least 19 dead in Virudhunagar firecracker factory blast, more than 30 injured")

authorities. The Committee has also made recommendations for safeguards which need to be adopted to prevent such incidents in future.

5. The salient observations, conclusions and recommendations in the report of the Committee are as follows:-

> ***"5.1 Action taken by DISH***
>
> *The officials of DISH received information over telephone at around 02:15 Hrs dated 23/02/2021 regarding the accident at unit-5 of M/s. UPL Ltd, Jhagadia. The officials of DISH reach the site around 03:00 Hrs. DISH arranged additional fire tenders & ambulances from nearby industries located in Jhagadia GIDC & Disaster Prevention and Management Centre (hereinafter referred to as 'DPMC') located at Ankleshwar and Dahej.*
>
> *SDM & DISH has immediately served head-count notice on 23/02/2021 (Copy of the same is in **Annexure - 4**). The reply submitted by the unit is in **Annexure - 5**. As per the reply, total 2 persons reported dead and 5 persons were missing.*
>
> *DISH has also issued a letter on 23/02/2021, directing the unit to close down the manufacturing activities in all plants within the premises. (copy of the same is in **Annexure - 6**)*
>
> *DISH has given breach of law remarks under schedule 19 part (2), Rule 102, para no. 5 of The Gujarat Factory Rules- 1963 dated 05/03/2021 to M/s. UPL Ltd (Unit-5). Based on the submissions by unit, DISH has filed a criminal case against the occupier in the Additional Chief Judicial Magistrate court at Jhagadia (Breach of law remarks by DISH is as **Annexure - 7** and reply by unit in this regard is attached in **Annexure - 8**).*
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> ***5.2 Action Taken by Local Police***
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> *Jhagadia police station has registered the accidental death No. 6/2021 under section 174 of Criminal Procedure Code and prepared detailed 'Panchnama' of accidental location in vernacular language Gujarati dated 23/02/2021 at accident site during 16:30 to 18:30 Hrs. As per 'Panchnama', death of three persons & missing of four persons is reported. The investigation is still under progress.*
>
> ***5.3 Action Taken by GPCB***
>
> *After the accident, a team of officials from GPCB, Ankleshwar reached the place on 23/02/2021 at around 04:15 hrs. The officials of other departments present at the site were; 1) Sub Divisional Magistrate, Jhagadia, 2) Police officials, 3) Officers of DISH, 4) Officials of GIDC, 5) Mamlatdar, Jhagadia.*

- *On reaching the site, visual inspection of the area surrounding the unit was carried out considering the smoke emitted with plume direction and firefighting activity. Considering the prevailing wind direction during the accident from N-NE to S-SW, the GPCB monitored Ambient Air Quality for Volatile Organic Compound (VOC) and Hydrocarbons by a Handy VOC meter in the downwind direction of the location of the accident, which included the village habitation (details included in* ***Annexure-9****). During the monitoring VOC emission in prevailing wind direction was measured having maximum level @ 12.6 ppm. VOC of @ 23.8 ppm was measured outside the premises at the location, North of the CM-257 plant. General hydrocarbon at two locations i.e. near the main gate of the unit and at the back side of the unit i.e. in the downward wind direction it is observed @ up to 5 ppm. Based on these monitoring results, the local authorities i.e. SDM, Jhagadia & DISH decided that evacuation from nearby villages would not be required. The GPCB also monitored Ambient Air Quality with Respirable Dust Sampler (RDS) kept on the terrace of the Police station, located near the premises of the unit during 09:00 Hrs to 17:00 Hrs. on 23/02/2021, which did not show about any alarming situation.*

- *There was generation of contaminated wastewater during the firefighting operations. The contaminated wastewater accumulated in the storm water drains (hereinafter referred to as 'SWD') within the premises of the unit and subsequently, was observed flowing in dry GIDC storm water drain. The contaminated wastewater in the GIDC SWD is observed entering into a kutcha natural drain/trench starting near M/s Lanxess India Pvt. Ltd. and the same was observed to have reached till the portion of the natural drain/trench passing near village Gumanpura. Samples of contaminated wastewater generated during firefighting were collected from various locations within & outside the premises. It was observed that contaminated wastewater did not reach Boridra nalla, where this natural drain/trench leads to. The Boridra nalla is also observed dry. The unit was directed to collect the contaminated wastewater generated during the firefighting, that was accumulated within the premises and also that had flown outside the premises. Based on the instruction, the unit has started lifting wastewater from drains inside the premises and from the natural drain/trench by making a temporary bund in the natural drain/trench passing near Gumanpura Village. The wastewater was lifted, carried through tankers and stored in the guard pond sump near the ETP within the unit's premises. The unit also carried out scraping soil from natural drain at location i.e. near Gumanpura village road Bridge and sent the dredged soil to TSDF site at BEIL Ankleshwar, manifest copy of the same is attached in* ***Annexure - 10****. The unit has submitted photographic evidence for lifting of wastewater and dredging of soil.*

- *GPCB carried out post-monitoring of the accident on 02/03/2021 to verify action taken by the unit. During this visit GPCB visited the affected areas outside the premises (along with representatives from M/s. UPL Ltd (unit-5), Jhagadia) which*

include the route of earlier flowing contaminated wastewater, GIDC SWD leading to the natural drain and Boridra nalla. During the visit the stretch of GIDC SWD and the natural drain was found dry. One soil sample is also collected from above mentioned location (area of dredging) near Gumanpura village road Bridge location for analysis purpose. The detailed post monitoring inspection report along with analysis of sample collected are attached as ***Annexure - 9****.*

- *Based on the inspection report dt: 23/02/2021, the GPCB issued Closure Direction U/s 31 (A) of Air Act on 24/02/2021 (****Annexure - 11*** *) to M/s UPL Ltd (Unit-5) with reference to the accident occurred in CM-257 plant on 23/02/2021 at early morning hours in the unit. The direction also includes interim EDC of Rs. 1 Crore to be paid by UPL LTD (unit-5), which was subsequently paid by the unit on 25/02/2021*

5.4 Cause of accident as reported by the unit

The in-house investigation report submitted by the unit is attached as Annexure-12, wherein based on the list of damaged equipment probable cause of the accident was assessed by the unit. ***It was reported that leakage of brine (Methanol Water Mixture) took place in the reactor R-25001 which might have resulted in the triggering of exothermic reaction and blast in the reactor.*** *The unit has also submitted a list of equipment, materials which were lost due to the accident.*

5.5 Interaction of committee with officials present at the time of accident in the plant/unit.

During the first visit of the joint committee on 04/03/2021, the committee interacted with Shri Vamshi Krishna, night duty officer to get his narration about the accident. He informed that at the time of the blast he was in his controlled room located near the main gate of the unit. In an immediate response, he informed senior officials of the plant about the blast and rushed to the location. According to him, the fire fighters reached the location of the accident within 2 to 3 minutes and started firefighting & rescue activities.

The committee also interacted during the visit on 09/03/2021, with Shri Tejas Borse the shift in-charge of CM-257 plant present for night duty (22/02/2021 – 23/02/2021) on the day of accident. Shri Tejas informed that the plant was on shut down since 05/02/2021 and during the night shift only basic housekeeping was carried out. All the process parameters were under control and at around 01:45 Hrs when he was at the shift in-charge cabin located in the ground floor of the plant, there was a blast however, he could escape from the plant with minor injury. As per his statement, neither knocking nor any indications nor any alert was noticed there prior to the blast.

During the interaction with the firefighting team, present on the day of accident, it was informed by the team that the firefighting team started using fire tender within 4 to 5 minutes however, one of the main fire hydrant line near CM-257 plant was damaged due to blast and hence, the portion was isolated before starting the fire hydrant system. The portion of fire hydrant line located between the plant and tank farm was also not approachable to operate, which had resulted in delayed start of fire hydrant operation.

In addition to above, additional 18 fire tenders from nearby industries & DPMC Ankleshwar and Dahej were used. Moreover, in addition to water about 317 KL of foam was also used for controlling the fire. The fire was controlled at around 6:30 hrs. however, the water hydrant system was kept operational after fire control to cool down the structure till 8:30 hrs on 23/02/2021.

5.6 Probable cause of accident as per the Joint Committee

Based on the above submission of the unit about the accident, various study carried out by the unit for plant CM-257, HAZOP, safety audit report, accident report from DISH, discussion with the representatives of the unit and field visits, the joint committee draws following observations and conclusions regarding cause of accident:

- *The manufacturing process of clethodim was developed in-house by the unit at laboratory level. Studies regarding safety and risk at various stages before converting the lab scale study into kilo-level and pilot-level were not conducted. The reaction conditions maintained in a lab-scale glass reactor cannot be so easily maintained in a plant-scale reactor. The unit has submitted lab scale trial tech-pack documents wherein for an example, the cooling medium used in the laboratory to maintain reaction temp at 5 degree C was chilled water, while the one used in the plant was methanol. An impact / safety aspect of such a change in cooling medium (chilled water to methanol) was not studied during the R&D trials in the laboratory.*

- *It was informed that the basic engineering and detailed engineering of the plant for CM-257 was carried out in-house and was erected and commissioned in October 2020. The reactor has pressure variation from atmospheric reducing to 50 Torr(Vacuum) and temperature variation of 10 to 50 deg centigrade. As per the P&ID submitted by the unit for stage-I, "the P&ID was issued for approval/Engineering on 02/03/2019". Considering the above it is understood that the P&ID and detailed engineering was carried out by the unit for manufacturing of CM-257 in 2019. Later on, it was also explained by the unit that construction of the plant for the production of Clomazone and Mesotrion and was initiated during May 2019, then subsequently by Jan 2020 there was no demand for the said products hence, the plant was converted for the production of clethodim/glufosinate/glyphosate by Change-in-product mix permission which contradicts the submission of the unit regarding the commissioning of plant.*

- *The product developed at R&D stage is further studied and reviewed at various stage like pilot stage and further scale up at design and execution stage for assuring safety during commercial production. During these stages, various data and information are being collected, which require to set design parameters and safety aspects, for engineering design and its execution. Moreover, these data are very essential to design safety instrumentation for the process and are also required for HAZOP study, HAZAN, Qualitative & Quantitative Risk assessment studies and for thermal stability study in case of exothermic reaction. Reports regarding thermal stability, reactivity and other process hazards which may be envisaged at various stages of process is not available with the unit.*

- *HAZOP study has not covered the design data and operation data of this process such as process hazards pertaining to the exothermic reaction, run away reaction, thermal stability of the product at various stages, impact of utility services leakages, reaction between the reactants and the heating/cooling fluid, imbalance of stoichiometric quantities of various reactants in the reactor, deviation from defined storage conditions for various intermediate stages, mal-function of any instruments, chemical stability of the product at various stages like intermediate and finished stage, etc. These may have resulted in oversight of various process hazards which may occur as a dangerous occurrence like explosion, fire etc.*

- *As a part of safety and process requirements, the plant was having a DCS control system with multiple temperature, pressure, and level sensors for different rectors. During discussion* ***it is gathered that there were no distress signals before the blast in the DCS system. It is strange that none of the sensors provided for the R-25001 reaction vessel gave any prior distress signals about increase in levels of temperature or pressure due to leakage of methanol and its reaction with ETB mass which might have resulted in increase in temperature as claimed by the unit.***

- *The unit submitted photographs showing complete damage of the DCS system of CM-257 plant and hence no sensor data could be recovered. Moreover,* ***it was informed that the unit does not have a central DCS centre. Thus, it appears that the systems provided on R-25001 were not adequate in terms of type of sensors, its range, its MOC, DCS data transmission facility to central DCS control etc. Central DCS system, if provided by the unit, would have given very valuable information about changes in the process parameters (temperature, pressure, leakages etc.) which might have occurred resulting in the accident.***

- *The unit informed that the plant was under planned shutdown (due to boiler shutdown) and the reason for keeping the material (about 8.50 MT of ETB) in intermediate stage in the reactor no. R25001 of CM-257 plant was not justified by the unit. The unit has submitted various work permits of the plant as evidence of*

shut down. In general, during planned shutdowns for any chemical industry, it is a general practice that the reactors with products at intermediate stages are safely emptied and stored in safe conditions, depending upon the reactivity study/ instability study etc. and defined Standard Operating Procedures are in place for such shutdown and safe startup activities. However, such a study report or defined ***standard operating procedure (SOP) for safe start-ups and safe shutdown (emergency and planned) are not prepared by the unit****.*

- *The unit has carried out a safety audit from a third party namely M/s Naik & Associcates, Surat. The safety audit report though mentions about the audit carried out for CM-257 plant in page no.08, however, the process detail, manufacturing detail about CM-257 plant is not mentioned in the "Chapter 6 Process and Hazard Information" of the report. Also, detailed about the name of vessel and its location is not mentioned in the report in the section 6.3 - Operational and process hazards with control. As per details of chemical stored in the unit, the actual total stored quantity of toluene, n-Hexane and Methanol exceeds 143 kl (storage permission from PESO to the unit). However,* ***the safety audit report does not mention any observation regarding exceedance in stored quantity beyond permission limits of PESO. Thus, the safety audit carried out by the unit shows gaps and needs to be carried out again by a competent agency, accredited by an Accreditation Board as per Rule 68 j para 9 of the Gujarat Factory Rules, 1963.***

- *The unit has informed that many of the chemicals are recovered and the same will be disposed at Common Facility for incineration. One of such recovered chemicals was ETB stored in Tank T¬25002 at ground level vertically below R-25001. It was informed that entire quantity (about 9000 kg) of ETB was recovered after the accident and emptied and stored in 9 tanks (each of capacity about 1 T). Thus, the blast in the reactor due to trigger of temperature in the reactor where ETB was kept at intermediate stage cannot be justified as ETB stored in T-25002 could survive an explosion and significantly high ambient temperatures without catching fire or explosion.*

- *The committee has also collected design details of R25001 from the unit and using the information provided, an attempt is made to calculate the internal pressure built-up/developed responsible for the blast in such a reactor.*

Calculation of internal pressure required for explosion of the reactor:

Information provided by the unit:
Reactor No. R25001 (Stage I reactor, wherein the blast took place)
Reactor diameter = 2250 mm,
MOC: SS 316L, and
Wall thickness: 12 mm,
Considering the yield strength of SS 316L = 475 MPa (normally 450-500 MPa) and

Causes of pressurization of such reactor and its failure can be due to:

(1) Circumferential stress = pD/2t,
(2) Longitudinal stress = pD/4t, and
(3) Shear stress = pD/4t or pD/8t.

Here, D=diameter of cylinder, p = internal pressure, and t=thickness of wall.

Substituting details of reactor in above equations, the minimum internal pressure found for circumferential stress is 5.07 Mpa (51.7 kg/cm^2). If such minimum internal pressure is considered to be developed in the reactor and resulted in the blast, development of such a high pressure cannot be instantaneous and without any warning signal unless, either the DCS system was bypassed or non-working or the sensors provided were not adequate in terms of range, specification, safe to give the warning signal. Moreover, it was informed that the reactor is equipped with a vent after scrubber and thus it is not convincing that at a very high internal pressure in the reactor, no fumes/liquid/gas got vented through this vent, releasing the internal pressure and preventing the explosion.

Based on above mentioned observations it can be concluded that the probable reason for the accident i.e. leakage of methanol in the intermediate stage and reaction of methanol with ETB as considered by the unit may be logical in terms of reaction chemistry. However, sudden blast in the intermediate stage of reactor, when the reactor was not in operation and that too after about 18 days, without any sign of abnormality in terms of level, temperature or pressure indicators in DCS, indicates ineffectiveness of safety system provided or assessed by the unit for the plant CM-257. Thus, serious lapses in terms of safety study, reactivity study, compatibility test, development of standard operating procedure for planned and emergency shutdown, storing intermediate stage product during shutdown, gaps in HAZOP, safety audit, inadequacy of sensors provided for the reactor might have resulted in the accident.

6. ENVIRONMENT DAMAGE ASSESSMENT

- *The joint committee conducted visits to the unit and affected areas on 04/03/2021 and 09/03/2021. During the visits the committee also inspected the portion of natural drain from where, the unit had dredged soil and collected the samples of soil as detailed below:*

Table 5: Details of samples collected by joint committee on 04/03/2021

Sampling point	
W-1	Small patch of Wastewater observed in natural drain leading to in Gumanpura village (Lat: 21.6741970, Long: 73.1139060)
W-2	Wastewater collected from outside and stored in ETP guard pond of UPL Ltd.
H-1	Soil sample collected near Gumanpura village road bridge (Lat:21.674989, Long:73.113248) at nallah
H-2	Soil sample collected near Gumanpura village road bridge (Lat:21.6741970, Long:73.1139060)
H-3	Soil sample collected near Gumanpura village (Lat:21.6790079, Long:73.1074349)
H-4	Soil sample collected near Gumanpura village road bridge (Lat:21.6723874, Long:73.1165128)
H-5	Reference soil sample near Gumanpura village bridge (21.672544, 73.116402)

Analysis reports of the above mentioned samples collected by the committee are attached as ***Annexure- 9****.*

- *It was informed to the committee that the wastewater during firefighting reached a point up to location H3 (as shown in google image above) falling under revenue land of Gumanpura village area and had not reached to Boridra Nalla. The entire stretch of the natural trench/drain including Boridra nalla was dry before the accident.*
- *During the visit on 04/03/2021, it was observed that the unit had dredged the top layer of the soil in the natural trench/drain passing near Gumanpura village and as reported, 19 MT of contaminated soil was disposed to CHWTSDF, a scientific landfill site. It was also informed that the wastewater was lifted from the bridge on the natural drain near Gumanpura Village by constructing a temporary bund.*
- *The wastewater was transferred to a guard pond inside the premises of the unit. A sample of waste water from the guard pond was also collected during the visit. It was informed that about 3000 kl of wastewater from inside and outside was collected back.*

The soil samples collected from the dredged drain/trench were analysed for various parameters. From the analysis reports of the soil samples, It is found that the TOC in the soil sample varies from 0.0357 to 0.168 gm/kg. The soil sample (H5) was collected as reference from the ramp used by the unit for movement of tankers near Gumanpura village bridge as the same was not yet dredged and disposed off by the unit. Higher concentrations of almost all measured parameters were found in the

sample collected from Location H5 as compared to other soil samples. The unit needs to collect and dispose of the soil from this location to CHWTSDF site.

The analysis result of the sample is provided in Annexure – 9.

The accident was assessed in terms of the damage caused to the environment. Based on the information submitted by the unit about the accident, meteorological data, list of chemicals with quantity lost during accident, analysis of samples and considering the steps taken thereafter, by the unit, the components considered by the committee for calculating damage to the environment are mentioned in the subsequent paragraphs.

The damage caused to the environment is evaluated based on air, water and soil components considering the probable impact, steps taken by the unit to restore the same.

6.1 Meteorological data on 23/02/2021

Actual meteorological data obtained from M/s. DCM Shriram Alkalies Ltd., Jahagdia situated adjacent to the accident site during the period of accident on 23/02/2021, indicates average wind speed is @2.77 km/h, predominant wind direction is from N-NE to S-SW, Avg. Temperature 23 ^{0}C., humidity 52.72 % etc.

Although the prevailing predominant wind direction during the two days period i.e. from the 2223/02/2021, was from West to East, the actual predominant wind direction observed as per the tabular meteorological data for the period during which the fire accident continued i.e. 1:46 hrs to 6:30 Hrs on 23/02/2021 as from N-NE to S-SW direction. Meteorological data on 23/02/2021 is attached in ***Annexure - 14.***

6.2 Air Component

The unit has submitted a list of chemicals with quantity lost due to accident on 23/02/2021 early morning hours. The committee has referred to the methodology adopted for calculation of total quantum of chemicals converted using stoichiometry to various components of all the chemicals which were reportedly lost except for Toluene at various stages and ethanol water mixture. Portion of Toluene is considered burnt and remaining emitted as VOCs from the surface of the flowing water. Accordingly, evaluating damage for air components, two factors were considered i.e. complete combustion of chemicals and emission of VOCs due to toluene.

6.2.1 Estimation of amount of Toluene vaporized

The volatile organic compound such as toluene having low water solubility will be volatilized in air. After the accident, severe smell of toluene was felt by the people at and around the site. The volatility of a volatile organic liquid from a surface depends on vapour pressure of

compound, wind speed, and the ambient temperature. Since the specific gravity of toluene is less than water, the undissolved toluene will float on the surface of water.

The volatility of a volatile organic liquid from a surface may be estimated by the following method.

Organic compound volatilized (kg/h/m^2) = 0.00116xMWxPxW$_{0.625}$ Equation. 1

(Source: Evaporation Rate of volatile liquids, USEPA, 1989)

Where, W = wind speed in ft/min, P = vapor pressure of compound in inch Hg, MW = molecular weight of compound in gram.

Considering a wind speed of 0.5 km/h (27.9 ft/min) near ground surface corresponding to the wind speed of 2.5 km/h at 10 m at the time of accident, vapor pressure of toluene as 28 mm Hg (1.12 inch Hg) at 25 deg C, and molecular weight of toluene = 92 g/mole, equation (1) predicts the rate of toluene volatilization as 0.95 kg/h/m^2, respectively.

Estimation of the total surface area from where volatilization occurred can be obtained by calculating the surface area of drains as under:

1. *Total length of GIDC drains carrying fire-fighting water around unit = 700 m, average width 1.0 m, hence surface area = 700 m2*
2. *Total length of katchcha drains wherein fire-fighting water flowed = 3900 m of average width 1 m, hence surface area = 3900 m^2.*

Thus, total surface area from where toluene can volatilize = 4600 m^2.

Considering toluene volatilization rate of 0.95 kg toluene/h/m^2,

The total mass of toluene volatilized would be 4370 kg/h.

The total time for volatilization is difficult to predict since all the drain surface area does not become occupied at once. The committee has considered 2 hours for estimation of calculating quantum of toluene, which gives amount of toluene volatilized = 8740 kg. Such vapours of hydrocarbon can produce radicals and secondary pollutants in the sunlight which could be potentially hazardous. Thus for combustion calculation remaining quantum of toluene 18260 kg is considered.

- *Combustion of chemicals may have led to generation and release of various gaseous pollutants such as sulfur dioxide (SO2), hydrogen chloride (HCl), oxides of nitrogen (NOx), carbon di-oxide (CO2) etc from the chemicals lost during the blast and subsequent fire in the unit. The moles of chemical compounds were considered to calculate the mass of gaseous emissions as shown in Table below.*

Table 6:Calculation of Gaseous emissions due to combustion of chemicals during the accident

Chemical formula	Quantity Lost	Quantity Considered for calculation, kg	kilo moles	C	N	O	S	Cl	CO2, kg	SO2, kg	NO2, kg	HCl, kg
C6H12OS	8500	8500	64.39	6	0	1	1	0	17000	4121	74	0
C6H15N	112	112	1.60	4	1	1	0	0	282	0	0	0
C2H5SH	1000	1000	16.13	2	0	0	1	0	1419	1032	605	0
C6H13N	1302	1302	13.15	6	1	0	0	0	3472	0	0	0
C7H8	27000	18260	198.48	7	0	0	0	0	61131.9	0	0	0
C16H24O5S	3666	3666	11.18	16	0	5	1	0	7868	715	0	0
C16H24O5S	712	712	2.17	16	0	5	1	0	1528	139	4472	0
C3H6ONCl.H	14000	14000	97.22	3	1	1	1	2	12833	6222	4472	7097
C3H6ONCl.H	14000	14000	97.22	3	1	1	1	2	12833	6222	0	7097
C2H5OH	1500	750	12.10	2	0	1	0	0	1065	0	0	0
Total gaseous emissions in kg									**119431.**	**18452**	**9623**	**14194**

6.2.2 Estimation of Environmental Damage compensation due to release of gaseous emissions

To estimate the damage compensation due to air pollution, the methodology employed by the Committee constituted in case of Yashashvi Rasayan Pvt. Ltd., Dahej (OA NO. 22 of 2020), was adopted. The damage values per ton of SO2, NOX, HCl, and CO2 were taken as (Rs. in Lakh) 2.1989, 2.1729, 0.2189, and 0.0225 per MT of gas, respectively. No such damage value for the release of toluene is available to the best of Committee's knowledge. Therefore, ***considering the risk of production of secondary pollutants in air due to toluene vapour, a damage value of Rs. 2.1989 lakh per MT of toluene vapor (maximum value among SO2, NOX, HCl, and CO2) is taken as damage value of toluene. Based on these Damage values, the total damage cost due to air pollution caused by fire and explosion is estimated as shown in below table.***

Table 7: Estimation of Damage value due to Air pollution caused by fire

Air pollutant, MT	SO2	NOx	HCl	CO2	Toluene vapor
	18.452	9.623	14.194	119.432	8.74

Damage value, Rs. In	2.1989	2.1729	0.2189	0.0225	2.1989
Damage value, Rs. In Lakh	40.57	20.91	3.11	2.69	19.22
Total Damage value, Rs. in Lakh : 86.51					

Thus total amount of Rs. 86.51 lacs is calculated for environmental damages for air component.

6.3 Water and Soil Component

The explosion at UPL caused damage to all the compartments of environment emission/discharge of pollutants. Explosion followed by fire led to combustion of other chemicals and intermediates stored in the plant. The water used for fire-fighting contained foam used for fire fighting and the unburnt chemicals which flowed through GIDC drain from the premises to a point near M/s Lanxess followed by the katchcha drain/trench (after M/s Lanxess) and eventually accumulated on open land as the wastewater reportedly did not reach any natural water bodies (Boridra Nallah).

The committee calculated the firefighting water required and subsequent steps taken by the unit to calculate the damage to the environment for the water component.

6.3.1 Damage to Water Environment

Estimation of the amount of water used for fire-fighting

The unit informed that during fire fighting 18 numbers of 1" diameter and 3 numbers 3" diameter nozzle fire hydrants respectively with water pressure in the hydrant maintained at 6-7 kg/cm^2 were used. Considering co-efficient of discharge "Cd" of fire hydrant nozzles varies between 0.7-0.9 depending on the type of nozzle.

The discharge per nozzle can be given as,

$$Q=Cd\times(\pi/4)x\ D^2\times\sqrt{(2gH)}$$

Where, Q = flow in m^3/sec, D = diameter of nozzle in m, H = water head in m.

Taking value of Cd = 0.8, and water head of 60 m, the flow of water by one 1" (25 mm) and one 3" (75 mm) water hydrant nozzles will be 0.0134 m^3/s (48.24 m^3/h) and 0.121 m^3/s (435.6 m^3/h), respectively. Thus, calculatedly the total water discharged from all the fire hydrants (18 nos. of 1" and 3 nos. of 3" diameter) will be approximately 2175 m^3/h

Considering 6 hours of operation of fire hydrants total amount of water used for fire fighting will be: ~13000 KL (As per the information provided by the unit, the fire hydrants were operated for 6 hours)

GIDC drainage network are blocked for all seasons except monsoon and to monitor the same CCTV camera focused at the drain near M/s Lanxess India Pvt. Ltd. was provided. GIDC has concrete drainage network from the unit till the exit point of the GIDC drain after crossing M/s Lanxess India Pvt. Ltd. The GIDC drain is subsequently meeting an open kachcha drain/trench leading to Gumanpura village area. The committee has obtained CCTV Footage from the M/s Lanxess India Pvt. Ltd.and the time duration when the dry drainage network of GIDC Jhagadia near M/s Lanxess India Pvt. Ltd. has recorded flow, was considered by the committee.

- *It may be seen that the flow started in the GIDC storm water drain at 6 AM (~4 hours after the accident) and continued until 3 PM. The GPCB officers at the time of visit observed that the average flow velocity in the drain was 0.75 – 1.5 m/s and depth of flow 0.2 – 0.4 m. Taking the average width of cross section of water flow as 1 m, and considering average values of water depth and flow velocity, the total quantity of water flowing in the storm water drain would be approx. 10000 KL. As per report prepared by GPCB on 23/02/2021, wherein it is mentioned that the contaminated wastewater from the unit was found flowing downstream to a location in the Gumanpura village but did not reached to Natural Drain Boridra nalla.*

- *Based on instructions of GPCB, the unit later on, blocked the drain and started lifting fire-fighting water from the drain near Gumarnpura village on 23/02/2021. The unit reported that about 3000 KL water was lifted from UPL drains and GIDC drain and stored in the Guard pond within the unit. The water lifting work was reportedly completed on 24/02/2021. Thereafter the unit has started dredging of soil and lifting of soil from the area. The work of soil dredging and lifting was reportedly completed on 25/02/2021. Considering the lifting of 3000 KL runoff water by the unit about 10000 KL of fire-fighting runoff water out of total estimated quantity of 13000 KL, went to the natural drain/trench, further going all the way to Gumanpura village, about 5.7 km away from the unit (as per the Google earth image).*

The unit provided a list of chemicals lost during the accident as shown in Table 1. These chemicals are highly flammable and it was assumed that most of these chemicals would have been burnt during the fire. However, runoff of firefighting water sample collected by GPCB on 23/02/2021 and the sample of wastewater from guard pond collected by the joint committee on 04.03.2021 reveals that the wastewater has concentration of organics in terms of COD (1272-1932 mg/L) in addition to various other monitored parameters.

When fire-fighting water containing such chemicals is released in to natural environment, there are following possible fates of such chemicals

1) *The chemical dissolved in fire-fighting water can percolate in the soil causing land pollution and may contaminate groundwater*
2) *A part of volatile chemicals (such as toluene which is less soluble) volatilized in air and cause air pollution, and*

Considering lifting of firefighting water from natural trench and subsequently dredging of wet soil from the drain/trench and disposal of contaminated soil to CHWTSDF site (about 19 MT wet soil) by the unit, monitoring results of soil samples collected from the drain/trench on 04/03/2021, the committee is in view that the unit has taken possible steps however environmental damage due to spillage of contaminated runoff water cannot be ruled out.

The damage caused and the level of impact due to organic pollutant released is evaluated in monetary terms by the committee by considering two factors

- *the waste of natural resources i.e. fresh water used for fighting and cost of treatment of the wastewater generated as per the prevailing treatment cost as charged by the common effluent treatment plants (CETPs) and*
- *Liability towards the environmental damage due to spillage of contaminated runoff water.*

The total compensation towards environmental damage due to the discharge of fire-fighting water contaminated with hazardous chemicals (approx. quantity 10000 kL, COD 1272-1932 mg/L) is calculated in below table.

Table 8:Calculation of Environmental Damage

Valuation of environmental damages due to release of organic load in the wastewater	=	Rate of freshwater in the Jhagadia GIDC	+	Treatment cost of the contaminated wastewater generated from fire fighting	+	Liability and Remediation Cost in case of a Fire accident leading to spillage of hazardous waste/ contaminated runoff water*
		Rs. 40 per kl x 13000 kl = Rs.5.2 lac (Rs. 40 per kl GIDC water supply charge)	+	Rs.80 per kl x 10,000 kl = Rs.8 lac (Rs. 80 per kl CETP treatment charge for COD concentration of 2000 mg/l)	+	Rs. 120 lakh

**According to the CPCB "Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Waste and Penalty".*

- *Thus, Total amount of Rs. 133.2 lacs calculated for environmental damages of water and soil component.*

The total cost of Environmental damage compensation due the accident at UPL sums up to Rs. 133.20 lakh (due to the discharge of contaminated fire-fighting water and soil) + Rs. 86.51 lakh (due to the air pollutant) = Rs. 219.71 lakh.

7. COMPENSATION TO DECEASED PERSONNEL

The compensation amount for the personnel who lost their lives due to the unfortunate fire accident on the intervening night of 22nd February and 23rd February 2021, three court cases i.e. "Sarla Verma & Ors. Vs. Delhi Transport Corporation & Anr.", "Sunita Tokas Vs. New India Insurance Co. Ltd." and "Amrit Bhanu Shali & Ors. Vs. National Insurance Co. Ltd. & Ors." to base the calculation for the payment of compensation considering the following components-

1. *Monthly salary of the deceased i.e. gross salary of deceased personnel as per the list provided by the unit.*
2. *Addition to income for future prospect: The committee has considered following criteria referring to the judgement order of Sarla Verma &Ors Vs. Delhi Transport Corporation &Anr., para 11, "In view of imponderables and uncertainties, we are in favour of adopting as a rule of thumb, an addition of 50% of actual salary to the actual salary income of the deceased towards future prospects, where the deceased had a permanent job and was below 40 years. [Where the annual income is in the taxable range, the words 'actual salary' should be read as 'actual salary less tax']. The addition should be only 30% if the age of the deceased was 40 to 50 years. There should be no addition, where the age of deceased is more than 50 years".*
3. *Deduction for personal and living expense: The committee has considered following criteria referring the judgement order of Sarla Verma &Ors Vs. Delhi Transport Corporation &Anr., Para 14, "Having considered several subsequent decisions of this court, we are of the view that where the deceased was married, the deduction towards personal and living expenses of the deceased, should be one-third (1/3rd) where the number of dependent family members is 2 to 3, one-fourth (1/4 th) where the number of dependant family members is 4 to 6, and one-fifth (1/5 th) where the number of dependant family members exceed six" and "Where the deceased was a bachelor and the claimants are the parents, the deduction follows a different principle. In regard to bachelors, normally, 50% is deducted as personal and living expenses, because it is assumed that a bachelor would tend to spend more on himself",*
4. *Multiplier: The committee has considered following criteria referring the judgement order of Sarla Verma &Ors Vs. Delhi Transport Corporation &Anr., para 21, " We therefore hold that the multiplier to be used should be as mentioned in column (4) of the Table above (prepared by applying Susamma Thomas, Trilok Chandra and Charlie), which starts with an operative multiplier of 18 (for the age groups of 15 to 20 and 21 to 25 years), reduced by one unit for every five years, that is M-17 for 26 to 30 years, M-16 for 31 to 35 years, M-15 for 36 to 40 years, M-14 for 41 to 45 years, and M-13 for 46 to 50 years, then reduced by two units for every five years, that is, M-11 for 51 to 55 years, M-9 for 56 to 60 years, M-7 for 61 to 65 years and M-5 for 66 to 70 years"*

5. *Expense towards love & affection*

The committee has referred three cases i.e. "Sarla Verma & Ors. Vs Delhi Transport Corporation & Anr", "Sunita Tokas Vs. New India Insurance Co. Ltd" and "Amrit Bhanu Shali & Ors Vs. National Insurance Co. Ltd. &Ors."

In which the court has taken different view on different cases depending upon the subjective merit of the case for expense towards love & affection.

Table 9: The amount of expense towards love and affection in the above-mentioned cases

Case	Expense towards love & affection
Sarla Verma & Ors. Vs Delhi Transport Corporation & Anr	Rs. 10,000/- (as loss of consortium)
Sunita Tokas Vs. New India Insurance Co. Ltd	Rs. 2,00,000/-
Amrit Bhanu Shali & Ors Vs. National Insurance Co. Ltd. &Ors	Rs. 1,00,000/- (Rs. 50,000/- to each dependent)

The committee is of the opinion to consider the expenses towards love and affection is 200000/-per case*.*

6. *Expense towards last rites- The committee has referred following three cases as tabulated below and considered Rs. 50,000/- as amount of expense towards last rites.*

Case	Expense towards last rites
Sarla Verma & Ors. Vs Delhi Transport Corporation & Anr	Rs. 5,000/-
Sunita Tokas Vs. New India Insurance Co. Ltd	Rs. 50,000/- (Loss of estate & funeral expense)
Amrit Bhanu Shali & Ors Vs. National Insurance Co. Ltd. &Ors	Rs. 10,000/-

Considering the above methodology the committee calculated the amount for deceased personnel and provided as ***Annexure – 15.*** *The unit has submitted details about the compensation paid to the diseased personnel to the SDM Office.*

Table 10:A comparative table of total compensation assessed by the committee and amount already paid by the unit is shown in table below:

S. N.	Name	Compensation estimated by the committee	TOTAL COMPENSATION ALREADY PAID BY THE UNIT				
			EX-Gratia	GPA	Term Insurance	Workmen Compensation	Total Amount
1	**Late Ketankumar Gevariya**	**61,48,342.90**	**3549000**	**1500000**	**1000000**	**0**	**60,49,000.00**
2	**Late Vanrajsinh Dodiya**	**47,31,523.00**	**3000000**	**1500000**	**1000000**	**0**	**55,00,000.00**
3	**Late Krunal Patel**	**36,34,360.00**	**3000000**	**900000**	**1000000**	**0**	**49,00,000.00**
4	**Lt Nehal Mehta**	**38,32,630.00**	**3000000**	**1300000**	**1000000**	**0**	**53,00,000.00**
5	**Late Kuvarlal Kasdekar**	**16,16,794.00**	**1500000**	**0**	**0**	**954101**	**24,54,101.00**
6	**Late Kamal Panse**	**16,16,794.00**	**1500000**	**0**	**0**	**932986**	**24,32,986.00**
7	**Late Maniram Dhikare**	**16,16,794.00**	**1500000**	**0**	**0**	**938634**	**24,38,634.00**

The unit paid total Rs. 2,90,74,721.00/- and has informed that in addition to the above Gratuity, EDLI and PF are also paid as per rules. Therefore, the committee is of the opinion that ***the unit has already paid compensation under various heads which is more than the compensation calculated by the committee referring the methodology as per orders of various matters of Hon'ble Supreme court of India and Hon'ble NGT except for Late Ketan Kumar Garviya. Therefore, the difference of the amount of Rs. 99342.00/- may be considered by Hon'ble Tribunal as additional compensation to be paid by the unit to the dependent of Late Ketan Kumar Gurviya***

Detailed Information regarding compensation paid by unit to Injured persons are enclosed in ***Annexure- 15****.*

8. CARRYING CAPACITY OF JHAGADIA GIDC

The committee has collected information about existence of various infrastructure facilities in GIDC Jhagadia with respect to number and types of industries, environment management facility, status of onsite and offsite plans in terms of 1989 Rules and mock drills, fire fighting facility, health care facility in the GIDC, details about the list of hazardous chemical storage permission to MAH units in the estate etc. to assess the present capacity in terms of safety of the area.

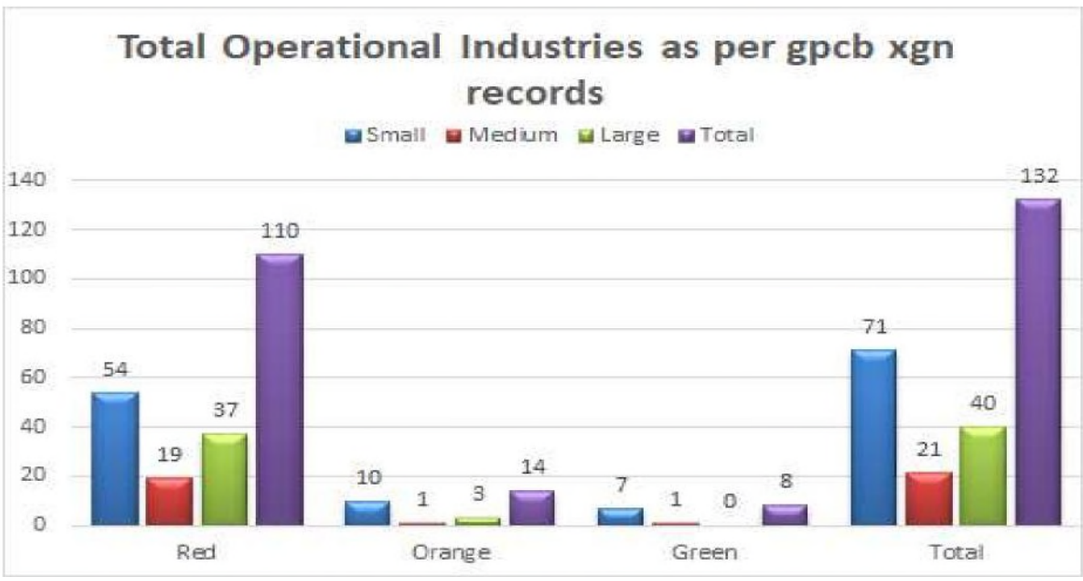
8.1 About Jhagadia Industrial Estate

Jhagadia Industrial Estate is situated in the golden corridor of south Gujarat is developed by Gujarat Industrial Development Corporation (GIDC) in 1993 at Jhagadia, Taluka Jhagadia, Dist. Bharuch. It is one of the largest agglomerations of industrial units and classified as Mega Industrial Estate is spread over an area of 1700 hectares of land divided into 285 plots. As per records of GIDC, out of total spread area about 1300 hectares are allotted. There are a total 285 plots in GIDC, out of which 275 plots are allotted and 10 plots are not allotted. Out of 275 allotted plots, status of 36 plots is under construction, 100 are open plots. The estate is located @ 16 km in north-east direction from Ankleshwar Industrial Area.

As per GPCB record, statistics of operational industries-category and scale wise and operational units are given below Table &graphs

Table 11: Statistics of total operational industries-category and scale wise

Scale → Category	**Small**	**Medium**	**Large**	**Total**
Red	54	19	37	110
Orange	10	1	3	14
Green	7	1	0	8
Total	**71**	**21**	**40**	**132**



Graphs showing Operational industrial statistics in Jhagadia Industrial Estate (Source: GPCB xgn).

8.2 Details of Present Infrastructure:

8.2.1 Environmental Infrastructure

Wastewater management

Individual industries located at Jhagadia Industrial estates discharges treated wastewater into GIDC drainage network form where it is collected in collection sump at Jhagadia from where it is transferred to Booster Pumping Station at Kantiajal. Booster Pumping Station at Kantiajal also receives wastewater from Final Effluent Treatment Plant (FETP) at Ankleshwar which receives industrial effluent from Ankleshwar and Panoli Industrial estates. Further, mixed effluent (Jhagadia, Anklehwar & Panoli) from collection Sump at Kantiajal, discharge to deep sea through marine outfall.

Air quality monitoring system (NAMP station, CAAQMS)

- *One NAMP station is operated by GPCB for collection of ambient air sampling as per the CPCB guidelines. The station is located at the terrace of Jhagadia Industrial Association (JIA) office in GIDC Jhagadia.*
- *CAAQMS facility is presently not available.*

8.3 Carrying Capacity

Carrying capacity in terms of safety provisions is assessed by the committee by collecting information about the availability and working of onsite and offsite emergency plan, mock drill, safety SOPs, availability of firefighting facility, health care facility in the GIDC, status of Major Accident Hazard (MAH) units in the GIDC Jhagadia etc.

Considering the definition of Major Accident and Major accidents Hazards installation, 11installation in the GIDC Jhagadia are classified as MAH Installation. Definition of Major accident and Major Accident Hazardous Installation is given below.

"Major Accident" means an accident involving loss of life inside or outside the site or ten or more injuries inside and/or one or more injuries outside or release of toxic chemical or explosion or fire of spillage of hazardous chemical resulting in 'on-site' or 'off-site' emergencies or damage to equipments leading to stoppage of process or adverse effects to the environment.

Definition of Major Accident Hazard (MAH) installation

"Major Accident Hazard (MAH) installation" means isolated storage and industrial activity at a site handling (including transport through carrier or pipeline) of hazardous chemicals equal to, or in excess of the

treshold quantities specified in COLUMN 3 OF SCHEDULE 2 and SCHEDULE 3 respectively.

List of MAH Installation in the GIDC Jhagadia is given in table below:

Table 12 : List of MAH Installation in the GIDC Jhagadia

SN	FACTORY NAME	ADDRESS
1	Air Liquid India Holding Pvt Ltd.	Plotno.38/1,GIDC, Jhgadia Dist-Bharuch.
2	Cheme Organic Chemicals.	Plot No. 758,GIDC Estate, Jhagadia,Bharuch.
3	Galaxy Surfactants Ltd.	892,GIDC Jhagadia, Dist-Bharuch.
4	J M Hubar India Pvt Ltd	754 Jhagadia Indl. Estate,GIDC Bharuch 393 110.
5	Klg Organic Ltd.	Plot No.759, GIDC, Jhagadia, Dist. Bharuch.
6	Lanxess India Pvt Ltd	748/2/A,748/3,748/4/A & B GIDC Jhagadia, Dist-Bharuch
7	Panoli Intermediate (India) Pvt. Ltd.	Plot No. 778/1, GIDC, Jhagadia,Bharuch-393 110
8	Saint Gobain Glass India Ltd	36, GIDC Jhagadia , Dist-Bharuch
9	Shriram Alkali & Chemicals (A unit of Dcm Shriram Consolidated) Ltd.	749 GIDC Indl. Estate, Jhagadia, Bharuch-393 110
10	Upl Ltd (Unit-5).	750 GIDC Indl. Estate, Jhagadia, Bharuch-393 110
11	Vardhman Acrylics Ltd.	755 GIDC Mega Estate, Jhaghadia, Dist. Bharuch

Detailed information about the list of hazardous chemicals with maximum storage quantity and availability of fire tenders with MAH unit wise is provided in ***Annexure – 16****.*

Working of Offsite, Onsite emergency plan and Mock drill

As informed by DISH,

- *District offsite plan is prepared for Bharuch District wherein GIDC Jhagadia is part of the plan. Offsite mock drill is one of the mandatory requirements to ascertain the working of the offsite plan as per MSIHC Rule under the chairmanship of Dist. Collector. Offsite mock drill was carried out at Jhagadia GIDC on 10/07/2020 at M/s DCM Jhagadia. The Mock drill was planned and carried out for fire in a hydrogen bank truck. Major aim of mock drills is to record the response time and steps to be taken to minimise the same.*

- *As per the District Off-Site plan, Jhagadia GIDC has Local Crisis Group comprising 14 members (representative from MAH units and other units).*
- *DISH informed that all MAH units have onsite emergency plans and a third party safety audit is also carried out and submitted to DISH by all MAH units in the GIDC. As per the statutory requirement, MAH units has to carry out in house mock drills twice in a year and mock drill reports are to be submitted to DISH. All MAH units regularly submitted mock drill reports to DISH.*

8.4 Present Capacity of GIDC in terms of safety infrastructure

Jhagadia GIDC Estate is growing with lots of new vulnerability of Risk, having more than one hundred thirty active industries spread in almost 1720 hectares of the land. The GIDC is surrounded by villages having almost 50,000 populations in the vicinity of about 10 kms radius. There are total 11 MAH units in the Jhagadia GIDC.

It can be seen that 09 MAH units located in close vicinity and accident in one unit likely to have adverse impact on surroundings and neighbouring units. The MAH units are mutually support each other during any accident in the area. There are only Five MAH units having Fire Tender vehicles with trained fire crew. At present, the available firefighting and allied facilities of the GIDC estate is not adequate even the local fire station of Jhagadia GIDC is also not well equipped and has only one fire tender. The scenario of accident of UPL indicates that the present infrastructure is not enough to handle such types of accident involving fire and explosion. As during the firefighting operation of almost 18 fire tenders from nearby industries of Jhagadia GIDC, from DPMC, Ankleshwar, DPMC-Dahej, GNFC-Bharuch were mobilised in addition to the in-house firefighting capability of the unit.

During the accident at UPL, the injured personnel were given first aid at the health centre of the unit and ambulances were mobilised for taking injured personnel to hospitals Smt. Jayaben Modi Hospital, Ankleshwar, as the area do not have any such facility. The available facilities are in Bharuch and Ankleshwar areas which are almost 25-30 kms away from Jhagadia GIDC estate.

Looking at the above facts, the committee is in the opinion that a review of fire load of individual industries and firefighting facility provided may need to be carried out by concerned authority considering IS13039:2014 and such standards provisions and also to establish a Disaster Prevention and Mitigation Centre (DPMC) type of infrastructure with well-equipped control room with all necessary fire & safety equipment and having trained firefighting staff, rescue workers and first-aiders personnel, deployed round the clock in Jhagadia GIDC, equipped with at least Four Water-cum-foam fire tenders and two HAZMAT vehicles to combat Chlorine and other toxic gas release. In addition to the above, a common water reservoir of adequate capacity with an advanced

pumping system in the area may also be planned. Health care facility is also required to be planned as presently the area is not having any such facility to provide even the primary treatment in case of such accident.

9. CONCLUSION

Hon'ble National Green Tribunal (NGT), Principal bench, New Delhi took up the matter on suo-moto basis in the application no. 60/2021 on 25/02/2021, and constituted a joint committee vide orders dated 25/02/2021 to submit a report on the accident that took place in M/s UPL Ltd. (Unit 5), GIDC Jhagadia on 23.02.2021. The accident took place in the manufacturing plant of the final product namely, Clethodim which is herbicide, in CM-257 plant at M/s UPL Ltd. (Unit 5), GIDC Jhagadia. The blast followed by massive fire in the premises of the unit took place on 23/02/2021 in the reactor (stage I, CM-257 Plant). During the accident, the plant process was under shutdown since 04/02/2021 owing to boiler maintenance and inspection. However, materials at intermediate reaction stages were stored in the different reactors of the plant. The reactor in which the blast took place was having about 8.0 MT of Ethyl Thio Butanol (ETB) which is the first stage intermediate product in the process of manufacturing Clethodim. ***The blast was so massive that it felt like anearthquake in the entire area resulting into death of 07 personnel working in the plant, injury to 53 personnel within the premises, damage of other reactors/tank form containing various chemicals, other infrastructure including the DCS building, sheds of other plants, glass of windows inside the premises of the unit etc****.*

The joint committee visited the unit on 04/03/2021 and again on 09/03/2021. During visit, the committee interacted with some of the concerned officials present on duty on the day of accident in the unit, representatives of the unit, collected various available reports and records from the unit. Referring to the reports prepared by DISH, GPCB and other authorities, action taken by different authorities, information collected & observations in connection with accident following conclusions were drawn by the committee:

- *The plant CM-257 was commissioned by the unit based on its in-house R&D Study, basic and detailed engineering. During such in-house development of products, more focus need to be given in conducting proper safety and stability test at various stages. However, in the plant stage serious lapses in HAZOP study, safety audit, non-availability of SOP for safe shutdown etc. were observed. The unit has not yet been able to identify the root cause of the accident. One of the probable reasons reported by the unit is leakage of methanol in the reactor containing ETB which might have triggered due to exothermic reaction and resulted in the blast. The reaction of methanol with ETB may be logical in terms of reaction chemistry. However, serious lapses in terms of safety study, reactivity study, compatibility test, development of*

standard operating procedure for planned and emergency shutdown, storing intermediate stage product during shutdown, gaps in HAZOP, safety audit, in adequacy of sensors provided for the reactor etc. might have resulted in the accident.

- *Considering the accident as reported in the social media, during manufacturing of similar product in China in 2019 and in the present case, the committee is in of the opinion that* ***detailed various studies w.r.t. the safety aspects as mentioned in the para above, needs to be carried out before reconsidering manufacturing of Clethodim, as there is a lack of information about thermal stability, reactivity at intermediate stages, and safety provisions as observed in the present case.***

- *The unit has submitted safety audit report, as per which, details of chemical stored in the unit, the actual total stored quantity of toluene, n-Hexane and Methanol exceeds 143 kl (storage permission from PESO to the unit). However, the safety audit report does not mention any observation regarding exceedance in stored quantity beyond permission limits of PESO. Moreover, the audit report has various gaps which includes lack of detailed process hazards from CM-257 Plant.* ***Thus, the safety audit carried out by the unit shows gaps and needs to be carried out again by a competent agency, accredited by an Accreditation Board as per Rule 68 j para 9 of the Gujarat Factory Rules, 1963 and restrict the storage of chemicals as per permission from PESO****.*

- *The committee is also of the opinion that the* ***unit needs to review entire safety aspects in terms of SOP, HAZOP study, Qualitative and Quantitative Risk assessment, fire load, etc. as gaps were identified during visits. The unit needs to take required measures to fulfil the gaps identified in the report.***

- *The committee has calculated Environmental Damage cost considering the air, water and soil component. The chemical lost during the accident were converted in terms of pollutants like sulphur-di-oxide, carbon-di-oxide, HCl etc. except a part of toluene considered to be emitted as VOC along with firefighting water. The quantity of firefighting water used is estimated and based on the concentration of COD, the water component is calculated in lieu of loss of natural resources and treatment cost. In addition, t****he liability towards damage in the area is also considered due to spread of contaminated water on soil. Considering above, the total cost of Environmental damage compensation due the accident sums up to Rs. 219.71 lakh which may be considered by Hon'ble Tribunal to be paid by the unit towards Environmental Damage compensation.***

- *The committee calculated compensation for the deceased personnel refereeing various orders of Hon'ble Supreme Court of India and various reports of Hon'ble NGT.* ***The committee is of the opinion that the unit has already paid about 290.74***

lakh towards compensation under various heads which is more than the compensation calculated by the committee except for in case of Late Shri Ketan Kumar Garviya. Therefore, the difference of the amount of Rs. 99,342.00/- may be considered by Hon'ble Tribunal as additional compensation to be paid by the unit to the dependent of Late Shri Ketan Kumar Gurviya*.*

- *The committee has also identified inadequacies in present infrastructure to combat the major accident scenario in the Jhagadia GIDC. Though it was informed that onsite emergency plan and mock drill is carried out by all 11 Major Accdient Hazardous (MAH) units in the estate as statutory requirement and local crises group is also there in the GIDC as per offsite plan of Bharuch District,* ***the committee is of the opinion that a safety review in terms of fire load of individual industries and firefighting facility provided by them needs to be carried out by concerned authority in compliance to the IS 13039:2014 and other similar standard provisions****.*

- *There is an urgent need of infrastructure like Disaster Prevention and Mitigation Centre (DPMC) with well-equipped control room, all necessary fire & safety equipment, trained firefighting staff, rescue workers and first-aiders personnel deployed round the clock in Jhagadia GIDC. The proposed DPMC should be equipped with at least Four Water-cum-foam fire tenders and two HAZMAT vehicles to combat Chlorine and other toxic gas release may be provided in the GIDC. In addition to the above, a common water reservoir of adequate capacity with an advanced pumping system in the area may also be planned.* ***Health care facility is also required to be planned in vicinity of the Jhagadia estate, as presently the area is not having any such facility to provide even the primary health treatment."***

Discussion and directions

6. We have heard learned Counsel for the CPCB, the Project Proponent and the representative of Gujarat State PCB. No one has entered appearance on behalf of the State. Questions for consideration are the cause of the incident and remedial measures, including compensation to the victims and restoration of environment.

Cause of the incident and remedial measures

7. We find that several accidents have recently taken place in the course of industrial activities on account of gas leak, blast, fire etc.. The details of some of such cases have been already mentioned in the earlier

order quoted above including an incident in same District - District Bharuch in a chemical factory Yashyashvi Rasayan Pvt. Ltd. In respect of the earlier incident dated 03.06.2020 in Yashyashvi Rasayan Pvt. Ltd, the Tribunal has dealt with the matter vide order dated 03.02.2021 in *O.A. No. 85 of 2020, Aryavart Foundation through its President v. Yashyashvi Rasayan Pvt. Ltd. & Anr.* in the light of report of the Expert Committee headed by Justice B.C. Patel, former Chief Justice of Delhi High Court. The Tribunal accepted the report of the said Committee which *inter-alia* recommended as follows:-

> "7. *Recommendations to avoid future incidents and other questions are as per the report Mark Annexure 28.*
>
> ***SECTION 8***
>
> ***STEPS REQUIRED TO AVOID SUCH INCIDENT (NATIONALDISASTER MANAGEMENT AUTHORITY)***
>
> *55. The question is how such accidents can be avoided. There is National Disaster Management Authority (NDMA) of the Government of India, which has issued guidelines for Chemical Disasters (Industrial).*
>
> *56. The common causes for chemical accidents, deficiencies, safety management system and human errors are noted. The chemical accidents fire, explosion and/or toxic release were resulting irreversible pain, suffering and death.* ***To minimise such accident and to improve emergency preparedness at all levels, substantial efforts are still required to predict the occurrence of disaster****. (Page xvii)*
>
> *57. It is also stated that it has been realised that* ***effective Chemical Disaster Management (CDM) is possible by the adoption of preventive and mitigation strategies as most chemical disasters are preventable in comparison to natural disasters that are difficult to predict and prevent. Statutory inspection, safety audit and testing of emergency plan, onsite emergency plan, offsite emergency plans, medical emergency plans, information on chemical, technical information have been given importance.***
>
> *xxx……xxx……xxx*

5. Shortage and training of manpower:

viii. It is necessary to appoint adequate number of Scientists and other officers as well as other staff considering the number of industries so as to effectively monitor the manufacturing units. Shortage of staff is also referred in the report of the Comptroller and Auditor General of India on Environmental Clearances and Post Clearance Monitoring 2016 that there are shortfalls in monitoring of environmental parameters. One of the reasons mentioned in the report is the shortfall/inadequate staff. Considering the numbers of Environmental clearance by MoEF & CC, New Delhi as well as SEIAA Gujarat (No. of ECs issued by MoEF & CC, New Delhi- Approx. 1500 & by SEIAA Approx. 8300 for the state of Gujarat only), the scientific staff in Ministry's regional offices should be strengthened for post EC monitoring at regular intervals. Thus, for having an eye over all the units, the Committee feels that the government should take appropriate steps for appointing adequate staff. The PESO also pointed out the same concerned the Gujarat being most industrialized state having about 40,000 licensed premises covered under various Acts and Rules including 1800 Major Accident Hazards premises, this is one of the pressing problems.

ix. *The manpower of the DISH in the industrial area must be related to the numbers of units in the area. Considering the incident and the quality of the inquiry made by DISH, it is desirable that proper training should be imparted to the officers of the DISH. This will improve the efficiency of DISH.*

6*….xxx…….xxx…….xxx*

7. Management & study:

xiii. HAZOP study direction / instruction must be carried out strictly and regularly by the unit.

xiv. Management to educate the staff on Materials Safety Data Sheet (MSDS) and engineers & operators in the plant must study the same.

7. DCG, Hospitals:

xv. All Industrial Zone/SEZ should have their own Local Crisis Group. The District Crisis Group should give surprise visit to the factories regularly at least once in a quarter and check the operation of factories. At the end of the visit, they should generate a report and submit to the State Crisis Group.

xvi. As per the Chemical Accidents (Emergency, Planning, Preparedness, Response) Rules, 1996, brought out under the Environment Protection Act 1986, it is mandatory to have

State Crisis Group (SCG) and District Crisis Group (DCG) to help the State Disaster Management Authority (SDMA) and District Disaster Management Authority (DDMA) under the Disaster Management Act, 2005 in advisory roles to deal with Chemical Disaster Management (CDM). There is no emergency response centre / disaster management centre within the SEZ. Therefore, the authorities must provide urgently such centers. As the Industry in the instant case failed to report in this behalf there must be a provision for not reporting immediately to the DCG and DDMA or at emergency control room for chemical disasters in the state (as in the instant case it is at Vadodara). The Rule making authority though having prescribed 48 hrs. time limit within which the competent authority is required to be informed but there is no provision for the breach with regard to non-informing immediately or within 48 hrs. (In the instant case it is admitted the report was submitted on 9th June, 2020 against the incident on 3rd June, 2020).

xvii. ***The requirement of a Hospital in an industrial zone or SEZ and particularly industries are engaged in hazardous chemicals is a must. Even Hospitals at distance of 50 kms are general hospitals and not specialised in chemical burns and injuries arising out of accident on account of hazardous materials.***

xviii. District crisis group must undertake mock drill under off site emergency plan and crisis management in every industrial cluster or SEZ on failure action should be taken against DCG. (In the instant case they were satisfied with mock drill in one place in a district. In the instant case in one district there are more cluster of industries. Therefore, in each cluster an exercise aforesaid is a must – DISH has admitted that such exercise is not carried out in all clusters).

xix. As at other places in the state of Gujarat in the industrial clusters, the GPCB has provided tower for air quality monitoring and same is being monitored by the GPCB. Dahej – I & II or the SEZ being an industrial town and factories are particularly engaged in hazardous chemicals, the committee is of the opinion that there should be Continuous Ambient Air Quality Monitoring Systems (CAAQMS) at all strategic locations. So that everyone in that area is aware about the air pollution.

8. <u>Safety audit:</u>

xx. *For the purpose of auditing the safety,* ***the government must make a panel of safety auditors to inspect the factory independently twice in a year and they should submit their report directly to the DISH. The safety auditor should be made answerable to the government.***

xxi. The committee is of the opinion that sub-rule (9) of Rule 68(J) of the Gujarat Factories Rules 1963, refers to safety report and safety audit reports, under that Rule sub rule 2 gives a choice to industry to select the auditor for the purpose of the safety audit. The committee of the opinion that the state government be requested to consider the case and particularly

safety report from independent auditor and to amend the Rule as below:

2). After the commencement of these Rules, the occupiers of both the new and existing industrial activities and isolated storage must be checked by the government through the safety auditor which is accredited by an accreditation board to be constituted by the Ministry of labour, Government of India.

3). The auditor within 30 days of audit shall send the report to the chief inspector with respect to the audit recommendations and which shall be examined by the government within a period of 1 month and the industry shall be directed to carry out within the period specified the recommendation that may be made by the Government in this behalf."

8. In the present case also we find similar recommendations. After consideration of the matter in the above earlier case, the Tribunal issued following directions in the said matter:-

"28. We do not find any tangible objections to the report of the Committee which stand accepted. The recommendations of the Committee need to be duly implemented which needs to be overseen by the statutory regulators. We note that in the recent past the Tribunal has come across the number of incidents of leakage of gases and handling of hazardous chemicals. On investigation, this Tribunal has found that most of the accidents are result of non-compliance of laid down safety norms under the 1989 Rules and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 [1996 Rules]. There is, thus, need for the establishments handling hazardous chemicals to strictly follow the laid down norms, which need to be overseen by the statutory regulators.

29 to 31xxx……xxx……xxx

32. ***In view of frequent accidents resulting in deaths and injuries, the Chief Secretaries of all the States/UTs may evolve a mechanism to ensure that the companies dealing with hazardous substance must forthwith pay compensation for deaths and injuries to the victims at least as per Workmen Compensation Act, 1923 wherever applicable or the principle of restitution laid down in Sarla Verma (supra), National Insurance Company Ltd. v. Pranay Sethi, (2017) 16 SCC 680 to the victims either directly or through the District Magistrate.***

33. Conduct of safety audits of all establishments having potential for such accidents may be ensured. All States/UTs

may also ensure availability of healthcare facilities in the vicinity of such establishments. PCB and DM must assess cost of restoration of environment which should be recovered from company and spent on such restoration. The States and UTs in accordance with 1989 and 1996 Rules need to step up vigilance, surveillance and monitoring to avert such accidents. Preparedness to meet such eventualities be ensured. Regular mock drills may be ensured in respect of onsite and offsite emergency plans. We may also refer to the directions issued by this Tribunal to the MoEF&CC and all the States/UTs on the subject of strengthening regulatory and oversight measures, vide order dated 01.02.2021 in OA 837/2018, Sandeep Mittal vs. Ministry of Environment, Forests & Climate Change & Ors."

9. It is thus clear that there are violations in following requisite safety protocols and monitoring and absence of adequate health facilities in the vicinity. Learned Counsel for the Project Proponent fairly stated that the unit in question will follow all the recommendations of the Committee including payment of compensation for the damage to the environment, remedying the inadequacies in the infrastructure and all safety precautions for future. Entire safety aspects will be reviewed in terms of SOP, HAZOP, Qualitative and Quantitative Risk Assessment and other gaps identified by the Committee.

Compensation to the victims and restoration of environment

10. While accepting the report, we note that substantially the compensation assessed has been already paid to the victims. Remaining amount, if any be paid. We further approve the compensation for damage to the environment and the same may be credited to a separate account by the industrial unit for being spent on restoration of the environment by preparing an action plan, to be approved by the State PCB and the CPCB. The plan may focus on developing relevant infrastructure to prevent such accidents and provide relief in case such untoward incident happens. The said step will be apart from other measures suggested by the Committee.

Compliance of recommendations for remedial action

11. We find that it is necessary to require an action taken report to be filed by the Chief Secretary, Gujarat who may hold a joint meeting with District Magistrate, Bharuch, the Director Industrial, Safety, the Member Secretary, State PCB and the GIDC within one month. The Chief Secretary may ensure that all the remedial measures have been adopted in terms of the report and file an action taken report within three months with the Tribunal 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. The Chief Secretary, Gujarat may also issue instructions for requisite safety measures for all other industrial units in the State having potential for such accidents. The action taken report may include status of risk-policies taken by the industries to cover health and safety risks of persons engaged or likely to be affected and compliance of 1989 and 1996 Rules. The action taken report may also mention the remedial measures taken in respect of 11 other units mentioned in the report viz:-

1. Air Liquid India Holding Pvt Ltd.
2. Cheme Organic Chemicals
3. Galaxy Surfactants Ltd.
4. J M Hubar India Pvt Ltd.
5. Klg Organic Ltd.
6. Lanxess India Pvt Ltd.
7. Panoli Intermediate (India) Pvt. Ltd.
8. Saint Gobain Glass India Ltd.
9. Shriram Alkali & Chemicals (A unit of Dcm Shriram Consolidated) Ltd.
10. Upl Ltd. (Unit-5)
11. Vardhman Acrylics Ltd.

12. We also direct CPCB and MoEF&CC in coordination with other concerned authorities to consider issuing appropriate guidelines for conducting safety audits and taking other remedial measures throughout India in the light of present report as well as other recent reports in

respect of industrial accidents so as to prevent such incidents and to save human lives and health.

13. We place on record our appreciation for the task executed by the Committee. CPCB may convey this observation to the members of the Committee. The report of the Committee may be placed on websites of the State PCB and the CPCB for purpose of reference for six months.

The application is disposed of except for considering the action taken report which may be filed in pursuance of the above order.

The same may be put up for consideration on 09.11.2021.

A copy of this order be forwarded to the Chief Secretary, Gujarat, the District Magistrate, Bharuch, the Director Industrial, Safety, the Member Secretary, State PCB, the GIDC, MoEF&CC and the CPCB by e-mail for compliance.

Adarsh Kumar Goel, CP

Sudhir Agarwal, JM

M. Sathyanarayanan, JM

Brijesh Sethi, JM

Dr. Nagin Nanda, EM

June 11, 2021
Original Application No. 60/2021
SN

JOINT COMITTEE REPORT

Of

M/S. UPL Ltd (Unit-5), Plot No. 746, 750, GIDC Jhagadia, Tal: Jhagadia, Dist.: Bharuch, Gujarat

IN COMPLIANCE OF ORDER DATED 25/02/2021 OF HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL BENCH, NEW DELHI IN THE MATTER OF

[O.A. NO. 60/2021]

Deputy Director
Industrial Safety
And Health
Bharuch

Gujarat Pollution
Control Board,
Regional Office
Ankleshwar

Central Pollution Control
Board,
Regional Directorate
Vadodara

सत्यमेव जयते
Collector & District
Magistrate
Bharuch

April 2021

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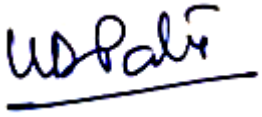
REPORT OF COMMITTEE IN COMPLIANCE OF ORDER OF HON'BLE NGT, PRINCIPAL BENCH, NEW DELHI IN THE MATTER OF
O.A. NO. 60/2021
WRT FIRE ACCIDENT AT UPL PLANT (UNIT-5), JHAGADIA and DIST: BHARUCH, GUJARAT

COMMITTEE MEMBERS

Name	Organization	Signature
Dr. M.D.Modiya	Collector & District Magistrate of Bharuch (IAS), collector office Bharuch, Gujarat	
Shri Amit Thakkar	Scientist 'D' Central Pollution Control Board (CPCB), Regional Directorate(West), Vadodara, Gujarat	
Shri R.R.Vyas	Regional Officer, Gujarat Pollution Control Board (GPCB), Regional Office, Ankleshwar, Gujarat	
Shri N.D.Vaghela	Deputy Director, Industrial, Safety & Health, Bharuch, Gujarat	
Dr. Upendra D.Patel	(Expert Team member) Professor & Head Civil Engineering Department, Faculty of Technology & Engineering, MS University of Baroda, Vadodara, Gujarat	
Shri. P.S.Keshwani	(Expert Team member) Senior Officer, Safety department - Gujarat Narmada Valley Fertilizer Company Ltd (GNFC) Bharuch, Gujarat	

1 BACKGROUND

In reference to the News item published in The Hindu dated 23/02/2021 titled "Two dead, 5 missing" in fire at UPL Plant (unit-5), GIDC Jhagadia, Dist: Bharuch, Gujarat, (herein now referred as 'unit') the Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi took up the matter on suo-motu basis in the application no. 60/2021 on 25/02/2021, and issued following orders on 25th Feb 2021:

"While directing issuance of notice to the UPL Ltd., Jhagadia, District Bharuch, Gujarat, Director, Industrial Safety and Health (DISH), Gujarat, State PCB, CPCB, District Magistrate, Bharuch and the MoEF & CC by e-mail, we constitute a four-member joint committee comprising of the CPCB, State PCB, DISH and the District Magistrate, Bharuch to give a report to this Tribunal. The nodal agency for coordination and compliance will be the CPCB and the State PCB.

The committee may visit the site preferably within next one week and give its report with reference to issues mentioned in para 3 within one month by email at judicial-ngt@gov.in, preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF. Simultaneously, the report may also be uploaded on the website of the State PCB to enable the concerned stakeholders to access the same and file their response, if any."

" Except for visit to the site at least once, the Committee will be free to conduct its proceedings online. It will be free to take the assistance from any other expert/organization. The Committee may suitably interact with the stakeholders and, apart from considering the present accident, also consider remedial measures for preventing such accidents in the area or by other establishments even beyond the said area. The Committee may compile information about existence and working of onsite and offsite plans in terms of 1989 Rules and conducting of mock drills and safety SOPs., number of such units in the area and the carrying capacity of the area to sustain the same. Since in the recent past, the Tribunal has dealt with similar issues of industrial accidents resulting in deaths and injuries and Expert Committees in some of such accidents have given reports to this Tribunal, such reports may also be taken into account by the Committee to the extent relevant."

A copy of the Hon'ble NGT order dated 25/02/2021 is given at **Annexure -1.**

In compliance of the order, a joint committee comprising following members along with Shri P.L. Vithani, Sub-Divisional Magistrate (hereinafter referred to as 'SDM'), Jhagadia and other officials from Gujarat Pollution Control Board (hereinafter referred as "the GPCB") carried out the first inspection-cum-monitoring of the unit on 04/03/2021.

- Dr. M.D.Modiya (IAS),
  Collector & District Magistrate of Bharuch, Gujarat
- Shri Amit Thakkar, Scientist 'D',
  Central Pollution Control Board, Regional Directorate, Vadodara, Gujarat

- Shri R.R.Vyas
  Regional Officer, Gujarat Pollution Control Board (GPCB)-Regional Office, Ankleshwar, Gujarat
- Shri N.D.Vaghela
  Deputy Director, Industrial, Safety & Health, Bharuch, Gujarat
- Dr. Upendra D.Patel (Expert Team member)
  Professor & Head Civil Engineering Department, Faculty of Technology & Engineering, MS University of Baroda, Vadodara, Gujarat
- Shri. P.S.Keshwani (Expert Team member)
  Senior Officer, Safety department - Gujarat Narmada Valley Fertilizer Company Ltd (GNFC)-Bharuch, Gujarat

The committee again visited and interacted with representatives of the unit on 09/03/2021 for collection of data, interaction with the officials of the unit present during night shift on the day of the accident etc.

2 APPROACH / METHODOLOGY

The committee convened a meeting on 04/03/2021 amongst the members for information sharing among concerned departments viz Directorate of Industrial Safety & Health (DISH), Gujarat Pollution Control Board, District Magistrate and Central Pollution Control Board and adopted following approach in compliance of the order of the Hon'ble NGT:

- Visit and inspection of the accident site & surrounding area: The committee carried out detailed site inspection and surveyed the surrounding area on 04/03/2021 and 09/03/2021. During inspection, based on prima facie evidences, sampling of soil from Gumanpura Village and wastewater from the unit were collected for analysis. The samples were collected and analysed by GPCB.
- Interaction with personnel of unit: The committee interacted with the representatives of the unit and the personnel present on duty during the accident. Collection of evidences and other information: The committee collected various permissions, records, HAZOP, Safety audit reports etc. pertaining to the CM-257 plant where the accident took place. Various evidences in terms of CCTV footage from nearby industries were also obtained and referred.
- Compensation Calculation: The committee has referred various reports as mentioned in the order of Hon'ble NGT, various orders of Hon'ble Supreme Court of India for calculation of compensation to deceased personnel and damage to the environment. In addition information about the product was also collected from internet and various literatures.
- Assessment of safety preparation by unit: Inputs from DISH regarding working of onsite emergency plan, Mock Drill, Safety SOPs etc. were taken. In addition present gaps in the infrastructure in the GIDC for fire fighting and health facility were also assessed.

3 ABOUT THE ACCIDENT

The accident of blast followed by fire in the premises of the unit took place at 1:47 AM on 23/02/2021 in the reactor (stage I, CM-257 Plant). During the accident, the plant process was under shutdown owing to boiler maintenance and inspection. As informed by the representatives of the unit, the CM-257 plant was taken under shutdown on 04/02/2021 and materials at intermediate reaction stages were stored in the different reactors of the plant during such planned shutdown. The reactor in which the blast took place was having about 8.0 T of Ethyl Thio Butanol (ETB) which is the first stage intermediate product in the manufacturing of the final product, namely Clethodim which is herbicide, in CM-257 plant.

The blast was so massive that it felt like an earthquake in the entire area resulting into death of 07 personnel working in the plant, injury to 53 personnel within the premises, damage of other reactors/tank farm containing various chemicals as mentioned in the table below, other infrastructure including the DCS building, sheds of other plants and glass of windows inside the premises of the unit. **The chemicals completely lost due to accident were either burnt out and emitted into the air, or drained out along with runoff water used for controlling fire.**

Table 1: List of chemicals and their Quantities lost during the accident

Reactor/ Vessel No.	Chemical stored	Chemical formula	CAS No.	Quantity lost, kg
R-25001	Ethyl thio butanol	$C_6H_{12}OS$	27205-24-9	8500
V-25035	Triethylamine	$C_6H_{15}N$	121-44-8	112
V-25002	Ethyl mercaptan	C_2H_5SH	75-08-1	1000
V-25003	3-methylpiperidine	$C_6H_{13}N$	626-56-2	1302
T-25007	Step-3 and 5 Wash toluene	C_7H_8	108-88-3	27000
T-25011	Step-4 organic mass with Toluene	$C_{16}H_{24}O_5S$	Not Available	3666
T-25045	Step-4 organic Mass with Toluene	$C_{16}H_{24}O_5S$	Not Available	712
R-25014A-step 9	(1E)-3-(aminooxy)-1-chloroprap-1-ene. HCL	$C_3H_6ONCl.HCL$	96992-71-1	14000
R-25016A-step 9	(1E)-3-(aminooxy)-1-chloroprap-1-ene. HCL	$C_3H_6ONCl.HCL$	96992-71-1	14000
C 25008	Ethanol stripper- Ethanol water	C_2H_5OH	64-17-5	1500

Effect of the blast on neighbouring industries was observed which included breaking of window glass and glass panels, cracks in walls & POP false ceiling etc. The committee has explored various aspects like referring to available literatures, documents/ records submitted by the unit, interactions with various officials of the unit, report submitted by DISH, internal investigation report submitted by the unit, safety aspects, inputs from the experts etc. for analysis of the probable cause of the accident. Details about the unit where the accident took place and action taken by various authorities under their respective jurisdictions are mentioned in the subsequent paragraphs.

4 ABOUT THE UNIT WHERE THE ACCIDENT TOOK PLACE

United Phosphorus Limited (UPL) Group is engaged in manufacturing of wide range of chemicals including Agrochemicals, Caustic Soda, Chlorine, Specialty Chemicals etc. in different establishments located at Vapi, Ankleshwar, Halol, Jhagadia, Jammu, Haldia and other countries like UK, France, Netherland, Brazil, Argentina etc.

The accident took place in the unit of the UPL group, located at Plot No. 750 & 746, GIDC Jhagadia. A google image showing location of the unit is as depicted below:

Google earth image showing M/s. UPl Ltd, (unit-5), Jhagadia

(Source: Google earth)

The unit has obtained various authorization, permission, Consent for manufacturing of various agrochemicals, specialty chemicals, caustic chlorine etc. and storage of various chemicals. Details of the latest permissions obtained by the unit are as mentioned below:

4.1 List of latest permissions

Table 2: Details of the latest permissions obtained by the unit are as mentioned

Sr No.	Permissions obtained by unit	Document/ license no.	Issue date	Valid up to	Name of Department
1.	Environmental Clearance	F.No.J-11011/80/2015-IA-II(I)	05/04/2018	04/04/2025	MoEF&CC
2.	Consent to Operate (CTO)	AWH-108451	21/10/2020	19/11/2024	GPCB
3.	Storage for petroleum/ explosive material	P/WC/GJ/15/2727 (P445925)	13/07/2020	31/12/2029	PESO
4.	Approved site plan	--	24/03/2020	--	DISH
5.	License under the Factory Act	5514	16/10/2020	31/12/2022	DISH

Details of all permissions mentioned above table no. 2 are enclosed in **Annexure- 2.**

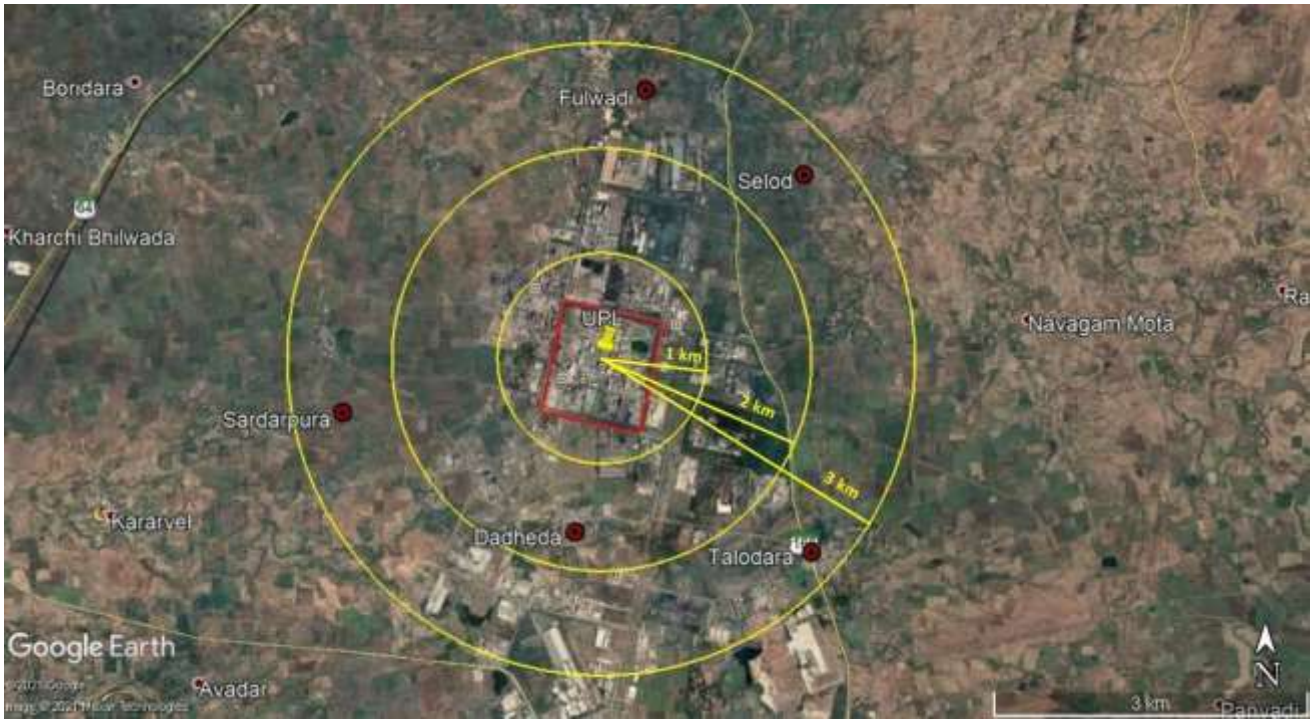
4.2 Details of Surrounding villages/other industrial units

The committee collected information about the surrounding villages and other industries located in the vicinity of the unit. The details about the surrounding villages and industries are provided in Table 2 and Table 3 respectively. The Google image of villages and industries located surrounding the unit are shown below the tables.

Table 3: The location of the surrounding village located in the vicinity of 3 km is given below:

Sr No	Name of village	Population As per Census 2011	Aerial Distance from UPL Unit-5, Jhagadia	Direction from UPL Unit-5 Jhagadia
1	Dadheda	1094	0.95 km	S
2	Talodra	2057	2.09 km	SE
3	Sardarpura	456	2.10 Km	W
4	Selod	1653	2.16 Km	NE
5	Fulwadi	1783	2.23 Km	N

Google image showing locations of industries located in the surrounding areas of the unit



(Source: Google earth)

Table 4: The unit is surrounded by following other industrial units

Sr. No.	Name of industry with address	Aerial Distance from UPL Unit-5, Jhagadia	Direction from UPL Unit-5 Jhagadia
1.	DCM SHRIRAM LTD Plot no. 749, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	40 m	N
2.	AARTI INDUSTRIES LIMITED Plot no. 756/4A,B/5A,B/6/7 & 779, 756/6, 41/2, 41/1, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	100 m	NW
3.	GULSHAN POLYOLS LTD Plot No. 762, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	50 m	W
4.	SIKA INDIA PVT. LIMITED Plot No. 916, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	75 m	NE
5.	PANOLI INTERMEDIATES (I) P. LTD. Plot no. 778/1 & 756/1, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	55 m	W
6.	PANOLI INTERMEDIATES (INDIA) PVT. LTD. ($CaCl_2$ plant)	55 m	W

Sr. No.	Name of industry with address	Aerial Distance from UPL Unit-5, Jhagadia	Direction from UPL Unit-5 Jhagadia
	Plot No. 756/11 A&B, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch		
7.	STAR OXOCHEM PVT LIMITED Plot no. 756/10A & 10B, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	182 m	W
8.	S.KUMARS NATIONWIDE LIMITED PLOT NO. 825, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	290 m	S
9.	PRIVI ORGANICS INDIA LTD PLOT NO:765 GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	132 m	S
10.	B E C FERTILIZERS Plot No. 912 & 912-A, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	50 m	E
11.	ASAHI MODI MATERIALS PRIVATE LIMITED Plot No. 913, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	55 m	E
12.	NITREX CHEMICALS INDIA LIMITED Plot No. 772, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	139 m	SE
13.	AMARJYOT CHEMICAL LTD. Plot No. 775/776, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch	55 m	E

Google image showing locations of industries located in the surrounding areas of the unit

(Source: Google earth)

4.3 Brief About Clethodim Product and Manufacturing

The GPCB has issued CCA for manufacturing of Clethodim (CM-257) - 165 MT/Month under 'Change-in-product mix' on 21/10/2020. As per the application submitted by the unit for 'Change-in-product mix' category, the CM-257 would be produced in the existing plant, meaning thereby, that no new plant & machinery was permitted to be installed.

Permission under 'Change-in-product mix' is granted to the unit, based on the request submitted by the unit to GPCB, stating that there would be no increase in pollution load, no new plant would be erected, the product would be manufactured in the existing infrastructure and submitted certification for the same from schedule-I Auditor to the Technical Expert Committee constituted in the GPCB. Based on the records, certificate submitted, presentation done before the Technical Expert Committee and also based on the recommendations of the committee, the consent issued to the unit was amended for manufacturing of Clethodim. Brief of steps involved in manufacturing of Clethodim are mentioned below.

Step 1: Manufacturing of ETB (3-Ethylthio Butanal)

Croton Aldehyde and Triethylamine (TEA) are charged into reactor. Reaction mass is cooled up to 10°C temp. and Ethyl mercaptan is gradually added by maintaining mass temp. 10°C. Post completion of Ethyl Mercaptan addition, RM is slowly heated to 50°C and maintain at the same temp. Vacuum applied to remove unreacted ethyl mercaptan and remaining mass in reactor is used for next step.

Once ETB is prepared, the temperature in the reactor is increased to 50 degree C to remove the excess amount of ethyl mercaptan. The vapours of ethyl mercaptan are then sucked under vaccum for scrubbing with crotonaldehyde as a scrubbing medium. The reactor is provided with a vent (100 mm dia SS 316L) after the scrubber.

Step 2: Manufacturing of 6-Ethylthio-3-Hetane-2-One

Methyl Aceto Acetate and water are charged into reactor at 25°C. 48% NaOH is gradually added in the reactor at 25°C and RM maintained under stirring at 25°C. Adjust pH using conc. HCl to 8.3. Added Catalyst Methyl Piperidiene (Cat P-9) and toluene. ETB(Step-1) is gradually added and reaction is maintained under stirring at 35°C. Layer separation is done. Aq. Layer is sent to ETP and organic layer has given wash of 2% NaHCO3 solu followed by water to remove acidity. Organic layer is distilled under vacuum to get 36-40% soln product in toluene and used for next step.

Step 3: Manufacturing of methyl 6-[2-(ethylsulfanyl) propyl]-4- hydroxy - 2- oxocyclohex-3-ene-1-carboxylate

Dimethyl Malonate and 25% Sodium methoxide soln in methanol are charged into the reactor at 25°C. Cool the mass to 10°C and 36-40% soln Step-2 product in toluene is added gradually. Sodium methoxide powder and toluene are added and stir at 20°C. RM is cooled to 10°C and added water.

Layer separation done, organic layer sent for toluene recovery and toluene, HCl added in aq. layer. Layer separation done, organic layer again washed with 20% NaCl to remove traces of methanol. Layer separation done, and organic layer transferred to next step.

Step 4: Manufacturing of Stage-4

Organic layer is sent for azeotropic distillation of water and 45% soln product in toluene formed. In this mass, Propionic Anhydrite (AP-13) & Dimethyl amino Pyridiene (Cat PD-12) are added in the reactor at 50°C. This mass is heated to 90°C and maintained at the same temp. under stirring. RM is cooled to 40°C and continuously extracted twice with water. Aq. Layers sent for catalyst & PA recovery and organic layer used for next step.

Step 5: Manufacturing of Stage-5

Step-4 product is charged into the reactor at 35°C. Cool to 20°C. 48% NaOH and water are added simultaneously in the reactor by maintained under stirring by keeping the temp. below 35°C. Layer separation done. The organic layer sent for toluene recovery and aq. layer is used for next step.

Step 6: Manufacturing of Triketone Intermediate

Step-5 aq. Layer and n-hexane are charged in the reactor at 35°C. Then RM is heated to 50°C and conc. HCl is added and RM is maintained under stirring. Cool the mass to 20°C and layer separation done. Aq. Layer sent for evaporation and n-hexane is distilled out from organic layer using evaporator from top and Triketone formed at the bottom is collected and used in Step-10.

Step 7: Manufacturing of Acetyl Hydroxyl Amine (AHA)

Water and Hydroxylamine sulfate are added in the reactor at 5°C under stirring. Gradually Ethyl aceate is added followed by 48% NaOH soln at 5°C and RM is cooked at 35°C to form AHA and it is used for next step.

Step 8: Manufacturing of Acetyl Chloro Propenyl Hydroxyl Amine (ACPHA)

AHA and 48% NaOH are charged into the reactor at 35°C. Then 1,3 Dichloropropene is gradually added in the reactor at 35°C and mass heated to 55°C and maintained at same temp. under stirring. ACPHA is formed and used in the next step.

Step 9: Manufacturing of Chloro Propenyl Hydroxyl Amine (CPHA)

ACPHA and 30% HCl are added in the reactor at 45 to 55°C. RM is cooked at the same temp. under stirring. Ethanol+Water recovery is done, and the remaining mass is cooled to 20°C followed by the 48% NaOH addition. Water is added to dissolve the solids and density difference. Two MDC washes given to Aq. Layer to remove impurities and again 48% NaOH & water added. RM is continuously extracted with MDC followed by MDC recovery. Crude CPHA generated is used in the next step.

Step 10: Manufacturing of Clethodim (CM-257)

Crude CPHA(Step-9) and Triketone (Step-6) are charged into the reactor at 35°C and then cooked at 45°C for under stirring. Then RM is cooled to 20°C followed by addition of 10% NaOH solution to increase the pH of RM to 12 and two toluene washes given to Aq. layer for impurities extraction. Organic layer sent for toluene recovery and continuous 10% HCl added in the Aq. Layer and then its continuously extracted with toluene followed by water. Aq. Layer sent for evaporation and Organic layer sent for toluene recovery from top and final product CM-257 withdrawal from bottom.

The process flow diagram, chemical reactions, list of raw material etc. are provided in **Annexure-3.**

During discussion with the officials of the unit and while collecting information about the plant used for the production of Clethodim in plant CM-257, it is understood that the product manufacturing process was developed by the UPL group based on internal R&D. The scale-up of project, basic engineering & detailed engineering of the plant CM-257 was carried out by the UPL Group. It was informed that the first batch was produced on 27/11/2020 and till the date of accident, about 153 MT of product was manufactured which was stored in the premises. The Clethodim requires a specific storage condition of 0-5 deg. C temperature.

The information available on the internet reveals that the product (Clethodim) manufacturing state of art facility is developed by the unit after acquisition of M/s Arysta Life science. While collecting the information about the product, another accident of a similar product in china was also reported. Some of the news available on internet is mentioned below:

AgriBusiness GLOBAL (Formerly FCI) Agrochemicals Biopesticides Plant Health Seeds & Traits Markets

UPL Opens Clethodim Facility in India

By **UPL Ltd.** | 15 December 2020

UPL Ltd. on Dec. 15 announced the opening of a state-of-the-art manufacturing facility in Jhagadia, located in the state of Gujarat, India. The facility will support the production of clethodim, one of the largest selective post-emergence herbicides in the world used to control annual and perennial grasses in a wide variety of crops.

Clethodim was brought into the UPL product portfolio through the acquisition of Arysta LifeScience; after only 20 months post-integration, the company's vision of expanding its in-house production capabilities has become a reality.

(Source: https://www.agribusinessglobal.com/agrochemicals/upl-opens-clethodim-facility-in-india)

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Factory explosion in China kills five

14 FEBRUARY 2020

An explosion on February 11 killed five people and injured 10 in China's northeastern Liaoning Province. The incident occurred at a chemical factory in Huludao where the blast caused a significant fire which took until the following morning to put out.

The explosion occurred around 19:50 local time at a factory which produces clethodim herbicide, a chemical which is used to control annual and perennial grasses in a wide variety of broad leaf crops.

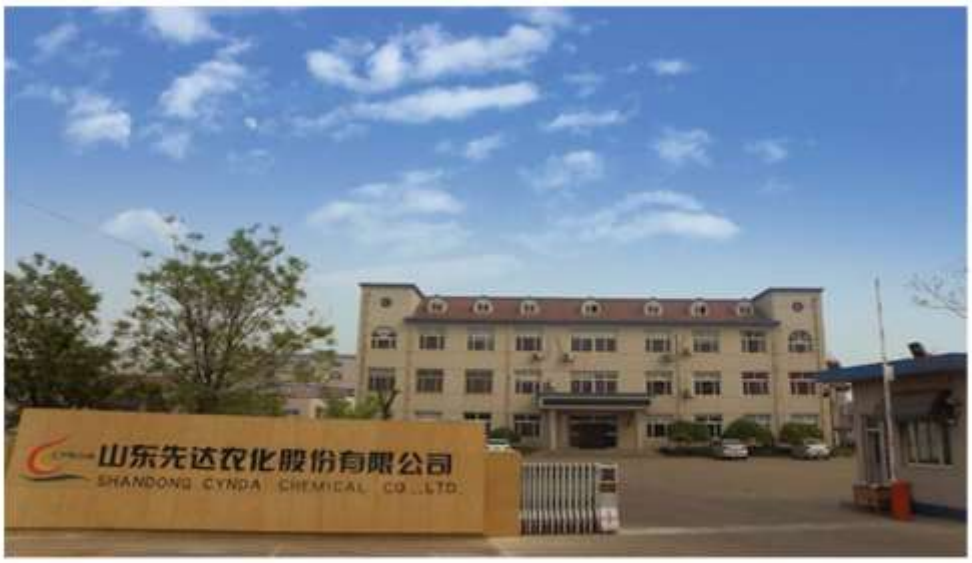
The 10 people injured by the explosion are in a stable condition, local authorities said. An investigation into the cause of the blast has begun and all operations at the plant have been suspended until further notice.

According to local media, the plant's director was detained by police. Environmental tests were conducted at the site, but no gases were found.

Representative image: Shutterstock

(source of data: https://www.hazardexonthenet.net/article/176943/Factory-explosion-in-China-kills-five.aspx)

DATE: FEB 13 2020 / SOURCE: YICAI



Blast at Major Chinese Pesticide Maker's Plant Kills Two, Hurts 10

"(Yicai Global) Feb. 12 -- An explosion that occurred at the clethodim plant of leading Chinese herbicide maker Shandong Cynda Chemical's Northeast China unit yesterday has thus far claimed two lives, injured another 10 people, and resulted in the loss of contact with three others, the firm announced today.

The firm's shares [SHA:603086] also felt the force of the blast, plunging to a nadir of CNY20.16 (USD2.89) during the day, though firming in the afternoon to close down 4.33 percent at CNY21.43.

The subsidiary of the pesticide producer based in China's eastern Shandong province is Liaoning Cynda Chemical. Formed in 2017, the unit, which has CNY280 million in registered capital, mainly researches, makes and sells pesticides and their intermediates and preparations. The 3,000-ton clethodim plant, which started trial production in December has not yet reached full capacity".

(Source of data: https://www.yicaiglobal.com/news/blast-at-major-chinese-pesticide-maker-plant-kills-two-hurts-10)

Similar accident of explosion has occurred in Clethodim plant located in China in 2019. Thus, Manufacturing of products such as Clethodim involves great risk owing to the use of hazardous/highly reactive/non-compatible chemicals at various stages of its manufacturing. A detailed and in-depth study of risk assessment of each stage of manufacturing is imperative.

5 CAUSE OF ACCIDENT AND ACTION TAKEN

5.1 Action taken by DISH

The officials of DISH received information over telephone at around 02:15 Hrs dated 23/02/2021 regarding the accident at unit-5 of M/s. UPL Ltd, Jhagadia. The officials of DISH reach the site around 03:00 Hrs. DISH arranged additional fire tenders & ambulances from nearby industries located in Jhagadia GIDC & Disaster Prevention and Management Centre (hereinafter referred to as 'DPMC') located at Ankleshwar and Dahej.

SDM & DISH has immediately served head-count notice on 23/02/2021 (Copy of the same is in **Annexure - 4**). The reply submitted by the unit is in **Annexure - 5**. As per the reply, total 2 persons reported dead and 5 persons were missing.

DISH has also issued a letter on 23/02/2021, directing the unit to close down the manufacturing activities in all plants within the premises. (copy of the same is in **Annexure - 6**)

DISH has given breach of law remarks under schedule 19 part (2), Rule 102, para no. 5 of The Gujarat Factory Rules- 1963 dated 05/03/2021 to M/s. UPL Ltd (Unit-5). Based on the submissions by unit, DISH has filed a criminal case against the occupier in the Additional Chief Judicial Magistrate court at Jhagadia (Breach of law remarks by DISH is as **Annexure - 7** and reply by unit in this regard is attached in **Annexure - 8**).

5.2 Action Taken by Local Police

Jhagadia police station has registered the accidental death No. 6/2021 under section 174 of Criminal Procedure Code and prepared detailed 'Panchnama' of accidental location in vernacular language Gujarati dated 23/02/2021 at accident site during 16:30 to 18:30 Hrs. As per 'Panchnama', death of three persons & missing of four persons is reported. The investigation is still under progress.

5.3 Action Taken by GPCB

After the accident, a team of officials from GPCB, Ankleshwar reached the place on 23/02/2021 at around 04:15 hrs. The officials of other departments present at the site were; 1) Sub Divisional Magistrate, Jhagadia, 2) Police officials, 3) Officers of DISH, 4) Officials of GIDC, 5) Mamlatdar, Jhagadia.

- On reaching the site, visual inspection of the area surrounding the unit was carried out considering the smoke emitted with plume direction and firefighting activity. Considering the prevailing wind direction during the accident from N-NE to S-SW, the GPCB monitored Ambient Air Quality for Volatile Organic Compound (VOC) and Hydrocarbons by a Handy VOC meter in the downwind direction of the location of the accident, which included the village habitation (details included in **Annexure-9**). During the monitoring VOC emission in prevailing wind direction was measured having maximum level @ 12.6 ppm. VOC of @ 23.8 ppm was measured outside the premises at the location, North of the CM-257 plant. General hydrocarbon at two locations i.e. near the main gate of the unit and at the back side of the unit i.e. in the downward wind direction it is observed @ up to 5 ppm. Based on these monitoring results, the local authorities i.e. SDM, Jhagadia & DISH decided that evacuation from nearby villages would not be required. The GPCB also monitored Ambient Air Quality with Respirable Dust Sampler (RDS) kept on the terrace of the Police station, located near the premises of the unit during 09:00 Hrs to 17:00 Hrs. on 23/02/2021, which did not show about any alarming situation.

- There was generation of contaminated wastewater during the firefighting operations. The contaminated wastewater accumulated in the storm water drains (hereinafter referred to as 'SWD') within the premises of the unit and subsequently, was observed flowing in dry GIDC storm water drain. The contaminated wastewater in the GIDC SWD is observed entering into a kutcha natural drain/trench starting near M/s Lanxess India Pvt. Ltd. and the same was observed to have reached till the portion of the natural drain/trench passing near village Gumanpura. Samples of contaminated wastewater generated during firefighting were collected from various locations within & outside the premises. It was observed that contaminated wastewater did not reach Boridra nalla, where this natural drain/trench leads to. The Boridra nalla is also observed dry. The unit was directed to collect the contaminated wastewater generated during the firefighting, that was accumulated within the premises and also that had flown outside the premises. Based on the instruction, the unit has started lifting wastewater from drains inside the premises and from the

natural drain/trench by making a temporary bund in the natural drain/trench passing near Gumanpura Village. The wastewater was lifted, carried through tankers and stored in the guard pond sump near the ETP within the unit's premises. The unit also carried out scraping soil from natural drain at location i.e. near Gumanpura village road Bridge and sent the dredged soil to TSDF site at BEIL Ankleshwar, manifest copy of the same is attached in **Annexure - 10**. The unit has submitted photographic evidence for lifting of wastewater and dredging of soil.

- GPCB carried out post-monitoring of the accident on 02/03/2021 to verify action taken by the unit. During this visit GPCB visited the affected areas outside the premises (along with representatives from M/s. UPL Ltd (unit-5), Jhagadia) which include the route of earlier flowing contaminated wastewater, GIDC SWD leading to the natural drain and Boridra nalla. During the visit the stretch of GIDC SWD and the natural drain was found dry. One soil sample is also

collected from above mentioned location (area of dredging) near Gumanpura village road Bridge location for analysis purpose. The detailed post monitoring inspection report along with analysis of sample collected are attached as **Annexure - 9**.

- Photographs showing status of Storm water drain and natural drain on the day of accident (23/02/2021) & post monitoring inspection(02/03/2021) are given below:

Location: 1 – Northern side Boundary wall of M/s. UPL Ltd (unit-5)

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 2 – M/s Lanxess India Pvt. Ltd. corner from where GIDC storm water drain meets to natural drain

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 3 –Natural drain leading to Boridra nallah near Kapalsadi village (Lat.21.671193 & long.73.123563)

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 4 – At Gumanpura village road Bridge

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 5 – Natural drain leading to Boridra nallah near Gumanpura village road (Lat.21.679008 & long.73.107435)

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 6 –Boridra nallah in front of M/s. Borosil Ltd.

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

- Based on the inspection report dt: 23/02/2021, the GPCB issued Closure Direction U/s 31 (A) of Air Act on 24/02/2021 (**Annexure - 11**) to M/s UPL Ltd (Unit-5) with reference to the accident occurred in CM-257 plant on 23/02/2021 at early morning hours in the unit. The direction also includes interim EDC of Rs. 1 Crore to be paid by UPL LTD (unit-5), which was subsequently paid by the unit on 25/02/2021.

5.4 Cause of accident as reported by the unit

The in-house investigation report submitted by the unit is attached as **Annexure-12**, wherein based on the list of damaged equipment probable cause of the accident was assessed by the unit. It was reported that leakage of brine (Methanol Water Mixture) took place in the reactor R-25001 which might have resulted in the triggering of exothermic reaction and blast in the reactor. The unit has also submitted a list of equipment, materials which were lost due to the accident.

5.5 Interaction of committee with officials present at the time of accident in the plant/unit.

During the first visit of the joint committee on 04/03/2021, the committee interacted with Shri Vamshi Krishna, night duty officer to get his narration about the accident. He informed that at the time of the blast he was in his controlled room located near the main gate of the unit. In an immediate response, he informed senior officials of the plant about the blast and rushed to the location. According to him, the fire fighters reached the location of the accident within 2 to 3 minutes and started firefighting & rescue activities.

The committee also interacted during the visit on 09/03/2021, with Shri Tejas Borse the shift in-charge of CM-257 plant present for night duty (22/02/2021 – 23/02/2021) on the day of accident. Shri Tejas informed that the plant was on shut down since 05/02/2021 and during the night shift only basic housekeeping was carried out. All the process parameters were under control and at around 01:45 Hrs when he was at the shift in-charge cabin located in the ground floor of the plant, there was a blast however, he could escape from the plant with minor injury. As per his statement, neither knocking nor any indications nor any alert was noticed there prior to the blast.

During the interaction with the firefighting team, present on the day of accident, it was informed by the team that the firefighting team started using fire tender within 4 to 5 minutes however, one of the main fire hydrant line near CM-257 plant was damaged due to blast and hence, the portion was isolated before starting the fire hydrant system. The portion of fire hydrant line located between the plant and tank farm was also not approachable to operate, which had resulted in delayed start of fire hydrant operation.

In addition to above, additional 18 fire tenders from nearby industries & DPMC Ankleshwar and Dahej were used. Moreover, in addition to water about 317 KL of foam was also used for controlling

the fire. The fire was controlled at around 6:30 hrs. however, the water hydrant system was kept operational after fire control to cool down the structure till 8:30 hrs on 23/02/2021.

5.6 Probable cause of accident as per the Joint Committee

Based on the above submission of the unit about the accident, various study carried out by the unit for plant CM-257, HAZOP, safety audit report, accident report from DISH, discussion with the representatives of the unit and field visits, the joint committee draws following observations and conclusions regarding cause of accident:

- The manufacturing process of clethodim was developed in-house by the unit at laboratory level. Studies regarding safety and risk at various stages before converting the lab scale study into kilo-level and pilot-level were not conducted. The reaction conditions maintained in a lab-scale glass reactor cannot be so easily maintained in a plant-scale reactor. The unit has submitted lab scale trial tech-pack documents wherein for an example, the cooling medium used in the laboratory to maintain reaction temp at 5 degree C was chilled water, while the one used in the plant was methanol. An impact / safety aspect of such a change in cooling medium (chilled water to methanol) was not studied during the R&D trials in the laboratory.

- It was informed that the basic engineering and detailed engineering of the plant for CM-257 was carried out in-house and was erected and commissioned in October 2020. The reactor has pressure variation from atmospheric reducing to 50 Torr(Vacuum) and temperature variation of 10 to 50 deg centigrade. As per the P&ID submitted by the unit for stage-I, “the P&ID was issued for approval/Engineering on 02/03/2019”. Considering the above it is understood that the P&ID and detailed engineering was carried out by the unit for manufacturing of CM-257 in 2019. Later on, it was also explained by the unit that construction of the plant for the production of Clomazone and Mesotrion and was initiated during May 2019, then subsequently by Jan 2020 there was no demand for the said products hence, the plant was converted for the production of clethodim/glufosinate/glyphosate by Change-in-product mix permission which contradicts the submission of the unit regarding the commissioning of plant.

- The product developed at R&D stage is further studied and reviewed at various stage like pilot stage and further scale up at design and execution stage for assuring safety during commercial production. During these stages, various data and information are being collected, which require to set design parameters and safety aspects, for engineering design and its execution. Moreover, these data are very essential to design safety instrumentation for the process and are also required for HAZOP study, HAZAN, Qualitative & Quantitative Risk assessment studies and for thermal stability study in case of exothermic reaction. Reports regarding thermal stability, reactivity and other process hazards which may be envisaged at various stages of process is not available with the unit.

- HAZOP study has not covered the design data and operation data of this process such as process hazards pertaining to the exothermic reaction, run away reaction, thermal stability of the product at various stages, impact of utility services leakages, reaction between the reactants and the heating/cooling fluid, imbalance of stoichiometric quantities of various reactants in the reactor, deviation from defined storage conditions for various intermediate stages, mal-function of any instruments, chemical stability of the product at various stages like intermediate and finished stage, etc. These may have resulted in oversight of various process hazards which may occur as a dangerous occurrence like explosion, fire etc.

- As a part of safety and process requirements, the plant was having a DCS control system with multiple temperature, pressure, and level sensors for different rectors. During discussion it is gathered that there were no distress signals before the blast in the DCS system. It is strange that none of the sensors provided for the R-25001 reaction vessel gave any prior distress signals about increase in levels of temperature or pressure due to leakage of methanol and its reaction with ETB mass which might have resulted in increase in temperature as claimed by the unit.

- The unit submitted photographs showing complete damage of the DCS system of CM-257 plant and hence no sensor data could be recovered. Moreover, it was informed that the unit does not have a central DCS centre. Thus, it appears that the systems provided on R-25001 were not adequate in terms of type of sensors, its range, its MOC, DCS data transmission facility to central DCS control etc. Central DCS system, if provided by the unit, would have given very valuable information about changes in the process parameters (temperature, pressure, leakages etc.) which might have occurred resulting in the accident.

- The unit informed that the plant was under planned shutdown (due to boiler shutdown) and the reason for keeping the material (about 8.50 MT of ETB) in intermediate stage in the reactor no. R25001 of CM-257 plant was not justified by the unit. The unit has submitted various work permits of the plant as evidence of shut down. In general, during planned shutdowns for any chemical industry, it is a general practice that the reactors with products at intermediate stages are safely emptied and stored in safe conditions, depending upon the reactivity study/ instability study etc. and defined Standard Operating Procedures are in place for such shutdown and safe startup activities. However, such a study report or defined standard operating procedure (SOP) for safe start-ups and safe shutdown (emergency and planned) are not prepared by the unit.

- The unit has carried out a safety audit from a third party namely M/s Naik & Associcates, Surat. The safety audit report though mentions about the audit carried out for CM-257 plant in page no.08, however, the process detail, manufacturing detail about CM-257 plant is not mentioned in the “Chapter 6 Process and Hazard Information” of the report. Also, detailed about the name of vessel and its location is not mentioned in the report in the section 6.3 - Operational and process hazards with control. As per details of chemical stored in the unit, the actual total stored quantity of toluene, n-Hexane and Methanol exceeds 143 kl (storage permission from PESO to the unit). However, the safety audit report does not mention any observation regarding exceedance in

stored quantity beyond permission limits of PESO. Thus, the safety audit carried out by the unit shows gaps and needs to be carried out again by a competent agency, accredited by an Accreditation Board as per Rule 68 j para 9 of the Gujarat Factory Rules, 1963.

- The unit has informed that many of the chemicals are recovered and the same will be disposed at Common Facility for incineration. One of such recovered chemicals was ETB stored in Tank T-25002 at ground level vertically below R-25001. It was informed that entire quantity (about 9000 kg) of ETB was recovered after the accident and emptied and stored in 9 tanks (each of capacity about 1 T). Thus, the blast in the reactor due to trigger of temperature in the reactor where ETB was kept at intermediate stage cannot be justified as ETB stored in T-25002 could survive an explosion and significantly high ambient temperatures without catching fire or explosion.

- The committee has also collected design details of R25001 from the unit and using the information provided, an attempt is made to calculate the internal pressure built-up/developed responsible for the blast in such a reactor.

Calculation of internal pressure required for explosion of the reactor:

Information provided by the unit:
Reactor No. R25001 (Stage I reactor, wherein the blast took place)
Reactor diameter = 2250 mm,
MOC: SS 316L, and
Wall thickness: 12 mm,
Considering the yield strength of SS 316L = 475 MPa (normally 450-500 MPa) and

Causes of pressurization of such reactor and its failure can be due to:
(1) Circumferential stress = $pD/2t$,
(2) Longitudinal stress = $pD/4t$, and
(3) Shear stress = $pD/4t$ or $pD/8t$.
Here, D=diameter of cylinder, p = internal pressure, and t=thickness of wall.

Substituting details of reactor in above equations, the minimum internal pressure found for circumferential stress is 5.07 Mpa (51.7 kg/cm^2). If such minimum internal pressure is considered to be developed in the reactor and resulted in the blast, development of such a high pressure cannot be instantaneous and without any warning signal unless, either the DCS system was bypassed or non-working or the sensors provided were not adequate in terms of range, specification, safe to give the warning signal. Moreover, it was informed that the reactor is equipped with a vent after scrubber and thus it is not convincing that at a very high internal pressure in the reactor, no fumes/liquid/gas got vented through this vent, releasing the internal pressure and preventing the explosion.

- The joint committee visited the approachable location of plant where the accident took place. Photographs during visit are shown below:






RESTRICTED
AREA

Based on above mentioned observations it can be concluded that the probable reason for the accident i.e. leakage of methanol in the intermediate stage and reaction of methanol with ETB as considered by the unit may be logical in terms of reaction chemistry. However, sudden blast in the intermediate stage of reactor, when the reactor was not in operation and that too after about 18 days, without any sign of abnormality in terms of level, temperature or pressure indicators in DCS, indicates ineffectiveness of safety system provided or assessed by the unit for the plant CM-257. Thus, serious lapses in terms of safety study, reactivity study, compatibility test, development of standard operating procedure for planned and emergency shutdown, storing intermediate stage product during shutdown, gaps in HAZOP, safety audit, inadequacy of sensors provided for the reactor might have resulted in the accident.

6 ENVIRONMENT DAMAGE ASSESSMENT

- The joint committee conducted visits to the unit and affected areas on 04/03/2021 and 09/03/2021. During the visits the committee also inspected the portion of natural drain from where, the unit had dredged soil and collected the samples of soil as detailed below:

Table 5:Details of samples collected by joint committee on 04/03/2021

Sampling point	
W-1	Small patch of Wastewater observed in natural drain leading to in Gumanpura village (Lat: 21.6741970, Long: 73.1139060)
W-2	Wastewater collected from outside and stored in ETP guard pond of UPL Ltd.
H-1	Soil sample collected near Gumanpura village road bridge (Lat:21.674989, Long:73.113248) at nallah
H-2	Soil sample collected near Gumanpura village road bridge (Lat:21.6741970, Long:73.1139060)
H-3	Soil sample collected near Gumanpura village (Lat:21.6790079, Long:73.1074349)
H-4	Soil sample collected near Gumanpura village road bridge (Lat:21.6723874, Long:73.1165128)
H-5	Reference soil sample near Gumanpura village bridge (21.672544, 73.116402)

Analysis reports of the above mentioned samples collected by the committee are attached as **Annexure- 9**.

The Google image showing travelled path (shown in sky-blue color in map) of firefighting wastewater flowed from premises of UPL ltd. to GIDC Drainage system up to M/s Lenxess and then into the natural trench/drain Gumanpura village (wastewater travel @ 5.4 km from UPL)

- It was informed to the committee that the wastewater during firefighting reached a point up to location H3 (as shown in google image above) falling under revenue land of Gumanpura village area and had not reached to Boridra Nalla. The entire stretch of the natural trench/drain including Boridra nalla was dry before the accident.

- During the visit on 04/03/2021, it was observed that the unit had dredged the top layer of the soil in the natural trench/drain passing near Gumanpura village and as reported, 19 MT of contaminated soil was disposed to CHWTSDF, a scientific landfill site. It was also informed that the wastewater was lifted from the bridge on the natural drain near Gumanpura Village by constructing a temporary bund.

- The wastewater was transferred to a guard pond inside the premises of the unit. A sample of waste water from the guard pond was also collected during the visit. It was informed that about 3000 kl of wastewater from inside and outside was collected back.

The location from where soil & wastewater samples were collected by the committee on 04/03/2021 is shown below:

The soil samples collected from the dredged drain/trench were analysed for various parameters. From the analysis reports of the soil samples, It is found that the TOC in the soil sample varies from 0.0357 to 0.168 gm/kg. The soil sample (H5) was collected as reference from the ramp used by the unit for movement of tankers near Gumanpura village bridge as the same was not yet dredged and disposed off by the unit. Higher concentrations of almost all measured parameters were found in the sample collected from Location H5 as compared to other soil samples. The unit needs to collect and dispose of the soil from this location to CHWTSDF site.

The analysis result of the sample is provided in **Annexure – 9.**

Photographs at various points based on observation

Old ETP guard pond of UPL Ltd where recollected firefighting stored

The accident was assessed in terms of the damage caused to the environment. Based on the information submitted by the unit about the accident, meteorological data, list of chemicals with quantity lost during accident, analysis of samples and considering the steps taken thereafter, by the unit, the components considered by the committee for calculating damage to the environment are mentioned in the subsequent paragraphs.

The damage caused to the environment is evaluated based on air, water and soil components considering the probable impact, steps taken by the unit to restore the same.

6.1 Meteorological data on 23/02/2021

Actual meteorological data obtained from M/s. DCM Shriram Alkalies Ltd., Jahagdia situated adjacent to the accident site during the period of accident on 23/02/2021, indicates average wind speed is @ 2.77 km/h, predominant wind direction is from N-NE to S-SW, Avg. Temperature 23 ^{0}C., humidity 52.72 % etc.

Although the prevailing predominant wind direction during the two days period i.e. from the 22-23/02/2021, was from West to East, the actual predominant wind direction observed as per the tabular meteorological data for the period during which the fire accident continued i.e. 1:46 hrs to 6:30 Hrs on 23/02/2021 as from N-NE to S-SW direction. Meteorological data on 23/02/2021 is attached in **Annexure - 14.**

6.2 Air Component

The unit has submitted a list of chemicals with quantity lost due to accident on 23/02/2021 early morning hours. The committee has referred to the methodology adopted for calculation of total quantum of chemicals converted using stoichiometry to various components of all the chemicals which were reportedly lost except for Toluene at various stages and ethanol water mixture. Portion of Toluene is considered burnt and remaining emitted as VOCs from the surface of the flowing water. Accordingly, evaluating damage for air components, two factors were considered i.e. complete combustion of chemicals and emission of VOCs due to toluene.

6.2.1 Estimation of amount of Toluene vaporized

The volatile organic compound such as toluene having low water solubility will be volatilized in air. After the accident, severe smell of toluene was felt by the people at and around the site. The volatility of a volatile organic liquid from a surface depends on vapour pressure of compound, wind speed, and the ambient temperature. Since the specific gravity of toluene is less than water, the undissolved toluene will float on the surface of water.

The volatility of a volatile organic liquid from a surface may be estimated by the following method.

Organic compound volatilized (kg/h/m^2) = $0.00116 \times MW \times Px W^{0.625}$ Equation. 1

(Source: Evaporation Rate of volatile liquids, USEPA, 1989)

Where, W = wind speed in ft/min, P = vapor pressure of compound in inch Hg, MW = molecular weight of compound in gram.

Considering a wind speed of 0.5 km/h (27.9 ft/min) near ground surface corresponding to the wind speed of 2.5 km/h at 10 m at the time of accident, vapor pressure of toluene as 28 mm Hg (1.12 inch Hg) at 25 deg C, and molecular weight of toluene = 92 g/mole, equation (1) predicts the rate of toluene volatilization as 0.95 kg/h/m^2, respectively.

Estimation of the total surface area from where volatilization occurred can be obtained by calculating the surface area of drains as under:

1. Total length of GIDC drains carrying fire-fighting water around unit = 700 m, average width 1.0 m, hence surface area = 700 m^2
2. Total length of katchcha drains wherein fire-fighting water flowed = 3900 m of average width 1 m, hence surface area = 3900 m^2.

Thus, total surface area from where toluene can volatilize = 4600 m^2.

Considering toluene volatilization rate of 0.95 kg toluene/h/m^2,

The total mass of toluene volatilized would be 4370 kg/h.

The total time for volatilization is difficult to predict since all the drain surface area does not become occupied at once. The committee has considered 2 hours for estimation of calculating quantum of toluene, which gives amount of toluene volatilized = 8740 kg. Such vapours of hydrocarbon can produce radicals and secondary pollutants in the sunlight which could be potentially hazardous. Thus for combustion calculation remaining quantum of toluene 18260 kg is considered.

- Combustion of chemicals may have led to generation and release of various gaseous pollutants such as sulfur dioxide (SO_2), hydrogen chloride (HCl), oxides of nitrogen (NOx), carbon di-oxide (CO_2) etc from the chemicals lost during the blast and subsequent fire in the unit. The moles of chemical compounds were considered to calculate the mass of gaseous emissions as shown in Table below.

Table 6:Calculation of Gaseous emissions due to combustion of chemicals during the accident

Chemical formula	Quantity Lost	Quantity Considered for calculation, kg	kilo moles	C	N	O	S	Cl	CO_2, kg	SO_2, kg	NO_2, kg	HCl, kg
$C_6H_{12}OS$	8500	8500	64.39	6	0	1	1	0	17000	4121	74	0
$C_6H_{15}N$	112	112	1.60	4	1	1	0	0	282	0	0	0
C_2H_5SH	1000	1000	16.13	2	0	0	1	0	1419	1032	605	0
$C_6H_{13}N$	1302	1302	13.15	6	1	0	0	0	3472	0	0	0
C_7H_8	27000	18260	198.48	7	0	0	0	0	61131.95	0	0	0
$C_{16}H_{24}O_5S$	3666	3666	11.18	16	0	5	1	0	7868	715	0	0
$C_{16}H_24O_5S$	712	712	2.17	16	0	5	1	0	1528	139	4472	0
$C_3H_6ONCl.HCl$	14000	14000	97.22	3	1	1	1	2	12833	6222	4472	7097
$C_3H_6ONCl.HCl$	14000	14000	97.22	3	1	1	1	2	12833	6222	0	7097
C_2H_5OH	1500	750	12.10	2	0	1	0	0	1065	0	0	0
Total gaseous emissions in kg									**119431.95**	**18452**	**9623**	**14194**

6.2.2 Estimation of Environmental Damage compensation due to release of gaseous emissions

To estimate the damage compensation due to air pollution, the methodology employed by the Committee constituted in case of Yashashvi Rasayan Pvt. Ltd., Dahej (OA NO. 22 of 2020), was adopted. The damage values per ton of SO_2, NO_X, HCl, and CO_2 were taken as (Rs. in Lakh) 2.1989, 2.1729, 0.2189, and 0.0225 per MT of gas, respectively. No such damage value for the release of toluene is available to the best of Committee's knowledge. Therefore, considering the risk of production of secondary pollutants in air due to toluene vapour, a damage value of Rs. 2.1989 lakh per MT of toluene vapor (maximum value among SO_2, NOX, HCl, and CO_2) is taken as damage value of toluene. Based on these Damage values, the total damage cost due to air pollution caused by fire and explosion is estimated as shown in below table.

Table 7:Estimation of Damage value due to Air pollution caused by fire

Air pollutant, MT	SO_2	NOx	HCl	CO_2	Toluene vapor
	18.452	9.623	14.194	119.432	8.74
Damage value, Rs. In Lakh/MT	2.1989	2.1729	0.2189	0.0225	2.1989
Damage value, Rs. In Lakh	40.57	20.91	3.11	2.69	19.22
Total Damage value, Rs. in Lakh : 86.51					

Thus total amount of Rs. 86.51 lacs is calculated for environmental damages for air component.

6.3 Water and Soil Component

The explosion at UPL caused damage to all the compartments of environment emission/discharge of pollutants. Explosion followed by fire led to combustion of other chemicals and intermediates stored in the plant. The water used for fire-fighting contained foam used for fire fighting and the unburnt chemicals which flowed through GIDC drain from the premises to a point near M/s Lanxess followed by the katchcha drain/trench (after M/s Lanxess) and eventually accumulated on open land as the wastewater reportedly did not reach any natural water bodies (Boridra Nallah).

The committee calculated the firefighting water required and subsequent steps taken by the unit to calculate the damage to the environment for the water component.

6.3.1 Damage to Water Environment

Estimation of the amount of water used for fire-fighting

The unit informed that during fire fighting 18 numbers of 1" diameter and 3 numbers 3" diameter nozzle fire hydrants respectively with water pressure in the hydrant maintained at 6-7 kg/cm^2 were used. Considering co-efficient of discharge "Cd" of fire hydrant nozzles varies between 0.7-0.9 depending on the type of nozzle.

The discharge per nozzle can be given as,

$Q=Cd\times(\pi/4)x\ D^2\times\sqrt{(2gH)}$

Where, Q = flow in m^3/sec, D = diameter of nozzle in m, H = water head in m.

Taking value of Cd = 0.8, and water head of 60 m, the flow of water by one 1" (25 mm) and one 3" (75 mm) water hydrant nozzles will be 0.0134 m^3/s (48.24 m^3/h) and 0.121 m^3/s (435.6 m^3/h), respectively. Thus, calculatedly the total water discharged from all the fire hydrants (18 nos. of 1" and 3 nos. of 3" diameter) will be approximately 2175 m^3/h.

Considering 6 hours of operation of fire hydrants total amount of water used for fire fighting will be: ~13000 KL (As per the information provided by the unit, the fire hydrants were operated for 6 hours)

GIDC drainage network are blocked for all seasons except monsoon and to monitor the same CCTV camera focused at the drain near M/s Lanxess India Pvt. Ltd. was provided. GIDC has concrete drainage network from the unit till the exit point of the GIDC drain after crossing M/s Lanxess India Pvt. Ltd. The GIDC drain is subsequently meeting an open kachcha drain/trench leading to Gumanpura village area. The committee has obtained CCTV Footage from the M/s Lanxess India Pvt. Ltd.and the time duration when the dry drainage network of GIDC Jhagadia near M/s Lanxess India Pvt. Ltd. has recorded flow, was considered by the committee.

Snapshots from the CCTV footage are shown as under.

02/23/2021 Tue 05:51:43

02/23/2021 Tue 07:14:56

Wastewater reached @ GIDC SWD near laxness

02/23/2021 Tue 08:03:58

02/23/2021 Tue 09:00:32

02/23/2021 Tue 11:00:59

02/23/2021 Tue 13:30:07

02/23/2021 Tue 14:29:45

02/23/2021 Tue 15:18:12
Wastewater stopped @ GIDC SWD near laxness

- It may be seen that the flow started in the GIDC storm water drain at 6 AM (~4 hours after the accident) and continued until 3 PM. The GPCB officers at the time of visit observed that the average flow velocity in the drain was 0.75 – 1.5 m/s and depth of flow 0.2 – 0.4 m. Taking the average width of cross section of water flow as 1 m, and considering average values of water depth and flow velocity, the total quantity of water flowing in the storm water drain would be approx. 10000 KL. As per report prepared by GPCB on 23/02/2021, wherein it is mentioned that the contaminated wastewater from the unit was found flowing downstream to a location in the Gumanpura village but did not reached to Natural Drain Boridra nalla.

- Based on instructions of GPCB, the unit later on, blocked the drain and started lifting fire-fighting water from the drain near Gumarnpura village on 23/02/2021. The unit reported that about 3000 KL water was lifted from UPL drains and GIDC drain and stored in the Guard pond within the unit. The water lifting work was reportedly completed on 24/02/2021. Thereafter the unit has started dredging of soil and lifting of soil from the area. The work of soil dredging and lifting was reportedly completed on 25/02/2021. Considering the lifting of 3000 KL runoff water by the unit about 10000 KL of fire-fighting runoff water out of total estimated quantity of 13000 KL, went to the natural drain/trench, further going all the way to Gumanpura village, about 5.7 km away from the unit (as per the Google earth image).

The unit provided a list of chemicals lost during the accident as shown in Table 1. These chemicals are highly flammable and it was assumed that most of these chemicals would have been burnt during the fire. However, runoff of firefighting water sample collected by GPCB on 23/02/2021 and the sample of wastewater from guard pond collected by the joint committee on 04.03.2021 reveals that the wastewater has concentration of organics in terms of COD (1272-1932 mg/L) in addition to various other monitored parameters.

When fire-fighting water containing such chemicals is released in to natural environment, there are following possible fates of such chemicals

(1) The chemical dissolved in fire-fighting water can percolate in the soil causing land pollution and may contaminate groundwater,

(2) A part of volatile chemicals (such as toluene which is less soluble) volatilized in air and cause air pollution, and

Considering lifting of firefighting water from natural trench and subsequently dredging of wet soil from the drain/trench and disposal of contaminated soil to CHWTSDF site (about 19 MT wet soil) by the unit, monitoring results of soil samples collected from the drain/trench on 04/03/2021, the committee is in view that the unit has taken possible steps however environmental damage due to spillage of contaminated runoff water cannot be ruled out.

The damage caused and the level of impact due to organic pollutant released is evaluated in monetary terms by the committee by considering two factors

- the waste of natural resources i.e. fresh water used for fighting and cost of treatment of the wastewater generated as per the prevailing treatment cost as charged by the common effluent treatment plants (CETPs) and
- liability towards the environmental damage due to spillage of contaminated runoff water.

The total compensation towards environmental damage due to the discharge of fire-fighting water contaminated with hazardous chemicals (approx. quantity 10000 kL, COD 1272-1932 mg/L) is calculated in below table.

Table 8:Calculation of Environmental Damage

Valuation of environmental damages due to release of organic load in the wastewater	=	Rate of freshwater in the Jhagadia GIDC	+	Treatment cost of the contaminated wastewater generated from fire fighting	+	Liability and Remediation Cost in case of a Fire accident leading to spillage of hazardous waste/ contaminated runoff water*
		Rs. 40 per kl x 13000 kl = Rs.5.2 lac (Rs. 40 per kl GIDC water supply charge)	+	Rs.80 per kl x 10,000 kl = Rs.8 lac (Rs. 80 per kl CETP treatment charge for COD concentration of 2000 mg/l)	+	Rs. 120 lakh

**According to the CPCB "Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Waste and Penalty".*

- **Thus, Total amount of Rs. 133.2 lacs calculated for environmental damages of water and soil component.**

- ***The total cost of Environmental damage compensation due the accident at UPL sums up to Rs. 133.20 lakh (due to the discharge of contaminated fire-fighting water and soil) + Rs. 86.51 lakh (due to the air pollutant) = Rs. 219.71 lakh.***

7 COMPENSATION TO DECEASED PERSONNEL

The compensation amount for the personnel who lost their lives due to the unfortunate fire accident on the intervening night of 22nd February and 23rd February 2021, three court cases i.e. "*Sarla Verma & Ors. Vs. Delhi Transport Corporation & Anr.*", *"Sunita Tokas Vs. New India Insurance Co. Ltd."* and "*Amrit Bhanu Shali & Ors. Vs. National Insurance Co. Ltd. & Ors*." to base the calculation for the payment of compensation considering the following components-

1. Monthly salary of the deceased i.e. gross salary of deceased personnel as per the list provided by the unit.

2. Addition to income for future prospect: The committee has considered following criteria referring to the judgement order of *Sarla Verma &Ors Vs. Delhi Transport Corporation &Anr.*, para 11, *"In view of imponderables and uncertainties, we are in favour of adopting as a rule of thumb, an addition of 50% of actual salary to the actual salary income of the deceased towards future prospects, where the deceased had a permanent job and was below 40 years. [Where the annual income is in the taxable range, the words 'actual salary' should be read as 'actual salary less tax']. The addition should be only 30% if the age of the deceased was 40 to 50 years. There should be no addition, where the age of deceased is more than 50 years".*

3. Deduction for personal and living expense: The committee has considered following criteria referring the judgement order of *Sarla Verma &Ors Vs. Delhi Transport Corporation &Anr.*, Para 14, "*Having considered several subsequent decisions of this court, we are of the view that where the deceased was married, the deduction towards personal and living expenses of the deceased, should be one-third (1/3rd) where the number of dependent family members is 2 to 3, one-fourth (1/4 th) where the number of dependant family members is 4 to 6, and one-fifth (1/5 th) where the number of dependant family members exceed six" and "Where the deceased was a bachelor and the claimants are the parents, the deduction follows a different principle. In regard to bachelors, normally, 50% is deducted as personal and living expenses, because it is assumed that a bachelor would tend to spend more on himself*",

4. Multiplier: The committee has considered following criteria referring the judgement order of *Sarla Verma &Ors Vs. Delhi Transport Corporation &Anr.*, para 21*, " We therefore hold that the multiplier to be used should be as mentioned in column (4) of the Table above (prepared by applying Susamma Thomas, Trilok Chandra and Charlie), which starts with an operative multiplier of 18 (for the age groups of 15 to 20 and 21 to 25 years), reduced by one unit for every five years, that is M-17 for 26 to 30 years, M-16 for 31 to 35 years, M-15 for 36 to 40 years, M-14 for 41 to*

45 years, and M-13 for 46 to 50 years, then reduced by two units for every five years, that is, M-11 for 51 to 55 years, M-9 for 56 to 60 years, M-7 for 61 to 65 years and M-5 for 66 to 70 years"

5. Expense towards love & affection

The committee has referred three cases i.e. "Sarla Verma & Ors. Vs Delhi Transport Corporation & Anr", "*Sunita Tokas Vs. New India Insurance Co. Ltd"* and "*Amrit Bhanu Shali & Ors Vs. National Insurance Co. Ltd. &Ors*."

in which the court has taken different view on different cases depending upon the subjective merit of the case for expense towards love & affection.

Table 9: The amount of expense towards love and affection in the above-mentioned cases

Case	Expense towards love & affection
Sarla Verma & Ors. Vs Delhi Transport Corporation & Anr	Rs. 10,000/- (as loss of consortium)
Sunita Tokas Vs. New India Insurance Co. Ltd	Rs. 2,00,000/-
Amrit Bhanu Shali & Ors Vs. National Insurance Co. Ltd. &Ors	Rs. 1,00,000/- (Rs. 50,000/- to each dependent)

The committee is of the opinion to consider the expenses towards love and affection is 200000/- per case.

6. Expense towards last rites- The committee has referred following three cases as tabulated below and considered Rs. 50,000/- as amount of expense towards last rites.

Case	Expense towards last rites
Sarla Verma & Ors. Vs Delhi Transport Corporation & Anr	Rs. 5,000/-
Sunita Tokas Vs. New India Insurance Co. Ltd	Rs. 50,000/- (Loss of estate & funeral expense)
Amrit Bhanu Shali & Ors Vs. National Insurance Co. Ltd. &Ors	Rs. 10,000/-

Considering the above methodology the committee calculated the amount for deceased personnel and provided as **Annexure – 15.** The unit has submitted details about the compensation paid to the diseased personnel to the SDM Office.

Table 10:A comparative table of total compensation assessed by the committee and amount already paid by the unit is shown in table below:

S. N.	Name	Compensation estimated by the committee	TOTAL COMPENSATION ALREADY PAID BY THE UNIT				
			EX-Gratia	GPA	Term Insurance	Workmen Compensation	Total Amount
1	Late Ketankumar Gevariya	61,48,342.90	3549000	1500000	1000000	0	60,49,000.00
2	Late Vanrajsinh Dodiya	47,31,523.00	3000000	1500000	1000000	0	55,00,000.00
3	Late Krunal Patel	36,34,360.00	3000000	900000	1000000	0	49,00,000.00
4	Lt Nehal Mehta	38,32,630.00	3000000	1300000	1000000	0	53,00,000.00
5	Late Kuvarlal Kasdekar	16,16,794.00	1500000	0	0	954101	24,54,101.00
6	Late Kamal Panse	16,16,794.00	1500000	0	0	932986	24,32,986.00
7	Late Maniram Dhikare	16,16,794.00	1500000	0	0	938634	24,38,634.00

The unit paid total Rs. 2,90,74,721.00/- and has informed that in addition to the above Gratuity, EDLI and PF are also paid as per rules. Therefore, the committee is of the opinion that the unit has already paid compensation under various heads which is more than the compensation calculated by the committee referring the methodology as per orders of various matters of Hon'ble Supreme court of India and Hon'ble NGT except for Late Ketan Kumar Garviya. Therefore, the difference of the amount of Rs. 99342.00/- may be considered by Hon'ble Tribunal as additional compensation to be paid by the unit to the dependent of Late Ketan Kumar Gurviya.

Detailed Information regarding compensation paid by unit to Injured persons are enclosed in **Annexure- 15**.

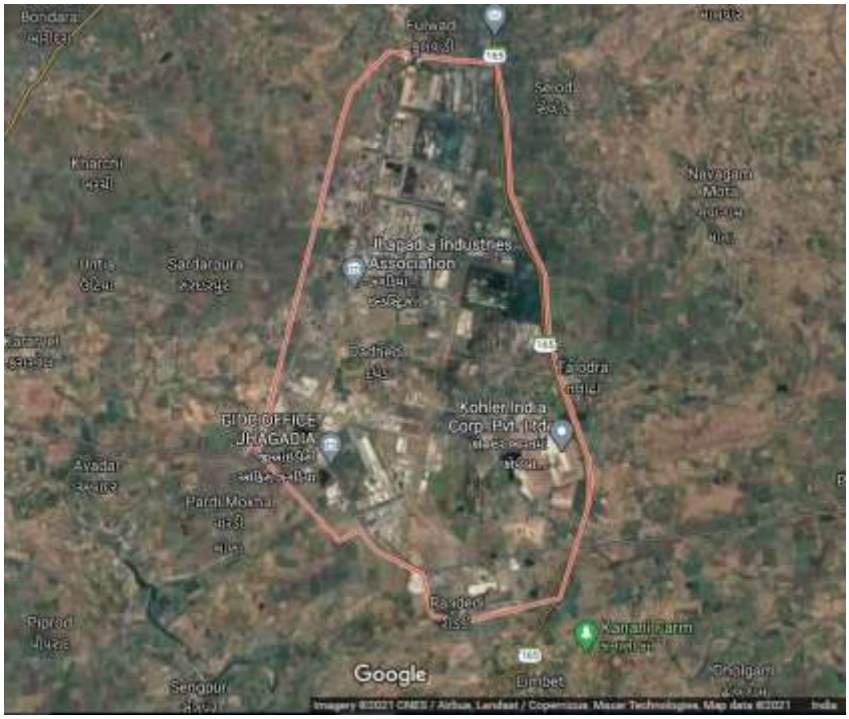
8 CARRYING CAPACITY OF JHAGADIA GIDC

The committee has collected information about existence of various infrastructure facilities in GIDC Jhagadia with respect to number and types of industries, environment management facility, status of onsite and offsite plans in terms of 1989 Rules and mock drills, fire fighting facility, health care facility in the GIDC, details about the list of hazardous chemical storage permission to MAH units in the estate etc. to assess the present capacity in terms of safety of the area.

8.1 About Jhagadia Industrial Estate

Jhagadia Industrial Estate is situated in the golden corridor of south Gujarat is developed by Gujarat Industrial Development Corporation (GIDC) in 1993 at Jhagadia, Taluka Jhagadia, Dist. Bharuch. It is one of the largest agglomerations of industrial units and classified as Mega Industrial Estate is spread over an area of 1700 hectares of land divided into 285 plots. As per records of GIDC, out of total spread area about 1300 hectares are allotted. There are a total 285 plots in GIDC, out of which 275 plots are allotted and 10 plots are not allotted. Out of 275 allotted plots, status of 36 plots is under construction, 100 are open plots. The estate is located @ 16 km in north-east direction from Ankleshwar Industrial Area.

Google Image of GIDC Jhagadia is given below:

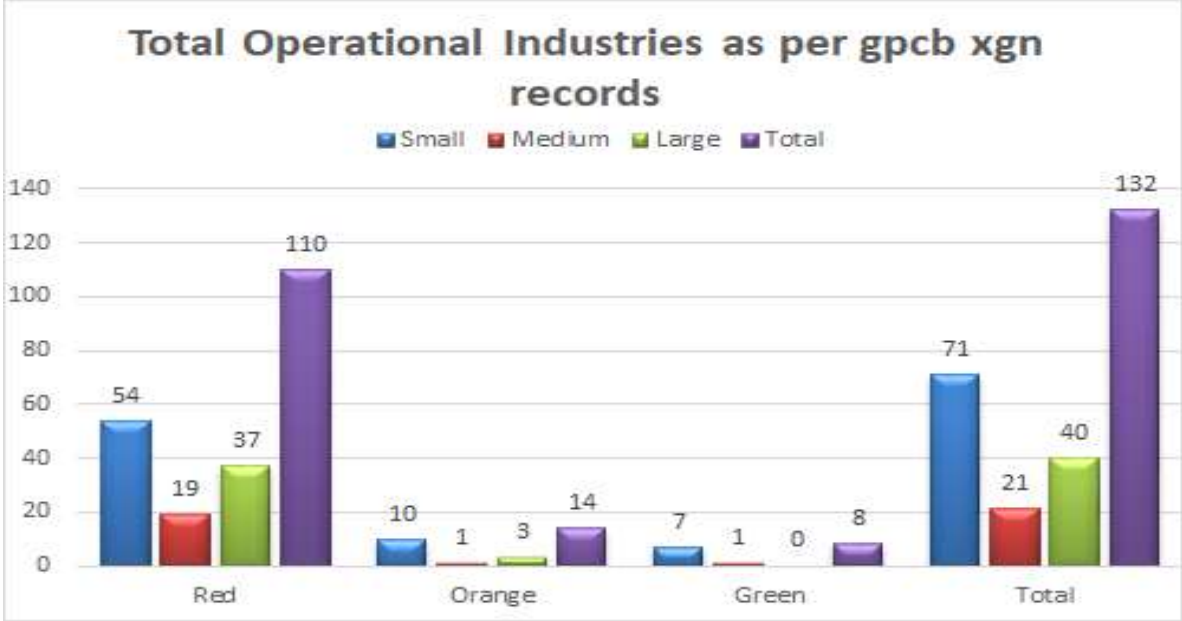


Google Image of Jhagadia Industrial Estate (GIDC, Jhagadia)

As per GPCB record, statistics of operational industries-category and scale wise and operational units are given below Table &graphs

Table 11: Statistics of total operational industries-category and scale wise

Scale → Category	Small	Medium	Large	Total
Red	54	19	37	110
Orange	10	1	3	14
Green	7	1	0	8
Total	**71**	**21**	**40**	**132**



Graphs showing Operational industrial statistics in Jhagadia Industrial Estate (Source: GPCB xgn).

8.2 Details of Present Infrastructure:

8.2.1 Environmental Infrastructure

Wastewater management

Individual industries located at Jhagadia Industrial estates discharges treated wastewater into GIDC drainage network form where it is collected in collection sump at Jhagadia from where it is transferred to Booster Pumping Station at Kantiajal. Booster Pumping Station at Kantiajal also receives wastewater from Final Effluent Treatment Plant (FETP) at Ankleshwar which receives

industrial effluent from Ankleshwar and Panoli Industrial estates. Further, mixed effluent (Jhagadia, Anklehwar & Panoli) from collection Sump at Kantiajal, discharge to deep sea through marine outfall.

Air quality monitoring system (NAMP station, CAAQMS)

- One NAMP station is operated by GPCB for collection of ambient air sampling as per the CPCB guidelines. The station is located at the terrace of Jhagadia Industrial Association (JIA) office in GIDC Jhagadia.
- CAAQMS facility is presently not available.

8.3 Carrying Capacity

Carrying capacity in terms of safety provisions is assessed by the committee by collecting information about the availability and working of onsite and offsite emergency plan, mock drill, safety SOPs, availability of firefighting facility, health care facility in the GIDC, status of Major Accident Hazard (MAH) units in the GIDC Jhagadia etc.

Considering the definition of Major Accident and Major accidents Hazards installation, 11installation in the GIDC Jhagadia are classified as MAH Installation. Definition of Major accident and Major Accident Hazardous Installation is given below.

“Major Accident” means an accident involving loss of life inside or outside the site or ten or more injuries inside and/or one or more injuries outside or release of toxic chemical or explosion or fire of spillage of hazardous chemical resulting in ‘on-site’ or ‘off-site’ emergencies or damage to equipments leading to stoppage of process or adverse effects to the environment.

Definition of Major Accident Hazard (MAH) installation

"Major Accident Hazard (MAH) installation” means isolated storage and industrial activity at a site handling (including transport through carrier or pipeline) of hazardous chemicals equal to, or in excess of the threshold quantities specified in COLUMN 3 OF SCHEDULE 2 and SCHEDULE 3 respectively.
List of MAH Installation in the GIDC Jhagadia is given in table below:

Table 12 : List of MAH Installation in the GIDC Jhagadia

SN	FACTORY NAME	ADDRESS
1	Air Liquid India Holding Pvt Ltd.	Plotno.38/1,GIDC, Jhgadia Dist-Bharuch.
2	Cheme Organic Chemicals.	Plot No. 758,GIDC Estate, Jhagadia,Bharuch.
3	Galaxy Surfactants Ltd.	892,GIDC Jhagadia, Dist-Bharuch.
4	J M Hubar India Pvt Ltd	754 Jhagadia Indl. Estate,GIDC Bharuch 393 110.

SN	FACTORY NAME	ADDRESS
5	Klg Organic Ltd.	Plot No.759, GIDC, Jhagadia, Dist. Bharuch.
6	Lanxess India Pvt Ltd	748/2/A,748/3,748/4/A & B GIDC Jhagadia, Dist-Bharuch
7	Panoli Intermediate (India) Pvt. Ltd.	Plot No. 778/1, GIDC, Jhagadia,Bharuch-393 110
8	Saint Gobain Glass India Ltd	36, GIDC Jhagadia , Dist-Bharuch
9	Shriram Alkali & Chemicals (A Unit Of Dcm Shriram Consolidated) Ltd	749 GIDC Indl. Estate, Jhagadia, Bharuch-393 110
10	Upl Ltd (Unit-5).	750 GIDC Indl. Estate, Jhagadia, Bharuch-393 110
11	Vardhman Acrylics Ltd.	755 GIDC Mega Estate, Jhaghadia, Dist. Bharuch

Detailed information about the list of hazardous chemicals with maximum storage quantity and availability of fire tenders with MAH unit wise is provided in **Annexure – 16**.

Working of Offsite, Onsite emergency plan and Mock drill

As informed by DISH,

- District offsite plan is prepared for Bharuch District wherein GIDC Jhagadia is part of the plan. Offsite mock drill is one of the mandatory requirements to ascertain the working of the offsite plan as per MSIHC Rule under the chairmanship of Dist. Collector. Offsite mock drill was carried out at Jhagadia GIDC on 10/07/2020 at M/s DCM Jhagadia. The Mock drill was planned and carried out for fire in a hydrogen bank truck. Major aim of mock drills is to record the response time and steps to be taken to minimise the same.

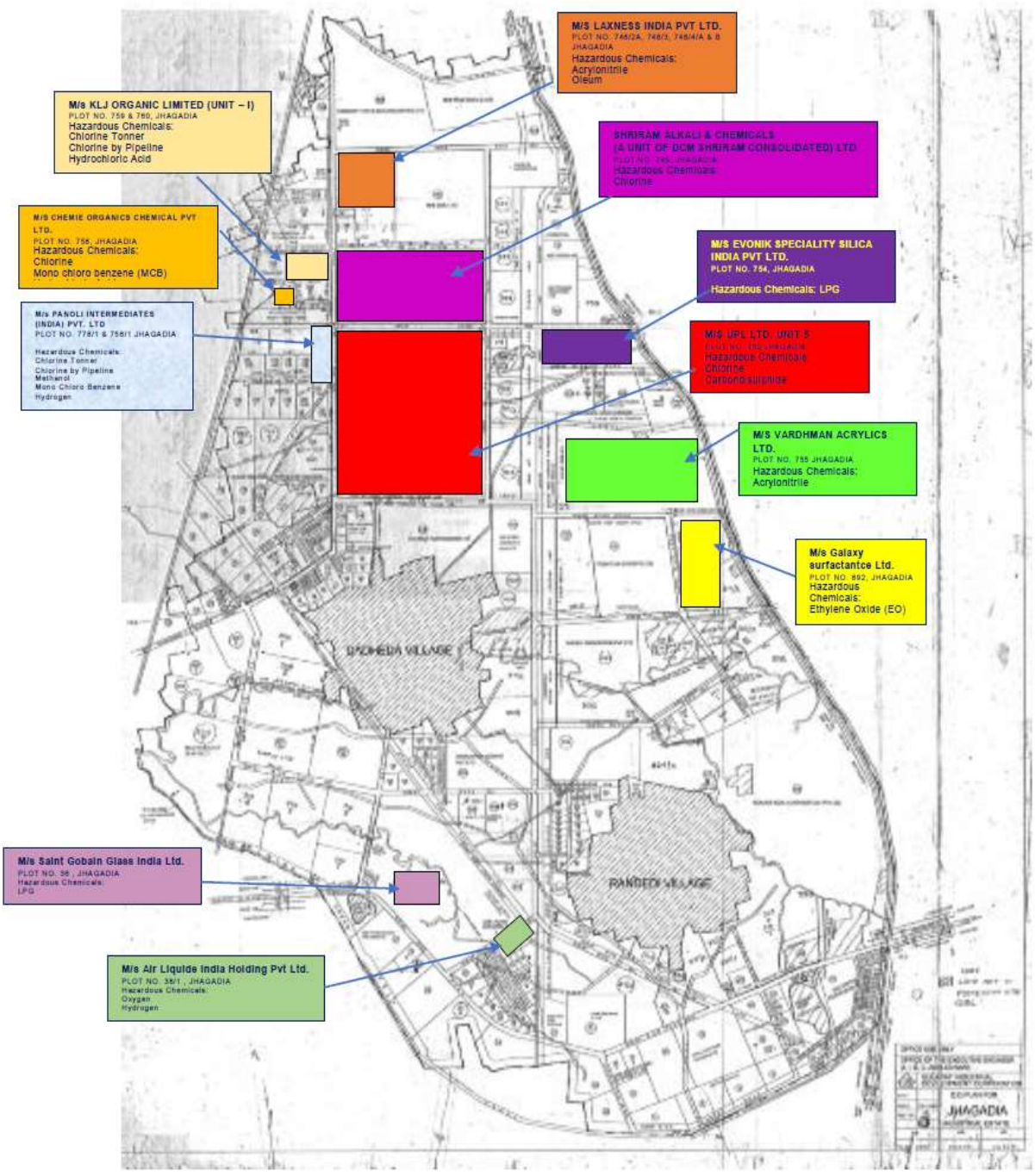
- As per the District Off-Site plan, Jhagadia GIDC has Local Crisis Group comprising 14 members (representative from MAH units and other units).

- DISH informed that all MAH units have onsite emergency plans and a third party safety audit is also carried out and submitted to DISH by all MAH units in the GIDC. As per the statutory requirement, MAH units has to carry out in house mock drills twice in a year and mock drill reports are to be submitted to DISH. All MAH units regularly submitted mock drill reports to DISH.

8.4 Present Capacity of GIDC in terms of safety infrastructure

Jhagadia GIDC Estate is growing with lots of new vulnerability of Risk, having more than one hundred thirty active industries spread in almost 1720 hectares of the land. The GIDC is surrounded by villages having almost 50,000 populations in the vicinity of about 10 kms radius. There are total 11 MAH units in the Jhagadia GIDC.

The location of MAH is marked in the GIDC Jhagadia Map and shown below;



It can be seen that 09 MAH units located in close vicinity and accident in one unit likely to have adverse impact on surroundings and neighbouring units. The MAH units are mutually support each other during any accident in the area. There are only Five MAH units having Fire Tender vehicles with trained fire crew. At present, the available firefighting and allied facilities of the GIDC estate is not adequate even the local fire station of Jhagadia GIDC is also not well equipped and has only one fire tender. The scenario of accident of UPL indicates that the present infrastructure is not enough to handle such types of accident involving fire and explosion. As during the firefighting operation of almost 18 fire tenders from nearby industries of Jhagadia GIDC, from DPMC, Ankleshwar, DPMC-Dahej, GNFC-Bharuch were mobilised in addition to the in-house firefighting capability of the unit.

During the accident at UPL, the injured personnel were given first aid at the health centre of the unit and ambulances were mobilised for taking injured personnel to hospitals Smt. Jayaben Modi Hospital, Ankleshwar, as the area do not have any such facility. The available facilities are in Bharuch and Ankleshwar areas which are almost 25-30 kms away from Jhagadia GIDC estate.

Looking at the above facts, the committee is in the opinion that a review of fire load of individual industries and firefighting facility provided may need to be carried out by concerned authority considering IS13039:2014 and such standards provisions and also to establish a Disaster Prevention and Mitigation Centre (DPMC) type of infrastructure with well-equipped control room with all necessary fire & safety equipment and having trained firefighting staff, rescue workers and first-aiders personnel, deployed round the clock in Jhagadia GIDC, equipped with at least Four Water-cum-foam fire tenders and two HAZMAT vehicles to combat Chlorine and other toxic gas release. In addition to the above, a common water reservoir of adequate capacity with an advanced pumping system in the area may also be planned. Health care facility is also required to be planned as presently the area is not having any such facility to provide even the primary treatment in case of such accident.

9 CONCLUSION

Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi took up the matter on suo-motu basis in the application no. 60/2021 on 25/02/2021, and constituted a joint committee vide orders dated 25/02/2021 to submit a report on the accident that took place in M/s UPL Ltd. (Unit 5), GIDC Jhagadia on 23.02.2021. The accident took place in the manufacturing plant of the final product namely, Clethodim which is herbicide, in CM-257 plant at M/s UPL Ltd. (Unit 5), GIDC Jhagadia. The blast followed by massive fire in the premises of the unit took place on 23/02/2021 in the reactor (stage I, CM-257 Plant). During the accident, the plant process was under shutdown since 04/02/2021 owing to boiler maintenance and inspection. However, materials at intermediate reaction stages were stored in the different reactors of the plant. The reactor in which the blast took place was having about 8.0 MT of Ethyl Thio Butanol (ETB) which is the first stage intermediate product in the process of manufacturing Clethodim. The blast was so massive that it felt like an

earthquake in the entire area resulting into death of 07 personnel working in the plant, injury to 53 personnel within the premises, damage of other reactors/tank form containing various chemicals, other infrastructure including the DCS building, sheds of other plants, glass of windows inside the premises of the unit etc.

The joint committee visited the unit on 04/03/2021 and again on 09/03/2021. During visit, the committee interacted with some of the concerned officials present on duty on the day of accident in the unit, representatives of the unit, collected various available reports and records from the unit. Referring to the reports prepared by DISH, GPCB and other authorities, action taken by different authorities, information collected & observations in connection with accident following conclusions were drawn by the committee:

- The plant CM-257 was commissioned by the unit based on its in-house R&D Study, basic and detailed engineering. During such in-house development of products, more focus need to be given in conducting proper safety and stability test at various stages. However, in the plant stage serious lapses in HAZOP study, safety audit, non-availability of SOP for safe shutdown etc. were observed. The unit has not yet been able to identify the root cause of the accident. One of the probable reasons reported by the unit is leakage of methanol in the reactor containing ETB which might have triggered due to exothermic reaction and resulted in the blast. The reaction of methanol with ETB may be logical in terms of reaction chemistry. However, serious lapses in terms of safety study, reactivity study, compatibility test, development of standard operating procedure for planned and emergency shutdown, storing intermediate stage product during shutdown, gaps in HAZOP, safety audit, in adequacy of sensors provided for the reactor etc. might have resulted in the accident.

- Considering the accident as reported in the social media, during manufacturing of similar product in China in 2019 and in the present case, the committee is ~~in~~ of the opinion that detailed various studies w.r.t. the safety aspects as mentioned in the para above, needs to be carried out before reconsidering manufacturing of Clethodim, as there is a lack of information about thermal stability, reactivity at intermediate stages, and safety provisions as observed in the present case.

- The unit has submitted safety audit report, as per which, details of chemical stored in the unit, the actual total stored quantity of toluene, n-Hexane and Methanol exceeds 143 kl (storage permission from PESO to the unit). However, the safety audit report does not mention any observation regarding exceedance in stored quantity beyond permission limits of PESO. Moreover, the audit report has various gaps which includes lack of detailed process hazards from CM-257 Plant. Thus, the safety audit carried out by the unit shows gaps and needs to be carried out again by a competent agency, accredited by an Accreditation Board as per Rule 68 j para 9 of the Gujarat Factory Rules, 1963 and restrict the storage of chemicals as per permission from PESO.

- The committee is also of the opinion that the unit needs to review entire safety aspects in terms of SOP, HAZOP study, Qualitative and Quantitative Risk assessment, fire load, etc. as gaps were identified during visits. The unit needs to take required measures to fulfil the gaps identified in the report.

- The committee has calculated Environmental Damage cost considering the air, water and soil component. The chemical lost during the accident were converted in terms of pollutants like sulphur-di-oxide, carbon-di-oxide, HCl etc. except a part of toluene considered to be emitted as VOC along with firefighting water. The quantity of firefighting water used is estimated and based on the concentration of COD, the water component is calculated in lieu of loss of natural resources and treatment cost. In addition, the liability towards damage in the area is also considered due to spread of contaminated water on soil. Considering above, t*he total cost of Environmental damage compensation due the accident sums up to Rs. 219.71 lakh which* may be considered by Hon'ble Tribunal to be paid by the unit towards Environmental Damage compensation.

- The committee calculated compensation for the deceased personnel refereeing various orders of Hon'ble Supreme Court of India and various reports of Hon'ble NGT. The committee is of the opinion that the unit has already paid about 290.74 lakh towards compensation under various heads which is more than the compensation calculated by the committee except for in case of Late Shri Ketan Kumar Garviya. Therefore, the difference of the amount of Rs. 99,342.00/- may be considered by Hon'ble Tribunal as additional compensation to be paid by the unit to the dependent of Late Shri Ketan Kumar Gurviya.

- The committee has also identified inadequacies in present infrastructure to combat the major accident scenario in the Jhagadia GIDC. Though it was informed that onsite emergency plan and mock drill is carried out by all 11 Major Accdient Hazardous (MAH) units in the estate as statutory requirement and local crises group is also there in the GIDC as per offsite plan of Bharuch District, the committee is of the opinion that a safety review in terms of fire load of individual industries and firefighting facility provided by them needs to be carried out by concerned authority in compliance to the IS 13039:2014 and other similar standard provisions.

- There is an urgent need of infrastructure like Disaster Prevention and Mitigation Centre (DPMC) with well-equipped control room, all necessary fire & safety equipment, trained firefighting staff, rescue workers and first-aiders personnel deployed round the clock in Jhagadia GIDC. The proposed DPMC should be equipped with at least Four Water-cum-foam fire tenders and two HAZMAT vehicles to combat Chlorine and other toxic gas release may be provided in the GIDC. In addition to the above, a common water reservoir of adequate capacity with an advanced pumping system in the area may also be planned. Health care facility is also required to be planned in vicinity of the Jhagadia estate, as presently the area is not having any such facility to provide even the primary health treatment.

Annexure - 1: Hon'ble NGT order dated 25/02/2021 (OA No. 60/2021)

Item No. 02 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 60/2021

In re: News item published in The Hindu dated 23.02.2021 titled "Two dead, 5 missing in fire at UPL Plant"

Date of hearing: 25.02.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. Proceedings have been initiated in the present matter on the basis of the media reports dated 23.02.2021 published in 'The Hindu' under the heading "**Two dead, 5 missing in fire at UPL plant**"[1]. It is reported that fire broke out **at 1.35 am** on February 23 at **UPL Ltd (United Phosphorus Ltd)** after a blast and major fire at the company's Jhagadia plant which claimed two lives and injured 26. Five labourers are still missing. The unit was shut since February 5 for a planned annual boiler inspection. The Labour and Employment Department of Gujarat Government issued closure notice to the unit. The unit was directed by the Gujarat Government to pay *ex-gratia* compensation to the next of the kin of the deceased workers. The report also gives version of the company that there was no chemical reaction as the plant was shut. Fire may have been caused due to fire/explosion in the solvent which could have been caused due to electric short circuit.

[1] https://www.thehindubusinessline.com/news/national/fire-breaks-out-at-upls-jhagadia-plant-in-gujarat/article33910072.ece

1

2. Above information gives rise to a substantial question of environment relating to compliance of the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 ("the 1989 Rules") and Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 (The 1996 Rules), which have been framed under the Environment (Protection) Act, 1986 (EP Act), falling in schedule to the NGT Act, 2010. It is thus necessary to determine the above question and if necessary, award relief under Section 15 of the NGT Act to the victims and for restoration of the environment after determining the liability of the persons engaged in such activity as well as role of the statutory regulators in failing to prevent the same. Further question is preventive measures to avoid recurrence of such incidents in future in such activities.

3. Since the report shows that the unit is engaged in manufacture of chemicals attracting Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 ("the 1989 Rules") requiring preparation of onsite and offsite plan and conducting of mock drills and as per law laid down in *M.C Mehta v. UoI & Ors.*[2], principle of 'Absolute Liability' is attracted in such cases to compensate the victims of such accidents as well as to compensate the environment, **it is necessary to ascertain the cause of the incident, the extent of damage caused, the extent of compensation required to be paid for damage to the environment as well as for loss of lives, for the injuries and steps required to be taken for preventing any such occurrence in future on the same pattern as the Tribunal has dealt with such accidents in the recent past**[3].

[2] (1987) 1 SCC 395

[3]

4. While directing issuance of notice to the UPL Ltd., Jhagadia, District Bharuch, Gujarat, Director, Industrial Safety and Health (DISH), Gujarat, State PCB, CPCB, District Magistrate, Bharuch and the MoEF & CC by e-mail, we constitute a four-member joint committee comprising of the CPCB, State PCB, DISH and the District Magistrate, Bharuch to give a report to this Tribunal. The nodal agency for coordination and

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i. Order dated 01.06.2020, relating to incident of gas leak dated 07.05.2020 in **LG Polymers India Pvt. Limited** at Vishakhapatnam, resulting in death of 11 persons and injuries to more than 100, apart from other damage (OA No. 73/2020, In re: Gas Leak at LG Polymers Chemical Plant in RR Venkatapuram Village Visakhapatnam in Andhra Pradesh);

ii. Order dated 03.02.2021, relating to incident dated 03.06.2020 in a chemical factory, **Yashyashvi Rasayan Pvt. Ltd**. at Dahej, District Bharuch, Gujarat resulting in deaths and injuries and other damage (OA No. 85/2020) (Earlier OA 22/2020) (WZ), Aryavart Foundation through its President vs. Yashyashvi Rasayan Pvt. Ltd. & Anr.);

iii. Order dated 06.08.2020, in relation to incident of **oil well blow out on 27.05.2020 at Baghjan in the Tinsukia District of Assam** resulting in deaths, injuries and damage to the environment (OA No. 43/2020(EZ), Bonani Kakkar vs. Oil India Limited & Ors.).

iv. Orders dated 06.07.2020 and 22.12.2020, relating to incident dated 30.06.2020 on account of gas leakage at **Sainor Life Sciences** factory at Parawada in industrial area on the outskirts of Vishakhapatnam (OA No. 106/2020, News item published in the local daily "Economic Times" dated 30.06.2020 titled "Another Gas Leakage at Vizag Factory kills two, critically injures four...");

v. Orders dated 08.07.2020 and 22.12.2020, dealing with the incident dated 01.07.2020 resulting in death of 6 person and injury to 17 due to blast of boiler in **M/s Neyveli Thermal Power Station** (NLCIL), Cuddalore (OA No. 108/2020, News item published in the "Indian Express" dated 01.07.2020 titled "Tamil Nadu Neyveli boiler blast: 6 dead, 17 injured") and;

vi. Orders dated 23.07.2020 and 22.12.2020, in relation to incident of **fire engulfed the chemical plant** of **Visakha Solvents Ltd**, Vizag on 13.07.2020 at Ramky CETP Solvents building in Pharma City resulting in injuries (OA No. 134/2020, News item published on 13.07.2020 in the local daily named "India Today" titled "Massive fire engulf Vizag chemical plant, explosions heard, injuries reported").

vii. Order **dated 18.12.2020**, in relation to incident of **explosion in a plastic recycling factory at Sujapur in Malda on 1.12.2020** resulting in death of six persons, including two minors and serious injuries to four persons (OA No. 272/2020, News item published in the "Times of India" dated 20.11.2020 entitled "Six killed as blast tears through Malda Plastic recycling factory").

viii. Order dated **18.12.2020**, in relation to incident of **methane gas leak in a sugar factory** called Lokenete Bapurao Patil Agro Industries Ltd. in Mohol Taluka of Solapur District, Maharashtra on 21.11.2020 resulting in deaths and injuries and other damage (OA No. 274/2020, News item published in the "Indian Express" dated 23.11.2020 entitled "Maharashtra: Two Killed, eight injured in methane gas leak in sugar factory").

ix. Order dated 08.01.2021, in relation **to Gas Leak in Agro Company** (O.A No. 107/2020, In RE: News item published in the local daily "Indian Express Sunday Express" dated 28.06.2020 titled "Gas Leak in Agro Company Claims life of one")

x. Order dated 18.01.2021, in relation to News item published in Navbharat Times dated 24.12.2020 titled "**Gas leaks in IFFCO Plant**, 2 Officers dead" (O.A No. 04/2020, In re : News item published in Navbharat Times dated 24.12.2020 titled "Gas leaks in IFFCO Plant, 2 Officers dead")

xi. Order dated 11.02.2021, in relation to accident of toxic gas leak in Rourkela Steel Plant in Orissa" (O.A. No. 09/2021, In re: News item published in The Indian Express dated 07.01.2021 titled "Four workers dead due to toxic gas leak in Rourkela Steel Plant")

xii. Order dated 16.02.2021, in relation to accident of Virudhunagar firecracker factory blast (O.A. No. 44/2021, In re: News item published in The News Indian Express dated 12.02.2021 titled "At least 19 dead in Virudhunagar firecracker factory blast, more than 30 injured")

compliance will be the CPCB and the State PCB. The committee may visit the site preferably within next one week and give its report with reference to issues mentioned in para 3 within one month by email at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF. Simultaneously, the report may also be uploaded on the website of the State PCB to enable the concerned stakeholders to access the same and file their response, if any.

5. Except for visit to the site at least once, the Committee will be free to conduct its proceedings online. It will be free to take the assistance from any other expert/organization. The Committee may suitably interact with the stakeholders and, apart from considering the present incident, also consider remedial measures for preventing such incidents in the area or by other establishments even beyond the said area. The Committee may compile information about existence and working of onsite and offsite plans in terms of 1989 Rules and conducting of mock drills and safety SOPs., number of such units in the area and the carrying capacity of the area to sustain the same. Since in the recent past, the Tribunal has dealt with similar issues of industrial accidents resulting in deaths and injuries and Expert Committees in some of such accidents have given reports to this Tribunal, such reports may also be taken into account by the Committee to the extent relevant.

List for further consideration on 30.04.2021.

A copy of this order be forwarded to the CPCB, State PCB, DISH and the District Magistrate, Bharuch by email for compliance.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. Nagin Nanda, EM

February 25, 2021
Original Application No. 60/2021
AB

5

Annexure - 2: Permissions obtained by UPL Ltd (unit-5)

Environmental Clearance from MoEF&CC, New Delhi

F. No. J-11011/80/2015-IA-II(I)
Government of India
Ministry of Environment, Forest and Climate Change
(IA Division)

Indira Paryavaran Bhawan
Jor Bagh Road, N Delhi - 3
Dated: 5th April, 2018

To,

M/s UPL Ltd (Unit-V)
Plot No. 750 & 746, GIDC Jhagadia,
District **Bharuch**-393110 (Gujarat)

Sub: Expansion of agro and other organic chemicals manufacturing unit by M/s UPL Ltd (Unit-V) at plot No.746&750, Jhagadia Industrial Estate, Taluka Jhagadia, District Bharuch (Gujarat) - Environmental Clearance - reg.

Ref: Online proposal no. IA/GJ/IND2/27263/2015 dated 4th January, 2017

Sir,

This has reference to your online proposal No.IA/GJ/IND2/27263/2015 dated 4th January, 2017 along with project documents namely, EIA/EMP Report for the above mentioned project.

2. The Ministry of Environment, Forest and Climate Change has examined the proposal for grant of environmental clearance to the project for expansion of agro and other organic chemicals manufacturing unit by M/s UPL Ltd (Unit-V) in a total plot area of 886286.42 sqm, located at plot No.746 & 750, Jhagadia Industrial Estate, Taluka Jhagadia, District Bharuch (Gujarat).

3. Different products/by-products, existing and the proposed are reported to be as under:-

S. No.	Product	CAS No.	Existing (MTPM)	Proposed (MTPM)	Total (MTPM)	Category
A. Products requiring Environmental Clearance						
1	Mancozeb	8018-01-07	4000	8333.33	11633.33	Pesticide
2	Antracol	12071-83-9		1000	1700	Pesticide
3	Pendimethalin	40487-42-1	400	833.33	1233.33	Pesticide
4	Glufosinate	77182-82-2	550	1250	1700	Pesticide
5	Glyphosate	38641-94-0		NIL	100	Pesticide
6	CS_2 (Carbon Di Sulfide)	000075-15-0	3000	3750	6750	Pesticide Intermediate
7	S Metolachlor	87392-12-9	200	1666.67	1866.67	Pesticide
8	Acephate	30560-19-1	800	1666.67	2466.67	Pesticide
9	Acrolein	107-02-8	NIL	666.67	666.67	Pesticide Intermediates

10	CCITM (Di Methyl Cyaniominodithio Carbonate)	10191-60-3	NIL	167.67	167.67	Pesticide Intermediate
11	Tri Ethyl Phosphite	122-52-1	NIL	1000	1000	Pesticide Intermediates
12	CS_2 based Products					
12.1	Potassium Ethyl Xanthate	140-89-6	NIL	833.33	833.33	Intermediates Chemicals
12.2	Sodium isopropyl Xanthate	140-93-2				
12.3	Potassium isopropyl Xanthate	140-93-1				
12.4	Potassium amyl Xanthate	2720-73-2				
12.5	1,6-Bis (N,N-dibenzylthiocarbamyldithio)hexane (Rubber Chemicals)	151900-44-6				
12.6	1-METHYLAMINO-1-METHYLTHIO-2-NITROETHENE (Pharma Intermediates)	61832-41-5				
13	Clomazone	81777-89-1	NIL	416.67	416.67	Pesticide
14	Mesotrione	104206-82-8	NIL	416.67	416.67	Pesticide
15	Flonicamide (IKI220)	158062-67-0	NIL	166.67	166.67	Pesticide
	H_2S based Products					
16	Di Methyl Sulfoxide (DMSO)	67-68-5	NIL	1250	1250	Chemical Intermediates
17	156 TPD caustic Chlorine Plant					
	1) caustic soda lye 48% (on 100 % basis)	1310-73-2	15180	NIL	15180	Chlor Alkali Industry
	2) Chlorine Gas	7782-50-5	12509	NIL	12509	
	3) Hydrogen Gas	1333-74-0	488	NIL	488	
	4) Hydrochloric Acid 30%	7647-01-0	3825	NIL	3825	
18	Power plant		87.5 MW / HR	NIL	87.5MW/Hrs	1(d) Power Plant
	(Electrical Power)	NA				
19	Phenyl Di IsoDecylPhosphite OR	25550-98-5	100	NIL	100	Chemical Intermediates
	Tri DecylPhosphite (TDP) OR	2929-86-4				
	Tris Tri IsoDecylPhosphite (TTDP)	77745-66-5				
20	Di Phenyl Methyl Phosphonate OR	7526-26-3	200 OR	NIL	200 OR	Chemical Intermediates
	Tri Phenyl Phosphate (TPPA) OR	115-86-6	200 OR		200 OR	
	Bisphenol Di Phosphate (BDP)	181028-79-5	50		50	

21	Fosthiazate (IKI 1145)	98886-44-3	250	NIL	250	Pesticide
22	Dichloro Vinyl Acid Chloride (DVACL)	52314-67-7	300	NIL	300	Pesticide Intermediate
23	N Alkylated XyledeneOR	1330-20-7	300	NIL	300	Pesticide Intermediate
	HRT Ketone OR	108-10-1	200		200	
	2 Ethyl 6 Methyl N NANILineOR	24549-06-2	300		300	
	Meta Phenoxy Benzyl Alcohol (MPBAL)	13826-35-2	*300*		*300*	
24	Tebuconazole	107534-96-3	200	NIL	200	Pesticide
25	Acifluorfen	50594-66-6	500	NIL	500	Pesticide
26	Cypermethrin	52315-07-8	500	NIL	500	Pesticide
27	Permethrin	52645-53-1	300	NIL	300	Pesticide
28	Tri Phenyl Phosphite	101-02-0	300	NIL	300	Chemical Intermediates
Total			43902	23418.68	67319.68	
B. Products not requiring Environmental Clearance						
29	NaHS (40%) Solution	1310-73-2	NIL	2500	2500	Specialty Chemicals
30	Na2S solution	1313-82-2	NIL	2500	2500	Specialty Chemicals
31	Na2S Solid	1313-82-2	NIL	2500	2500	Specialty Chemicals
32	Liquid Formulation Products (Pendimethalin, Glufosinate, S Metolachlor, Clomazone, Mesotrione, Acifluorfen, Cypermethrin, Permethrin)		NIL	4166.67	4166.67	Pesticide Formulation products
33	Solid Pesticide Formulation products (Mancozeb, Antracol, Glyphosate, Acephate, Flonicamide, Fosthiazate, Tebuconazole)		NIL	7083.33	7083.33	Pesticide Formulation products
34	PCL_3 Plant		2550	NIL	2550	Specialty Chemicals
	(Phosphorous Tri Chloride)	7719-12-2				
35	Phosphorous	7723-14-0	900	NIL	900	Specialty Chemicals
36	Phosphorus Acid	13598-36-2	150	NIL	150	Specialty Chemicals
	Tri butyl phosphate (TBPO)	126-73-8				
	Tri Iso butyl Phosphite (TIBP)	126-71-7				
37	Phosphorous Penta Chloride (PCl_5)	10026-13-8	200	NIL	200	Specialty Chemicals
38	Phosphorous Oxychloride (POCl3) OR	10025-87-3	250 OR	NIL	250 OR	Specialty Chemicals

	Phosphorous Thiochloride (PSCl3)	3982-91-0	200		200	
39	**Pesticide Formulation Products**					Pesticide Formulation
	Iso Propyl Amine Salt of Glyphosate Formulation		2600	NIL	2600	
	Ammonium Salt of Glyphosate Formulation		2600	NIL	2600	
	Sodium Salt of Aceflorofen Formulation		1500	NIL	1500	
40	MNSO4 (MAGANESE Sulphate) Solution 31%	10124-55-7	10000	NIL	10000	Intermediates Chemicals
Total			**20750**	**18750**	**39500**	

C. By-products

S. No.	By Product	NOC (available) (TPM)	CC&A Available (TPM)	Additional (TPM)	Total (TPM)
1	HCl solution	94.8	2732.02	440	3266.82
2	Dilute Sulphuric Acid	262.5	1655	1250	3167.5
3	Sodium sulphate (Powder) Or	-	4092	9066.75	13158.75
3.a	Sodium Sulphate Solution	-	15680	35895.67	51575.67
4	$Mn(OH)_2$ (manganese Hydroxide)	-	236	492	728.00
5	$Zn(OH)_2$ (Zinc Hydroxide)	-	39	9.75	48.75
6	NaSH solution	-	1876	16418.08	18294.08
7	Magnesium Chloride Solution	-	2070	4702.5	6772.50
8	Ammonium Acetate Or	464	NIL	3926.67	4390.67
8.a	Acetic Acid & Ammonium Sulphate or	-	NIL	4633.33	4633.33
8.b	Ammonium sulphate & Sodium Acetate (30%	-	NIL	5920.00	5920.00
9	Ammonium Chloride (Powder) Or	-	1034.25	3676.5	4710.75
9.a	Anhydrous Ammonia or	-	NIL	415.00	415.00
9.b	20 % AQ Ammonia or	-	NIL	2075.00	2075.00
9.c	$CaCl_2$ SOL or	-	NIL	4800.00	4800.00
9.d	$CaCl_2$ POWDER	-	NIL	1600.00	1600.00
10	METHYL MERCAPTANT	-	NIL	295.83	295.83
11	Sodium Bisulphite SOL	-	NIL	1276.58	1276.58
12	ETHANOL	-	NIL	37.83	37.83
13	Spent Solvent (MDC)	-	NIL	208.33	208.33

14	Sodium Hypochlorite	525	225	NIL	750
15	Ferrous Phosphorous	-	150	NIL	150
16	Calcium Silicate	-	6000	NIL	6000
17	Tri Phenyl Phosphate (TPPA)	-	66.51	NIL	66.51
18	Ammonium Sulphate Solution	-	3600	NIL	3600
19	Ammonium Sulphate Solid	-	750	NIL	750
20	Ethylene Chloride	-	44.5	NIL	44.5
21	Ammonium Hydroxide (20%)	-	116.75	NIL	116.75
22	$POCl_3$	-	400	NIL	400
23	Sodium Sulphite	-	1200	NIL	1200
24	PTSA	-	94	NIL	94
25	Acetic Acid	1185	NIL	NIL	1185
26	Ammonia solution	-	118*	--	118*
27	Ammonium Chloride	-	348*	--	348*
28	Steam	-	60	NIL	60

4. Existing land area is 886286.42 sqm and no additional land will be required for the proposed expansion. Green belt will be developed in an area of 221571.6 sqm. The estimated project cost is Rs.1923.68 crore. Total capital cost earmarked for pollution control measures is Rs.69.4 crore and the recurring cost (O&M) will be about Rs.1.40 Crore per annum.

5. There are no National Parks, Wildlife Sanctuaries, Biosphere, Reserves, Tiger/Elephant Reserves, and Wildlife Corridors etc within 10 km of the project site. Kaveri river is flowing at a distance of 2.97 km in the North.

6. Fresh water requirement will be 10,000 cum/day, proposed to be met from GIDC supply. Treated effluent of 3000 cum/day will be discharged to the conveyance system of M/s Narmada Clean Tech Ltd for disposal to deep sea.

Power requirement after expansion will be increased from 21 MWH to 71 MWH, proposed to be sourced from DGVCL & Captive power plant respectively. Existing unit has five DG sets of 625 kVA, 750 kVA, 1250 kVA, 1000 kVA, 320 kVA capacity. More six DG sets of 1000 kVA each shall be used as standby during power failure. Stack of 20 m height will be provided as per CPCB norms to the proposed DG sets of 1000 KVA.

One new Natural Gas/Coal/Biomass/briquettes fired boiler of 150 TPH will be equipped with bunker bay, ESP and stack of 100 m height to control the particulate emissions. Two stage water scrubbers with 30 m stack height shall be provided for control of process emissions of ammonia, HCL and SO_2 emissions separately.

Spent filter material, spent catalyst will be sent to Common Hazardous Wastes Incineration Facility (CHWIF). Insulation waste, non recyclable plastic waste, used PPE, and incineration ash will be sent to TSDF. Contaminated cotton waste will be sent to TSDF/incineration site.

7. The project/activities are covered under category A of item 5(b) 'Pesticides industry and pesticide specific intermediates (excluding formulation)' of the Schedule to the Environment Impact Assessment Notification, 2006, and requires appraisal at central level by the sectoral EAC in the Ministry.

8. The ToR for the project was granted on 13th July, 2015 followed by amendment therein on 31st August, 2015, providing exemption from public hearing.

9. The proposal was considered by the Expert Appraisal Committee (Industry-2) in its meetings held during 8-9 December, 2016, 27-28 February, 2017, 17-18 April, 2017 and 20-22 December, 2017. The project proponent and their accredited consultant M/s Siddhi Green Excellence Pvt Ltd presented EIA/EMP report as per the ToR. The EAC found the EIA/ EMP report to be satisfactory and in consonance with the presented ToR. The Committee has recommended the proposal for grant of environmental clearance.

10. Based on the proposal submitted by the project proponent and recommendations of the EAC, the Ministry of Environment, Forest and Climate Change hereby accords environmental clearance to project **'Expansion of Agro and other Organic Chemicals'** manufacturing unit by M/s UPL Ltd (Unit-V) in a total plot area of 886286.42 sqm, located at plot No.746&750, Jhagadia Industrial Estate, Taluka Jhagadia, District Bharuch (Gujarat), under the provisions of the EIA Notification, 2006, and the amendments therein, subject to the compliance of the terms and conditions as under:

(a) The project proponent shall take stringent mitigating measures to minimize the incremental concentration of air pollutants (mainly PM_{10} & $PM_{2.5}$) to the extent possible due to the proposed industrial operations.

(b) The project proponent shall develop local air quality management plan in consultation with SPCB and implemented to achieve desired standards.

(c) The incremental ground level concentrations for PM_{10}, $PM_{2.5}$, SO_2 & NO_x due to the increased vehicular and other allied/developmental activities, shall be analysed and reported for actual impact of the project, besides remedial measures.

(d) National Emission Standards for Pesticide Manufacturing and Formulation Industry issued by the Ministry vide G.S.R. 46(E) dated 3rd February, 2006 and amended time to time shall be followed by the unit.

(e) Natural Gas/imported coal with less than 5% sulphur content/Biomass/briquettes shall be used as fuel source for One no. new boiler of 150 TPH. Two stage water scrubbers with 30 m stack height shall be provided for control of process emissions of ammonia, HCl and SO_2 emissions separately.

(f) Two stage water scrubber followed by alkali scrubber shall be provided to process vent to control process emissions viz. HCl, SO_2, Cl_2, NO_x, HBr. Acidic scrubber shall be provided to process vent to control process emissions viz. NH3 & HC. The scrubbed water should be sent to ETP for further treatment. Efficiency of scrubber shall be monitored regularly and maintained properly. Scrubbers vent shall be provided with online detection and alarm system to indicate higher than permissible value of controlled parameters. At no time, the emission levels shall go beyond the prescribed standards. The system should be interlocked with the pollution control equipment so that in case of any increase in pollutants beyond permissible limits, plant should be automatically stopped.

(g) In plant control measures for checking fugitive emissions from all the vulnerable sources shall be provided. Fugitive emissions shall be controlled by providing closed storage, closed handling & conveyance of chemicals/materials, multi cyclone separator and water sprinkling system. Dust suppression system including water sprinkling system shall be provided at loading and unloading areas to control dust emissions. Fugitive emissions in the work zone environment, product, raw materials storage area etc. shall be regularly monitored and records maintained.

(h) For further control of fugitive emissions, following steps shall be followed :

- Closed handling system shall be provided for chemicals.
- Reflux condenser shall be provided over reactor.
- System of leak detection and repair of pump/pipeline based on preventive maintenance.
- The acids shall be taken from storage tanks to reactors through closed pipeline. Storage tanks shall be vented through trap receiver and condenser operated on chilled water.
- Cathodic protection shall be provided to the underground solvent storage tanks.

(i) A proper Leak Detection and Repair (LDAR) Program for pesticide unit shall be prepared and implemented as per CPCB guidelines. Focus shall be given for prevention of fugitive emissions for which preventive maintenance of pumps, valves, pipelines are required. Proper maintenance of mechanical seals of pumps and valves shall be given. A preventive maintenance schedule for each unit shall be prepared and adhered to.

(j) Company shall take all the measures in order to protect the machineries and equipments for pesticide producing unit from ageing.

(k) Continuous monitoring system for chlorine, HCl as well as VOCs shall be installed at all important places/areas. Effective measures shall be taken immediately, when monitoring results indicate above the permissible limits. Alarm for chlorine leakage if any in the liquid chlorine storage area is provided along with automatic start of the scrubbing system.

(l) The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution.

(m) Solvent management shall be carried out as follows:

- Chilled brine circulation system shall be provided to condensate solvent vapors and reduce solvent losses, ensuring that solvent recovery should not be less than 95%.
- Reactor and solvent handling pump shall have mechanical seals to prevent leakages.
- The condensers shall be provided with sufficient HTA and residence time so as to achieve more than 95% recovery
- Solvents shall be stored in a separate space specified with all safety measures.
- Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done. vi. Entire plant shall be flame proof. The solvent storage tanks should be provided with breather valve to prevent losses.

(n) Fresh water demand after the proposed expansion should be limited to 17,000 cum/day to 10,000 cum/day and prior permission should be obtained from the competent authority.

(o) The effluent shall be segregated into cyanide stream and High TDS/COD effluent streams. Cyanide effluent stream will be treated with sodium hypochlorite in alkaline medium. High TDS/COD effluent stream will be passed through steam stripper followed by concentrated

in MEE. MEE condensate will be treated in the ETP. Treated effluent from ETP will be passed through RO. RO permeate will be recycled/reused within plant premises. Domestic sewage should be treated in STP. Water quality of treated effluent should meet the norms prescribed by CPCB/SPCB.

(p) The industry will reduce the effluent quantity from 4,768 KL/Day to 3,000 KL/Day by adopting recycle/reuse. Treated effluent will be discharged to Conveyance System of Narmada Clean Tech and disposed to deep sea.

(q) Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.

(r) Hazardous chemicals shall be stored in tanks in tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm. Solvent transfer shall be by pumps.

(s) The company shall obtain Authorization for collection, storage and disposal of hazardous waste under the Hazardous & Other Wastes (Management & Trans-Boundary Movement) Rules 2016 and amended as on date for management of Hazardous wastes and prior permission from GPCB shall be obtained for disposal of solid / hazardous waste in the TSDF. Measures shall be taken for fire fighting facilities in case of emergency. Membership of TSDF for hazardous waste disposal shall be obtained.

(t) ETP sludge, inorganic waste shall be sent to TSDF site. High calorific value waste such as spent organic shall be sent to cement factory/incinerated.

(u) The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 11989 as amended in October, 1994 and January, 2000. All Transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.

(v) The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire fighting system shall be as per the norms.

(w) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

(x) 10 m wide Green belt of perennial trees like neem, seasam, teak etc should be developed inside along the plant periphery to mitigate the effects of fugitive emissions all around the plant as per the CPCB guidelines in consultation with DFO.

(y) At least 5 % of the total cost of the project shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office at Bhopal. Implementation of such program shall be ensured accordingly in a time bound manner within 5 years.

10.1 The grant of Environmental Clearance is further subject to compliance of other generic conditions as under:-

(i) The project authorities must strictly adhere to the stipulations made by the state Pollution Control Board (SPCB), State Government and/ or any other statutory authority.

(ii) No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry. In case of deviations or alterations in the project proposal from those submitted to this Ministry, a fresh reference shall be made to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.

(iii) The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.

(iv) The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be complied with.

(v) The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).

(vi) The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations within the plant.

(vii) Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

(viii) The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing shall be implemented.

(ix) The company shall undertake all measures for improving socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villagers, administration and other stake holders. Also eco-developmental measures shall be undertaken for overall improvement of the environment.

(x) A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.

(xi) The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.

(xii) A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zila Parishad/ Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.

(xiii) The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.

(xiv) The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional offices of MoEF&CC by e-mail.

(xv) The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at http://moef.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional office of the Ministry.

11. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not found to be satisfactory.

12. The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.

13. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention &. Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991, read with subsequent amendments therein.

5/4/2018

(S. K. Srivastava)
Scientist E

Copy to:-

1. The APCCF, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, **Bhopal**-462016 (MP)
2. The Principal Secretary, Environment Department, Government of Gujarat, Block 14, 8th floor, Sachivalaya,**Gandhinagar**-382 010 (Gujarat)
3. The Member Secretary, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, **New Delhi** - 32
4. The Member Secretary, Gujarat Pollution Control Board, Paryavaran Bhavan, Sector-10A, Gandhinagar-382 010, Gujarat.
5. Monitoring Cell, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, **New Delhi**
6. Guard File/Monitoring File/Record File

5/4/2018

(S. K. Srivastava)
Scientist E

Consent from GPCB

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar**-382 010
Phone : (079) 23226295
Fax : (079) 23232156
Website : www.gpcb.gov.in

By R.P.A.D.

CONSOLIDATED CONSENT AND AUTHORIZATION (CC & A – Amendment)
CCA AMENDMENT NO: AH - 108451

NO: GPCB/ANK/CCA-134(29)/ID-25353/ **DT:____/10/2020**

To,
M/s. UPL LTD. (UNIT-5),
PLOT NO:750, 746,
GIDC ESTATE JHAGADIA,
DIST-BHARUCH.

SUB: Amendment in Consolidated Consent & Authorization (CC&A) under various Environmental Acts/ Rules.

REF: (1) Your application No. 171870 dated 11/03/2020.
(2) CCA No. AWH - 94827 dated :25/10/2018. (CCA Renewal)
(3) CCA Amendment No. AWH -102834 dated:17/10/2019.
(4) CCA Amendment No. AWH -104141 dated:07/12/2019.

Sir,

This has reference to the CCA order No: AWH-94827, issued vide letter no. GPCB/ ANK/ CCA-134(24)/ ID-25353/473660, dated 25/10/2018 and further amended dated 17/10/2019, 07/12/2019 under the provisions of the various Environmental Act/ Rules, which stands amended as under.

The Validity of this order will be up to 19/11/2024.

1. **The list of proposed products to be manufactured shall be as follows:**

Sr. No.	Products Name	Existing Capacity (MT/Month)	Additional Capacity (MT/Month)	Total Capacity (MT/Month)
1	Mancozeb	4000	Nil	4000
	OR	OR	OR	OR
	Antracol	4000	Nil	4000
2	Mancozeb	8333.33	Nil	8333.33
3	Antracol	1000	Nil	1000
4	Pendimethalin	833.33	Nil	833.33
5	Pendimethalin	400	Nil	400
	OR			
	Fipronil			
	OR			
	Buprofezin			
	OR			
	Prothioconazole			
	OR			

Clean Gujarat Green Gujarat

ISO - 9001 - 2008 & ISO - 14001 - 2004 Certified Organisation

	Benoxacor			
6	Glufosinate	550	Nil	550
	OR	OR	OR	OR
	Glyphosate	550	Nil	550
	OR	OR	OR	OR
	Clethodim (CM-257)	Nil	(+)165	165
7	Glufosinate	1250	Nil	1250
8	CS2 (Carbon Disulphide)	5000	Nil	5000
9	S Metolachlor	1866.66	Nil	1866.66
10	Acrolein	666.66	Nil	666.66
11	Triethyl Phosphite (TEP)	1000	Nil	1000
12	156 TPD Caustic Chlorine Plant			
	Caustic Soda Lye 48% (on 100% basis)	4680	Nil	4680
	Chlorine Gas	3972	Nil	3972
	Hydrogen Gas	225	Nil	225
	Hydrochloric Acid (30%)	1200	Nil	1200
13	Power Plant (Electric Power)	87.5 MW/HR	Nil	87.5 MW/HR
14	Phenyl Di Iso Decyl Phosphite	50	Nil	50
	OR			
	Tri Decyl Phosphite (TDP)			
	OR			
	Tris Tri Iso Decyl Phosphite (TTDP)			
15	Di Phenyl Methyl Phosphonate (DPMP)	15	Nil	15
	OR	OR	OR	OR
	Tri Phenyl Phosphate (TPPa)	15	Nil	15
	OR	OR	OR	OR
	Bis Phenol Di Phosphate (BDP)	3.75	Nil	3.75
16	Fosthiazate (IKI-1145)	250	Nil	250
	OR	OR	OR	OR
	Cyproconazole	250	Nil	250
	OR	OR	OR	OR
	Atrazine	250	Nil	250

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	OR	OR	OR	OR
	2,4-D Technical (2,4 Dichloro Phenoxy Acetic Acid)	125	Nil	125
	OR	OR	OR	OR
	Sulphentrazone	125	Nil	125
	OR	OR	OR	OR
	Trifloxystrobin	125	Nil	125
	OR	OR	OR	OR
	Boscalid Technical	125	Nil	125
	OR	OR	OR	OR
	Mesotrion	125	Nil	125
	OR	OR	OR	OR
	Methoxifenozide	125	Nil	125
	OR	OR	OR	OR
	Isoxaflutole	125	Nil	125
	OR	OR	OR	OR
	Dicamba	125	Nil	125
17	Di Chloro Vinyl Acid Chloride (DVACL)	300	Nil	300
	OR	OR	OR	OR
	Acrolein	300	Nil	300
	OR	OR	OR	OR
	Tri Ethyl Phosphite (TEP)	300	Nil	300
	OR	OR	OR	OR
	Dihydroxy Dithiane (DHDT)	300	Nil	300
	OR	OR	OR	OR
	DCPT (2,4 Dichloro – 4,5 Di Hydro – 4 – Difluoromethyl - 3-Methyl – 1 – Phenyl – 1,2,4 Triazol – 5 (1H) – One)	75	Nil	75
18	N- Alkylated Xyledene	300	Nil	300
	OR	OR	OR	OR
	HRT Ketone	200	Nil	200
	OR	OR	OR	OR
	2 Ethyl 6 Methyl N N Aniline	300	Nil	300
	OR	OR	OR	OR
	MPBAL	300	Nil	300

	OR	OR	OR	OR
	UPDT (Saponified Poly Acrylonitrile Starch Graft Polymer)	300	Nil	300
19	Tri Phenyl Phosphite (TPPi)	260	Nil	260
	OR	OR	OR	OR
	Tri Butyl Phosphate (TBPO)	260	Nil	260
	OR	OR	OR	OR
	Tri Iso Butyl Phosphite (TIBP)	260	Nil	260
	OR	OR	OR	OR
	Phosphorous Acid	140	Nil	140
20	NaSH (40% Solution)	2500	Nil	2500
21	Na2S Solution	2500	Nil	2500
22	Na2S Solid	2500	Nil	2500
23	Liquid Formulation Products (Pendimethalin, Glufosinate, S Metolachlor, Clomazone, Mesotrion, Acifluorfen, Cypermethrin, Permethrin)	4166.66	Nil	4166.66
24	Solid Formulation Products (Mancozeb, Antracol, Glyphosate, Acephate, Flonicamide, Fosthiazate, Tebuconazole)	7083.25	Nil	7083.25
25	Phosphorous Trichloride (PCl3)	3050	Nil	3050
26	Phosphorous	300	Nil	300
27	Phosphorous Penta Chloride (PCl5)	375	Nil	375
	OR	OR	OR	OR
	Phosphorous Oxychloride (POCl3)	375	Nil	375
	OR	OR	OR	OR
	Phosphorous Thiochloride (PSCl3)	375	Nil	375
	OR	OR	OR	OR

GPCB

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	Di Phenyl Methyl Phosphonate (DPMP)	375	Nil	375
	OR	OR	OR	OR
	Magnesium Chlorate 40% Solution (Omega)	Nil	(+)130	130
28	Pesticide Formulation Products (Mancozeb, Antracol, Glufosinate, Pendimethalin, S-Metolachlor, Flonicamide (IKI 220), Clomazone, Acephate, Clethodim (CM-257))	6700	Nil	6700
29	Di Methyl PhosphoAmidoThioate (DMPAT)	600	Nil	600
	OR	OR	OR	OR
	Myristyl Amine Oxide (MO)	600	Nil	600
	OR	OR	OR	OR
	DESMP (Phosphonate Di Ethyl P- Toluene Sulfonyloxyl Methyl Phosphonate)	300	Nil	300

2. **SPECIFIC CONDITIONS**:-

a. There shall not increase pollution load due to proposed change in product mix.
b. There shall not be any change in plant building, equipments & machineries to manufacture the proposed new products after change in product mix.
c. Unit shall not carryout any activity / production without prior permission that attracts EIA Notification dated 14/09/2006 amended from time to time.
d. All the efforts shall be made to send hazardous waste to cement industry for Co-processing first & there after it shall be disposed through other option.
e. There shall be no change in water consumption, wastewater generation and their mode of disposal.
f. There shall be no change in fuel consumption, flue gas emission and process gas emission.
g. There shall be no change in Hazardous waste quantity/category. Unit has proposed two different types of waste 1) Methanol alternate: 816 MT/Year (Cat: 29.4) to existing hazardous waste magnesium chloride solution (Cat: B10) 2) Propionic acid: 384 MT/Year (Cat: 29.6) alternate to existing hazardous waste from different categories.

h. Unit shall obtain permission from CPCB / GPCB under rule- 9 of Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016 for utilization of spent of other industry as Raw material.

i. In the case of submission of the false or misleading data, this CCA amendment will be forfeited immediately.

3 All other conditions of CCA order No: **AWH-94827, issued vide letter no. GPCB/ ANK/ CCA-134(24)/ ID-25353/473660, dated 25/10/2018 and further amended dated 17/10/2019, 07/12/2019** will remain same.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(M.P.Solanki)
Dy. ENVIRONMENT ENGINEER

License of PESO

भारत सरकार
Government of India
वाणिज्य और उद्योग मंत्रालय
Ministry of Commerce & Industry
पेट्रोलियम तथा विस्फोटक सुरक्षा संगठन (पैसो)
Petroleum & Explosives Safety Organisation (PESO)
ए-1 और ए-2 विंग, पाँचवा तल, केंद्रीय कार्यालय परिसर, सी.बी.डी. बेलापुर
नवी मुंबई (महा.)- 400614
A1 & A2 wing, 5th Floor, C.G.O. complex, CBD Belapur, Navi Mumbai (M.S.),
Mumbai - 400614

E-mail : jtccemumbai@explosives.gov.in
Phone/Fax No : 022 - 27578946,27573881

संख्या /No. : P/WC/GJ/15/2727 (P445925)

दिनांक /Dated 13/07/2020

सेवा में /To,
M/s. UPL LIMITED, Unit-5,
Plot No. 748 & 750, GIDC Jhagadia, P.B.No.9,
Jhagadia,
Taluka: Jhagadia,
District: BHARUCH,
State: Gujarat
PIN: 393110

विषय /Sub : Plot No, 748 &750, Unit-5,GIDC Estate Jhagadia , Jhagadia, Jhagadia, Taluka: Jhagadia, District: BHARUCH, State: Gujarat, PIN: 393110 में पेट्रोलियम वर्ग A का अधिष्ठापन -अनुज्ञप्ति जारी करने के बारे में ।
Petroleum Class A installation at Plot No, 748 &750, Unit-5,GIDC Estate Jhagadia , Jhagadia, Jhagadia, Taluka: Jhagadia, District: BHARUCH, State: Gujarat, PIN: 393110 Grant of License regarding.

महोदय /Sir (s),

कृपया आपके पत्र क्रमांक OIN507923 दिनांक 01/06/2020 का अवलोकन करें ।
Please refer to your letter No. OIN507923 dated 01/06/2020

विषयान्तर्गत अधिष्ठापन में निम्नलिखित पेट्रोलियम पदार्थों के वर्ग तथा मात्रा के भंडारण के लिए पेट्रोलियम नियम, 2002 के अधीन प्रपत्र - XV में स्वीकृत, दिनांक 31/12/2029 तक वैध अनुज्ञप्ति संख्या P/WC/GJ/15/2727 (P445925) दिनांक 13/07/2020 भेजी जा रही है ।
Licence No. P/WC/GJ/15/2727 (P445925) dated 13/07/2020 granted in Form XV under the Petroleum Rules, 2002 and valid till 31/12/2029 for the storage of the following kinds and quantities of Petroleum at the subject installation is forwarded herewith

पेट्रोलियम का विवरण /Description of Petroleum	किलोलीटरों में अनुज्ञप्त क्षमता /Quantity licenced in KL
वर्ग क प्रपुंज पेट्रोलियम /Petroleum Class A in bulk	143.00 KL
वर्ग क प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class A, otherwise than in bulk	NIL
वर्ग ख प्रपुंज पेट्रोलियम /Petroleum Class B in bulk	NIL
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class B, otherwise than in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम /Petroleum Class C in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class C,otherwise than in bulk	NIL
कुल क्षमता /Total Capacity	143.00 KL

कृपया पेट्रोलियम नियम 2002 के अधीन बनाए गए नियम 148 में दी गई प्रक्रिया का कड़ाई से पालन करें और अनुज्ञप्ति के नवीकरण हेतु समस्त दस्तावेजों को अनुज्ञप्ति की वैधता समाप्ती की तारीख या उससे पूर्व इस कार्यालय को पेषित करें ।
Please follow the procedure strictly as laid down in rule 148 of the Petroleum Rules, 2002 and submit complete documents for further renewal of the licence to this office, so as to reach on or before the date on which licence expires.

यह अनुमोदन/ अनुमति अन्य प्राधिकारियों से आवश्यक अनुमति/क्लीयरन्स प्राप्त करने से या यथा लागू अन्य विधियों से छूट नहीं देती है ।

This approval/permission, however, does not absolve from obtaining necessary permission/clearance from other authorities or under other statutes as applicable

भवदीय /Yours faithfully,

((डा. अनुज कुमार))
(Dr. Anuj Kumar))
विस्फोटक नियंत्रक
Controller of Explosives
कृते संयुक्त मुख्य विस्फोटक नियंत्रक
For Jt. Chief Controller of Explosives
नवी मुंबई (महा.)/Mumbai

Copy forwarded to :-
1. The District Magistrate, BHARUCH(Gujarat) with reference to his NOC No 1 Dated 20/05/2020
2. The Dy. Chief Controller of Explosives, Vadodara. A Copy of the licence along with approved plan is enclosed

For Jt. Chief Controller of Explosives
Mumbai

स्थिति जानने से संबंधित फीस एवं अन्य विवरण हमारी वेबसाइट http://peso.gov.in देखें)
(For more information regarding status,fees and other details please visit our website http://peso.gov.in)

Note:-This is system generated document does not require signature.

प्ररूप XV
(प्रथम अनुसूची का अनुच्छेद 6 देखिए)
FORM XV
(see Article 6 of the First Schedule)

अधिष्ठापनों में पेट्रोलियम के आयात और भंडारकरण के लिए अनुज्ञप्ति
LICENCE TO IMPORT AND STORE PETROLEUM IN AN INSTALLATION

अनुज्ञप्ति सं. (Licence No.) : P/WC/GJ/15/2727(P445925) फीस रूपए (Fee Rs.) 9650/- per year

M/s. UPL LIMITED, Unit-5, Plot No. 746 & 750, GIDC Jhagadia, P.B.No.9, Jhagadia, Taluka: Jhagadia, District: BHARUCH, State: Gujarat, PIN: 393110 को केवल इसमें यथा विनिर्दिष्ट वर्ग और मात्राओं में पेट्रोलियम 143.00 KL आयात करने के लिए और उसका, नीचे वर्णित और अनुमोदित नक्शा संख्या P/WC/GJ/15/2727(P445925) तारीख 13/07/2020 जो कि इससे उपाबद्ध है, में दिखाए गए स्थान पर भण्डारकरण के लिए पेट्रोलियम अधिनियम, 1934 के उपबंधों या उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अतिरिक्त शर्तों के अधीन रहते हुए, यह अनुज्ञप्ति अनुदत्त की जाती है ।

Licence is hereby granted to M/s. UPL LIMITED, Unit-5, Plot No. 746 & 750, GIDC Jhagadia, P.B.No.9, Jhagadia, Taluka: Jhagadia, District: BHARUCH, State: Gujarat, PIN: 393110 valid only for the importation and storage of 143.00 KL Petroleum of the class and quantities as herein specified and storage thereof in the place described below and shown on the approved plan No P/WC/GJ/15/2727 (P445925) dated 13/07/2020 attached hereto subject to the provisions of the Petroleum Act. 1934 and the rule made thereunder and to the further conditions of this Licence.

यह अनुज्ञप्ति 31st day of December 2029 तक प्रवृत रहेगी ।
The Licence shall remain in force till the 31st day of December 2029

पेट्रोलियम का विवरण /Description of Petroleum	अनुज्ञप्त मात्रा (किलोलीटरों में) /Quantity licenced in KL
वर्ग क प्रपुंज पेट्रोलियम /Petroleum Class A in bulk	143.00 KL
वर्ग क प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class A, otherwise than in bulk	NIL
वर्ग ख प्रपुंज पेट्रोलियम /Petroleum Class B in bulk	NIL
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class B, otherwise than in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम /Petroleum Class C in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class C,otherwise than in bulk	NIL
कुल क्षमता /Total Capacity	143.00 KL

July 13, 2020

For Jt. Chief Controller of Explosives
WC, Mumbai

अनुज्ञप्त परिसरों का विवरण और अवस्थान
DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

अनुज्ञप्त परिसर जिसकी विन्यास सीमाएं अन्य विशिष्टयां संलग्न अनुमोदित नक्शों में दिखाई गई हैं Plot No: 746 &750, Unit-5,GIDC Estate Jhagadia , Jhagadia, Jhagadia, Taluka: Jhagadia, District: BHARUCH, State: Gujarat, PIN: 393110 स्थान पर अवस्थित है तथा उसमें निम्नलिखित 3 Under Ground tank(s) for CLASS A सम्मिलित हैं ।

The licensed premises, the layout , boundaries and other particulars of which are shown in the attached approved plan are situated at Plot No: 746 &750, Unit-5,GIDC Estate Jhagadia , Jhagadia, Jhagadia, Taluka: Jhagadia, District: BHARUCH, State: Gujarat, PIN: 393110 and consists of 3 Under Ground tank(s) for CLASS A together with connected facilities.

Note:-This is system generated document does not require signature.

Factory License

Directorate Industrial Safety & Health

Gujarat State

Directorate Industrial Safety & Health

FORM NO. 4

Gujarat State

License to work a factory

(Prescribed under Rule 5)

Registration No. **135/24219/1996**
FIN. **S06005514A**

License to work a factory

License No. **5514**
D.A. **20-Mar-1996**

License is hereby granted to

Mr. ARUN C. ASHAR

For the premises known as

UPL LIMITED

situated at

PLOT NO. 746 750 G.I.D.C. JHAGADIA

Ta.: **Jhagadia** Dist.: **Bharuch**

for use as a factory within the limits specified in the plan approved by the

Joint Director Industrial Safety and Health, Surat Region

vide No. **5707** Date **12-Oct-1995** subject to provisions of the

Factories Act, 1948 and the Rules made thereunder.

The license is issued for:

- Maximum Number of workers to be employed on any day during the Year :**Above 5000**
- Maximum installed power in B.H.P. on any day during the year :**Above 5000**

The license is valid up to 31st December **2022**,

Fees paid Rs. **155,900.00**
Fees due Rs. **155,800.00**
Excess Rs. **100.00**
Place : Bharuch
Date : 16-Oct-2020

DIRECTORATE INDUSTRIAL SAFETY & HEALTH GUJARAT STATE

Signature valid
Digitally signed by VAGHELA NAVIN DHIRAJLAL
Date: 2020.10.16 12:48:10 +05:30
Reason: Approval
Location: Bharuch

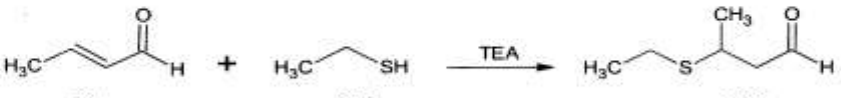
Deputy Director
Industrial Safety and Health
Bharuch

Site plant lay out approved by DISH

Annexure - 3: Process flow diagram, chemical reaction and list of raw material of Product Clethodim

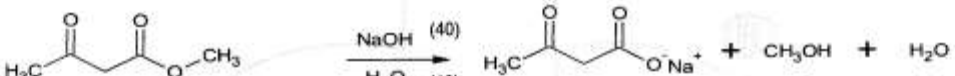
CHEMICAL REACTION

STEP-1: Preparation of ETB



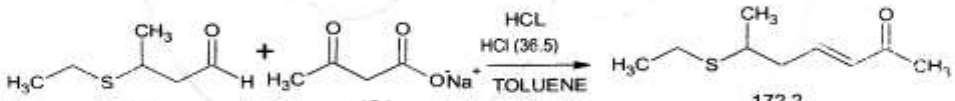
70.1 CTA + 62.1 EM → 132.2 ETB

STEP-2: Preparation of MAA SALT



116.1 MAA → 124 MAA SALT + 32 CH_3OH + 18 H_2O

STEP-2: Preparation of ST-II

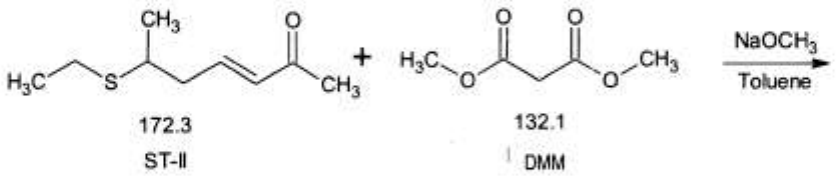


132.2 ETB + 124 Methyl Acetoto Acetate Salt → 172.2 ST-II + NaCl 58.4 + CO_2 44 + H_2O 18

FACTORY MANAGER
..., UNIT-5

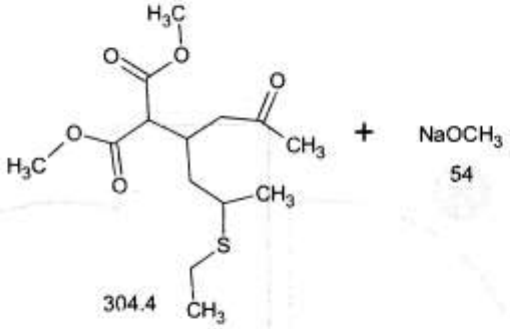
A. Treatability/Feasibility Study Report (TFS) Uploaded in XGN on 27/06/2020 13:43:05 from IP No: 125.23.24.210.
B. 25353-UPL LIMITED (UNIT NO. 5) accepts the LEGAL responsibility and undertakes that the furnished information is CORRECT & ACCURATE.

STEP-3: Preparation of ST-IIIA - ADDUCT



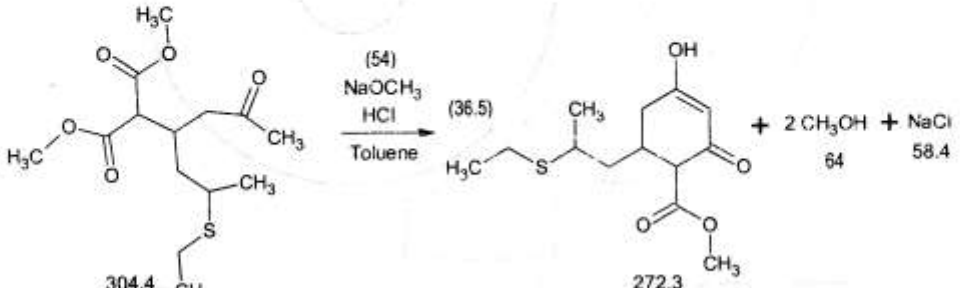
172.3
ST-II

132.1
DMM



304.4
54
ST-III ADDUCT

STEP-3: Preparation of ST-IIIB



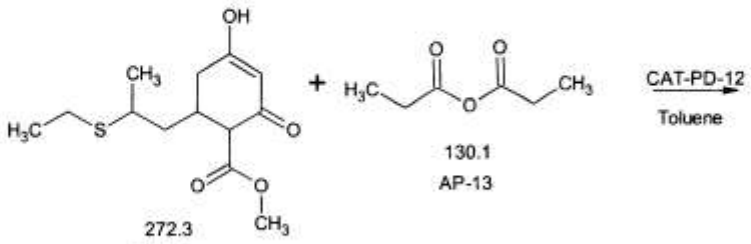
304.4
ST- III ADDUCT

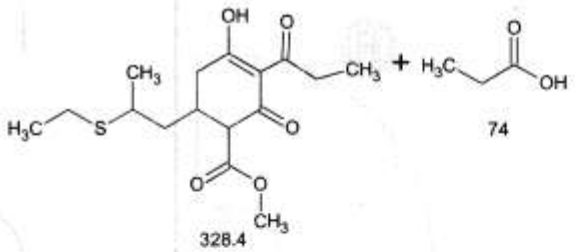
272.3
ST- III

FACTORY MANAGER
UPL LTD., UNIT-5

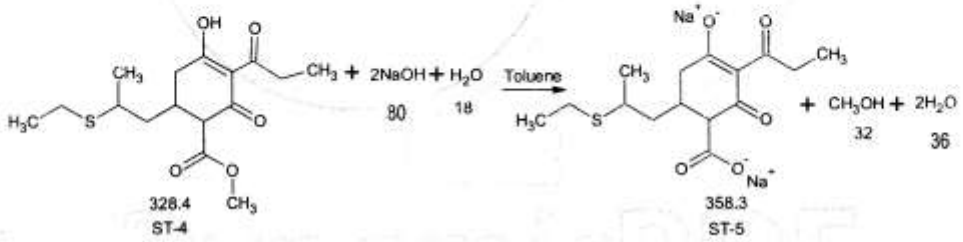
A. Treatability/Feasibility Study Report (TFS) Uploaded in XGN on 27/06/2020 13.45:05 from IP No: 125.23.24.210.
B. 25353-UPL LIMITED (UNIT NO. 5) accepts the LEGAL responsibility
and undertakes that the furnished information is CORRECT & ACCURATE.

STEP-4: Preparation of ST-IV



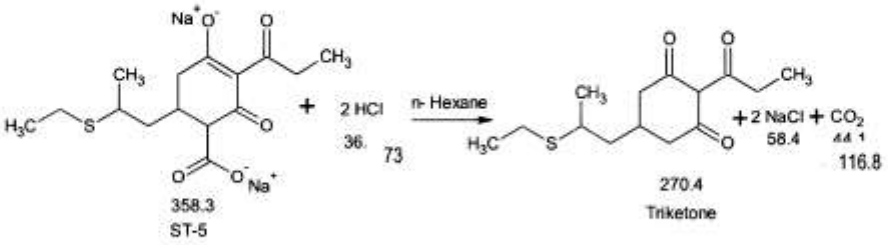


STEP-5: Preparation of ST-V

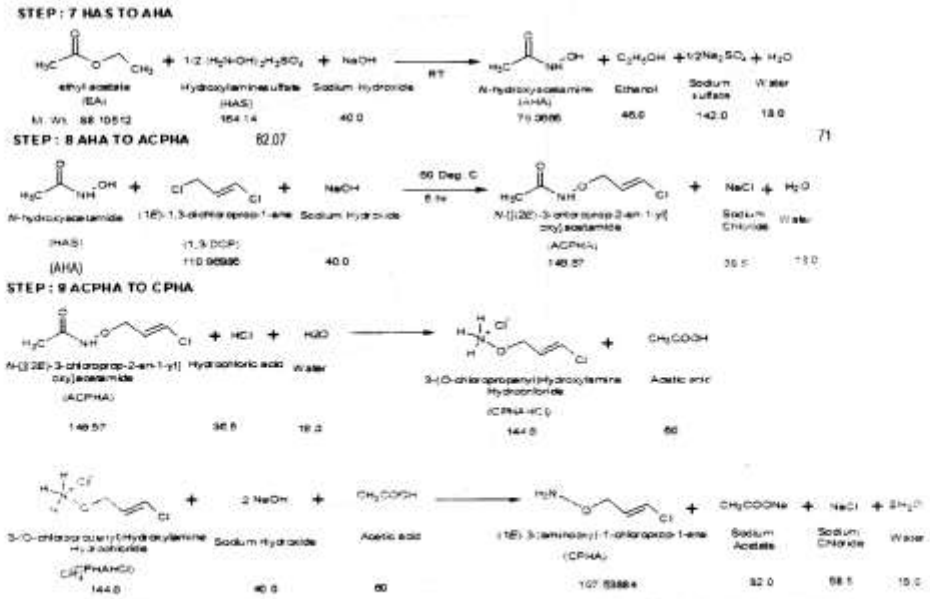


FACTORY MANAGER
UPL LTD., UNIT-5

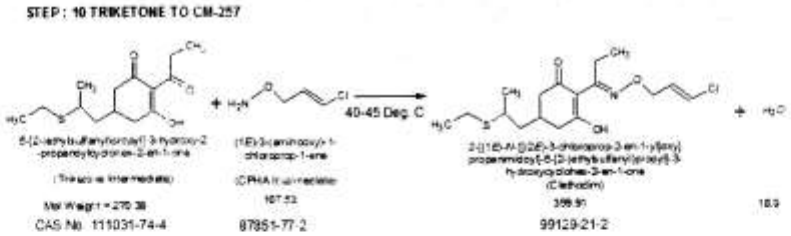
STEP-6: Preparation of Trikefone



Step-7 to Step-9: Preparation of CPHA



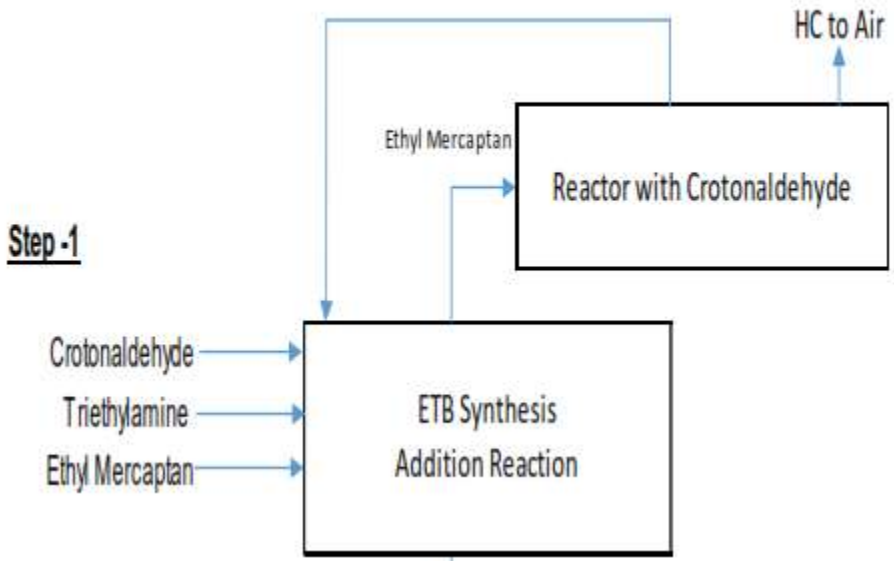
Step-10: Preparation of Product Clethodim (CM-257)

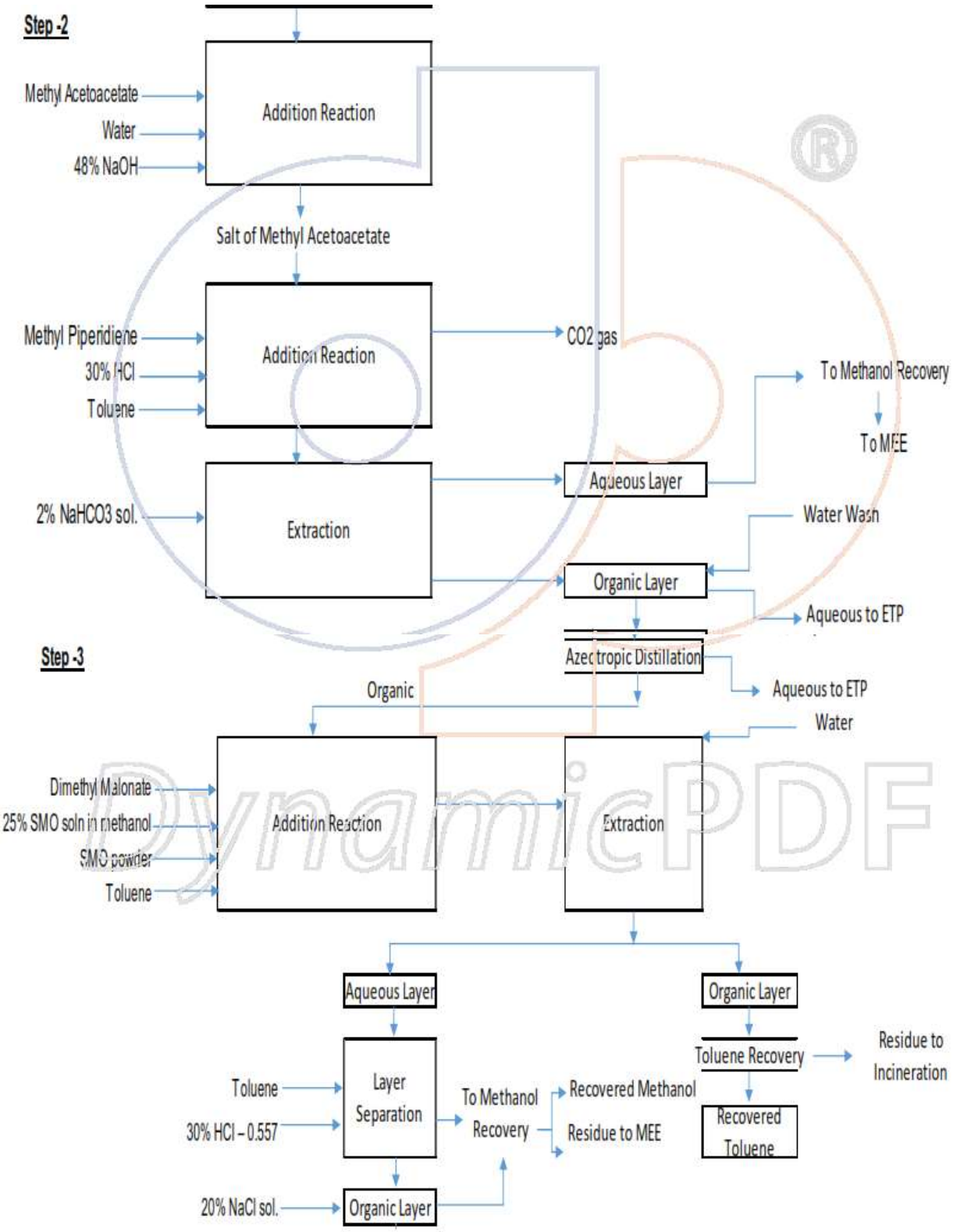


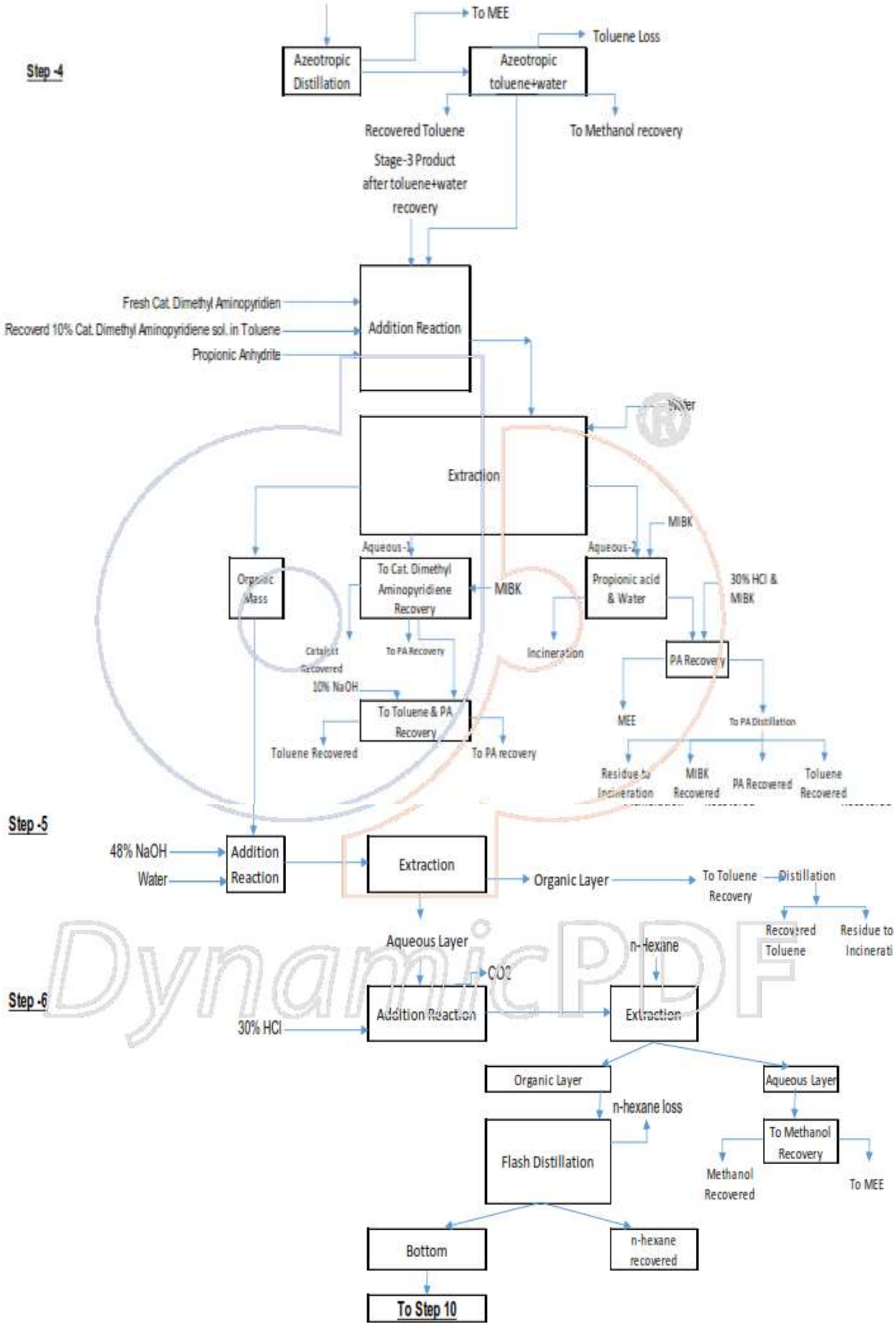
FACTORY MANAGER
UNIT-5

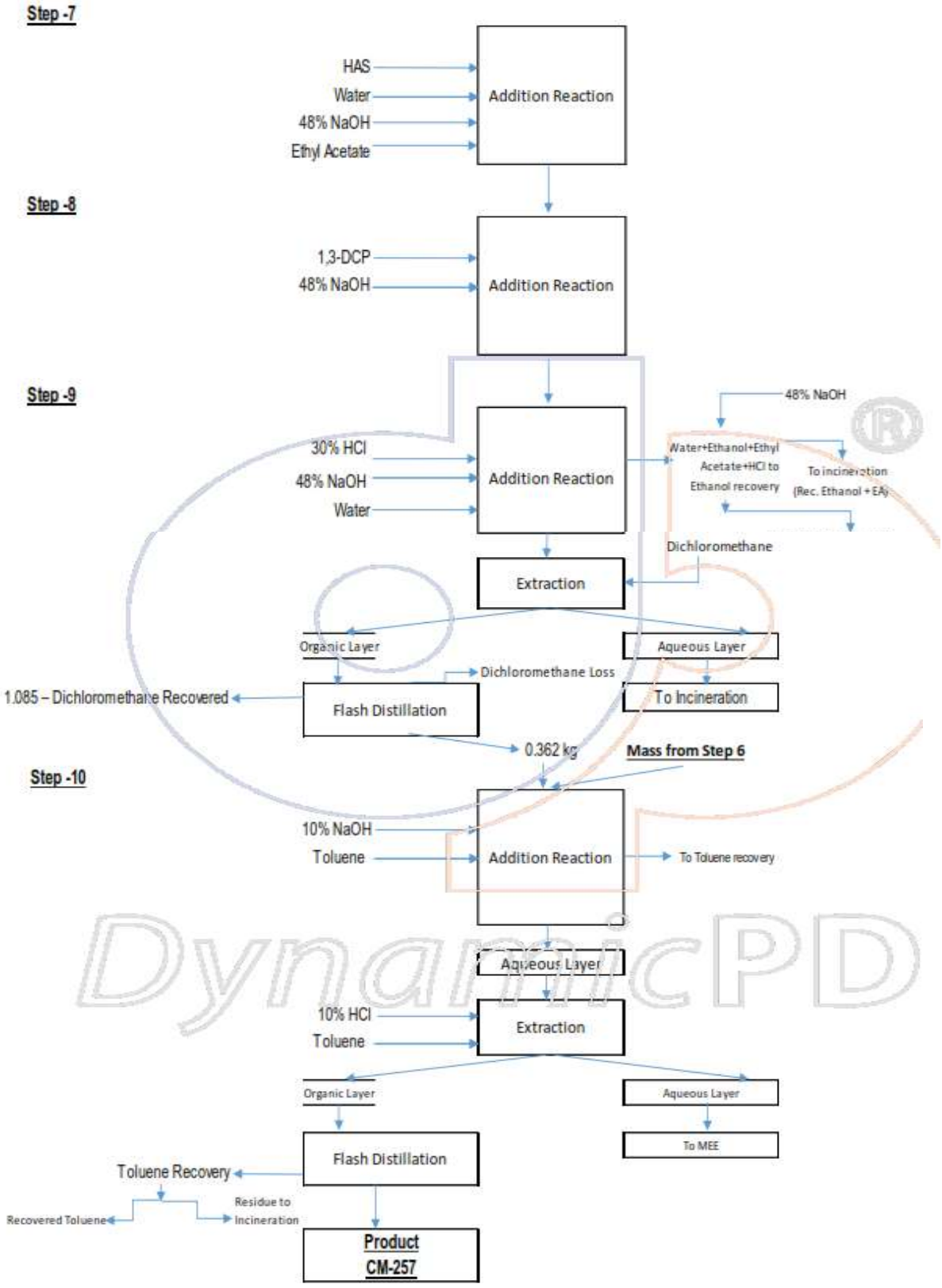
A. Treatability/Feasiblity Study Report (TFS) Uploaded in XGN on 27/06/2020 13:43:05 from IP No: 125.23.24.210.
B. 25353-UPL LIMITED (UNIT NO. 5) accepts the LEGAL responsibility and undertakes that the furnished information is CORRECT & ACCURATE.

PROCESS FLOW DIAGRAM




Step -2
Methyl Acetoacetate
Water
48% NaOH
Addition Reaction
Salt of Methyl Acetoacetate
Methyl Piperidiene
30% HCl
Toluene
Addition Reaction
CO2 gas
To Methanol Recovery
To MEE
Aqueous Layer
2% NaHCO3 sol.
Extraction
Water Wash
Organic Layer
Aqueous to ETP
Step -3
Azeotropic Distillation
Organic
Aqueous to ETP
Water
Dimethyl Malonate
25% SMO soln in methanol
SMO powder
Toluene
Addition Reaction
Extraction
Aqueous Layer
Organic Layer
Toluene Recovery
Residue to Incineration
Toluene
30% HCl – 0.557
Layer Separation
To Methanol Recovery
Recovered Methanol
Residue to MEE
Recovered Toluene
20% NaCl sol.
Organic Layer


Step -4
Azeotropic Distillation
To MEE
Azeotropic toluene+water
Toluene Loss
Recovered Toluene
To Methanol recovery
Stage-3 Product after toluene+water recovery
Fresh Cat. Dimethyl Aminopyridien
Recoverd 10% Cat. Dimethyl Aminopyridiene sol. in Toluene
Propionic Anhydrite
Addition Reaction
Extraction
MIBK
Aqueous-1
Aqueous-2
Organic Mass
To Cat. Dimethyl Aminopyridiene Recovery
MIBK
Propionic acid & Water
30% HCl & MIBK
Catalyst Recovered
To PA Recovery
Incineration
PA Recovery
10% NaOH
To Toluene & PA Recovery
MEE
To PA Distillation
Toluene Recovered
To PA recovery
Residue to Incineration
MIBK Recovered
PA Recovered
Toluene Recovered
Step -5
48% NaOH
Water
Addition Reaction
Extraction
Organic Layer
To Toluene Recovery
Distillation
Recovered Toluene
Residue to Incinerati
Aqueous Layer
n-Hexane
CO2
Step -6
30% HCl
Addition Reaction
Extraction
Organic Layer
Aqueous Layer
n-hexane loss
Flash Distillation
To Methanol Recovery
Methanol Recovered
To MEE
Bottom
n-hexane recovered
To Step 10


Step -7
HAS
Water
48% NaOH
Ethyl Acetate
Addition Reaction
Step -8
1,3-DCP
48% NaOH
Addition Reaction
Step -9
48% NaOH
30% HCl
48% NaOH
Water
Addition Reaction
Water+Ethanol+Ethyl Acetate+HCl to Ethanol recovery
To incineration (Rec. Ethanol + EA)
Dichloromethane
Extraction
Organic Layer
Aqueous Layer
Dichloromethane Loss
1.085 – Dichloromethane Recovered
Flash Distillation
To Incineration
0.362 kg
Mass from Step 6
Step -10
10% NaOH
Toluene
Addition Reaction
To Toluene recovery
Aqueous Layer
10% HCl
Toluene
Extraction
Organic Layer
Aqueous Layer
To MEE
Flash Distillation
Toluene Recovery
Recovered Toluene
Residue to Incineration
Product CM-257

List of raw material of Clethodim (CM-257)

Sr. No.	Name of Raw Material	Quantity (in MT/Month)
1	CTA – 7	43.74
2	ME-6	29.7
3	Triethyl Amine	0.09
4	CTA-7 for Scrubber	1.38
5	AAM – 11	92.91
6	NaOH (48%)	505.74
7	HCl (30%)	546.48
8	Methyl Piperidiene	5.13
9	2% NaHCO3	99.33
10	MMD-13	87.78
11	SMO Powder	36.81
12	25% SMO Soln in Methanol	16.35
13	NaCl (20%)	160.71
14	Catalyst Dimethyl Aminopyridiene	2.97
15	10% Cat. Dimethyl	45.54
16	Aminopyridiene sol. in Toluene	2.34
17	Propionic Anhydrite	85.32
18	10% NaOH	238.11
19	Ethyl Acetate	65.01
20	Hydroxyl Amine Sulphate	52.14
21	1,3-DCP	71.13
22	HCl (10%)	250.8

Material balance

INPUT	QUANTITY (kg/t)		OUTPUT	QUANTITY (kg/t)
Crotonaldehyde	265		**PRODUCT**	
Ethyl Mercaptan	180		Clethodim (96.7%)	1000
Triethyl Amine	1		**BY PRODUCT**	
Crotonaldehyde for Scrubber	8		Methanol	409
Methyl Acetoacetate	563		Propionic Acid	196
WashWater-1	640		**RECOVERY**	
NaOH (48%)	3065		ETB - From Scrubber	16
HCl (30%)	3312			
Methyl Piperidiene	31		Toluene	9185
Toluene	9626		Catalyst Dimethyl Aminopyridiene	276
2% NaHCO3	602		MIBK	870
Wash Water - 2	550		n-Hexane	1873
MMD-13	532		Dichloromethane	1085
SMO Powder	223		**TO ETP**	
SMO in Methanol (25%)	99		Stream - 1	379
Water	791		Stream - 2	28
NaCl (20%)	974	Clethodim (1000 Kg)	Stream - 3	4050
Catalyst Dimethyl Aminopyridiene	18		Stream - 4	553
10% Cat. Dimethyl Aminopyridiene sol. in Toluene	28		**TO MEE**	
			Stream - 1	2216
Toluene with Catalyst	248		Stream - 2	2437
Propionic Anhydrite	517		Stream - 3	49
Water	939		Stream - 4	884
Water wash to Aq. Layer	900		Stream - 5	5317
10% NaOH	63		**TO INCINERATOR**	
MIBK	916		Stream - 1	547
Water	3296		Stream - 2	3
n-Hexane	1972		Stream - 3	41
Ethyl Acetate	394		Stream - 4	71
Hydroxyl Amine Sulphate	316		Stream - 5	263
			Stream - 6	162
Water	594		Stream - 7	1443
1,3-DCP	431		Stream - 8	4220
Water	1021		**TO AIR**	
Dichloromethane	1142		HC	0.08
NaOH (10%)	1380		CO_2	245
HCl (10%)	1520		**FUGITIVE EMISSIONS**	
Water	1100		Solvent Losses	440
TOTAL	**38256**		**TOTAL**	**38256**

Annexure - 4: Head count notice by DISH

Submitted by other Dept

[illegible] અને
નાયબ ઇન્સ્પેક્ટરશ્રી, ઝઘડિયા તથા
નાયબ નિયામકશ્રી, ઔદ્યોગિક
સલામતી અને સ્વાસ્થ્ય, ભરૂચ.
તા. ૨૩/૦૨/૨૦૨૧

પ્રતિ,

ભોગવટાદારશ્રી/વ્યવસ્થાપકશ્રી,
યુ.પી.એલ. લિમિટેડ (યુનીટ-૫),
પ્લોટ નં. - ૭૪૬/૭૫૦,
જી.આઈ.ડી.સી. ઝઘડીયા,
જી. - ભરૂચ.

વિષય: - તા. ૨૩/૦૨/૨૦૨૧ ના રોજ આશરે ૦૧:૪૫ કલાકે આપના પ્લાન્ટમાં થયેલ એક્ઝોથર્મિક ઘટના બાબત.

મહાશય,

ઉપરોક્ત વિષયના અનુસંધાને જણાવવાનું કે તા. ૨૩/૦૨/૨૦૨૧ ના રોજ મોડી રાત્રના આશરે ૦૧:૪૫ કલાકે આપના પ્લાન્ટમાં એક્ઝોથર્મિક/અકસ્માતની ઘટના બનેલ. આપના પ્લાન્ટમાં/કારખાનામાં સદર ગંભીર અકસ્માતની ઘટના બનતાં તા. ૨૨/૦૨/૨૦૨૧ તથા તા. ૨૩/૦૨/૨૦૨૧ ના રોજ આપના પ્લાન્ટ સહિત સમગ્ર કારખાનામાં પ્રવેશેલ/ફરજ પર આવેલ શ્રમયોગીઓ/કર્મચારીઓ તથા ગંભીર અકસ્માતની ઘટના (એક્ઝોથર્મિક) બાદ કારખાનામાંથી સહીસલામત રહેલ શ્રમયોગીઓ/કર્મચારીઓના નામ-હાજરી તેમજ ઇજા પામેલ શ્રમયોગીઓ/કર્મચારીઓના નામ-હાજરી સહિતની વિગતો તેમજ જો કોઈ શ્રમયોગી/કર્મચારી ગુમ થયેલ હોય તો તેઓનાં નામ-હાજરી સહિતનો સમગ્ર રેકોર્ડ તમામ આધાર-પુરાવા

[illegible]

સાહેબ નામે સહી કરનારની સમક્ષ રજૂ કરવા
બાબતે સાધનોની ઇન્ડિકેશન નોંધ સાધનો
આવે છે. વધુમાં આ ગંભીર અકસ્માત અંગેનું ન
નકલ સાહેબનું પંચનામું સ્થળે આ સાથે રજૂ કરવામાં
આવે છે.

સ્થળ: - યુ.પી.એલ. લિમિટેડ (યુનિટ-૫)

તારીખ: - 23/02/2021.

(એન.ડી. વાઘેલા)
નાયબ નિયામક
(ઔદ્યો. સલા. અને સ્વાસ્થ્ય)
(ભરૂચ)

([illegible] પિઠાવાલા)
(સબ ડિવિઝનલ મેજીસ્ટ્રેટ
નાયબ કલેક્ટરશ્રી, ઝઘડિયા.

Rupesh Shah
([illegible] - 02/02)
Head (Safety)
UPL Ltd. GIDC Zagadia

Panchal
(Ajay Panchal)
Sr. Mgr. - Env.
UPL Unit-1

(Deepak Roy)

નકલ સાદર રવાના:-

નાયબ કલેક્ટરશ્રી અને ડિસ્ટ્રીક્ટ મેજીસ્ટ્રેટ સાહેબશ્રી, ભરૂચ ના
જાણ સારૂ.

GM-HR

RAJNEESH BHADAURIA
O-5
UPL-5

J. C. Trivedi
Jaydeep Trivedi
Safety Department
Safety manager
UPL-5
Jhagadia

Annexure - 5: Reply of Head Count notice by unit

UPL Limited, Unit - 5
Plot No.746 & 750, P.B. No.9
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
t: +91 2645 226013
f: +91 2645 226017

તા.: ૨૩.૦૨.૨૦૨૧

પ્રતિ,
નાયબ નિયામકશ્રીની કચેરી,
ઔદ્યોગિક સલામત અને સ્વાસ્થ્ય,
ભરૂચ.

વિષય: તા. ૨૩.૦૨.૨૦૨૧ ના રોજ નાં હેડકાઉન્ટ બાબત.

માનનીય સાહેબશ્રી,

ઉપરોક્ત વિષયનાં અનુસંધાને જણાવવાનું કે તા. ૨૩.૦૨.૨૦૨૧ નાં રોજ નાઈટ શીફ્ટનાં કામ કરેલ કામદારોની વિગત અને ખોવાયેલ તથા મૃત્યુ પામેલ કામદારોની વિગત આ પત્ર સાથે જોડેલ છે. તદઉપરાંત ફર્સ્ટ ઈન્ફોરમેશન રીપોર્ટ પણ આ સાથે જોડેલ છે.

યુપીએલ લી. વતી,

DVB

ઓથોરાઈઝડ સીગ્નેટરી.

o/c

જોડાણ: ૧. નાઈટ શીફ્ટનાં કામ કરેલ કામદારોની વિગત
૨. ખોવાયેલ તથા મૃત્યુ પામેલ કામદારોની
૩. ફર્સ્ટ ઈન્ફોરમેશન રીપોર્ટ

cc to : SDM Jhagadia.
23/2/21

Annexure-1

Sr	Code	Name	Plant	Category	Remarks	Status	Hospital
1	1100142	SANJAY DOSHI	CCP	Staff			
2	1201176	KAPIL PATEL	MANCOZEB	Staff			
3	1201232	UMESH SHAH	MANCOZEB	Staff			
4	1201419	JIJABRAO BORSE	MANCOZEB	Staff			
5	1201495	SHASHIKANT BHAGAT	MANCOZEB	Staff			
6	1201512	GAJANAN HATTURE	ELECTRICAL	Staff			
7	1201528	AJAYSHANKAR DUBEY	MANCOZEB	Staff			
8	1201736	HARENDRA KOSAMIYA	CCP	Staff			
9	1201737	RAJESH PATEL	CCP	Staff			
10	1203022	VIJAY K PATEL	GF-1	Staff			
11	1203046	SAILESHKUMAR P PATEL	GF-1	Staff			
12	1203266	ANIL PATIDAR	MANCOZEB	Staff			
13	1203362	HARDIK PATEL	MANCOZEB	Staff			
14	1203427	PRAFUL H PATEL	UPH 5000	Staff			
15	1203476	TUSHAR MORI	MANCOZEB	Staff			
16	1203492	JAYENDRA PARMAR	MANCOZEB	Staff			
17	1203670	RAKESH BHAGAT	CCP	Staff			
18	1203678	shambhu bhikhabhai chauhan	PCL3	Staff			
19	1203707	VINAY SHUKLA	GF-2	Staff			
20	1203716	ALPESH M PATEL	GF-1	Staff			
21	1203782	VANRAJSINH N. RAJ	ACEPHATE	Staff			
22	1204200	Santosh hiralal patel	MANCOZEB	Staff			
23	1204238	VIVEK R PANDEY	GF-1	Staff			
24	1204242	ASLAM NASHRUDDIN RENGREZ	UTILITY	Staff			
25	1204258	MUKESH PATEL	GF-1	Staff			
26	1204286	RAJDEEP CHOVATIA	SE 367	Staff			
27	1204319	NARENDRA PATEL	GF-1	Staff			
28	1204328	MAHESH PATEL	GF-3	Staff			
29	1204350	KHIMJI A SOLANKI	GF-1	Staff			
30	1204383	SANJAY PATEL	GF-1	Staff			
31	1204387	VIPUL PARMAR	GF-1	Staff			
32	1204390	HARESH PATEL	OMEGA PLANT	Staff			
33	1204439	JIGNESH P VARMORA	GF-1	Staff			
34	1204521	VIJAYKUMAR B VASAVA	UPDT	Staff			
35	1204527	HARDIK SHAH	UPDT	Staff			
36	1204536	ARJUNSINH RANA	UPDT	Staff			
37	1204539	HIRENKUMAR DARJI	UPDT	Staff			
38	1204621	HITESH SOLANKI	GF-1	Staff			
39	1204677	HARESH SOLANKI	ANTRACOL	Staff			
40	1204681	UPENDRA SOLANKI	UPF-35	Staff			
41	1204705	RINKESH PATEL	UPF-35	Staff			
42	1204853	UMESH PANCHAL	ELECTRICAL	Staff			
43	1204921	RAHUL KUMAR	POWER PLANT	Staff			
44	1204950	RAHUL SAKARIYA	ANTRACOL	Staff			
45	1204967	RONAK CHAUHAN	INSTRUMENT	Staff			
46	1204974	CHINTAN RANA	ANTRACOL	Staff			
47	1204977	SATPAL SINGH	ACROLEIN	Staff			
48	1205040	PANKAJ VASAVA	MANCOZEB	Staff			
49	1205050	RAJESHKUMAR PATEL	MECH (G-2)	Staff			
50	1205208	JIGNESH PRAJAPATI	ACROLEIN	Staff			
51	1205244	VAIBHAV KALE	UPF-35	Staff			
52	1205319	PRADIPKUMAR P PATEL	UPH 5000	Staff			
53	1205370	MAHIPALSINH GOHIL	UPH 5000	Staff			
54	1205437	NITIN RAVINDRALAL SHRIVASTAV	UPH 5000	Staff			
55	1205485	YATINKUMAR N PATEL	UPF-35	Staff			
56	1205533	NARENDRA GULABRAO GHARATE	UPH 5000	Staff			
57	1205551	VINOD DALSHUKHBHAI PATEL	UTILITY	Staff			
58	1205761	GIRISH PARSOTTAMBHAI PATEL	NASH	Staff			
59	1205844	MAHENDRA VARJANGABHAI PARMAR	UPI-12	Staff			
60	1205879	TARUNESH SURESH CHANDRA MOHAN	MR 205	Staff			
61	1205940	MILAN KYADA	MR 205	Staff			
62	1205942	SAGAR SUKHADIYA	MR 205	Staff			
63	1206029	BHAVINKUMAR DHANESHBHAI CHOKSI	MNZ WDR PHASE-II	Staff			
64	1206091	NIRAV PATEL	Q.A.	Staff			
65	1206142	ASHWIN PARBATBHAI PIPROTAR	MECH (G-4)	Staff			
66	1206162	GAURANG PATEL	Q.A.	Staff			

67	1206192	JIGNESH BHAVSAR	Q.A.	Staff			
68	1206193	HARESH PATEL	MECH (G-3)	Staff			
69	1206277	HARSHAD NAGINBHAI VASAVA	UPH 5000	Staff			
70	1206281	JIGNESH JASHVANTBHAI PATEL	UTILITY	Staff			
71	1206284	ANANT LOKRANJAN TRIPATHI	TEP	Staff			
72	1206312	NEERAJ RAMNIWASH VISHWAKARMA	TEP	Staff			
73	1206327	RAKESH BUDHABHAI GOHIL	Q.A.	Staff			
74	1206330	RAJKUMAR KUSHWAHA	TEP	Staff			
75	1206354	RAMSINGH CHNADRAPAL YADAV	ELECTRICAL	Staff			
76	1206380	HARESHKUMAR RAMESHCHANDRA MEHTA	MECH (G-4)	Staff			
77	1206384	RAJESH MAGANBHAI SARADVA	MECH (G-4)	Staff			
78	1206389	RONAK AJITBHAI PATEL	TEP	Staff			
79	1206409	SANJAYKUMAR SHAKRABHAI CHAUHAN	MECH (G-4)	Staff			
80	1206410	RAMAN KUMAR NETRAM SINGH	TEP	Staff			
81	1206415	RAKESH THAKOR BHAI PARMAR	MANCOZEB	Staff			
82	1206425	SACHIN SANTNATH CHAPALGAONKAR	TEP	Staff			
83	1206455	JIGARPALSINH NARENDRASINH SISODIYA	Q.A.	Staff			
84	1206484	NAYAN BHARATBHAI RAMOLIYA	SE 357	Staff			
85	1206503	MANISH NAVINBHAI VASAVA	GF-3	Staff			
86	1206508	ALKESH VEJANANDBHAI KADAVALA	GF-2	Staff			
87	1206519	ARPIT RAJENDRABHAI THAKKAR	INSTRUMENT	Staff			
88	1206521	SANJAY BALUBHAI PARMAR	GF-2	Staff			
89	1206524	KAILASH LAXMAN BANTE	POWER PLANT	Staff			
90	1206537	ANKIT BHARATBHAI PATEL	GF-2	Staff			
91	1206567	RAJIV KUMAR SHAKYA	ACEPHATE	Staff			
92	1206568	DIVYESH BIPINBHAI PATEL	GF-1	Staff			
93	1206610	SANTOSH R KUMAR	GF-2	Staff			
94	1206617	YOGESH MANSHUKHBHAI VASAVA	MECH (G-3)	Staff			
95	1206625	HEMANT VASANTBHAI PARMAR	GF-1	Staff			
96	1206639	AMIT NITYANAND TIWARI	POWER PLANT	Staff			
97	1206660	NAVINKUMAR RAMANBHAI RATHVA	GF-2	Staff			
98	1206680	MITESH CHATURBHAI VASANI	GF-2	Staff			
99	1206684	HIMANSHU BACHUBHAI PATEL	GF-1	Staff			
100	1206685	SHRIKANT NATVARBHAI PATEL	INSTRUMENT	Staff			
101	1206698	GAURAV RAJNIKANT MAKWANA	GF-2	Staff			
102	1206702	KAUSHAL NARESHKUMAR MODI	GF-1	Staff			
103	1206703	BHAUTIK HASMUKHBHAI GORASIYA	GF-1	Staff			
104	1206717	PRAFUL JAYANTIBHAI BOGHANI	GF-1	Staff			
105	1206721	CHINTAN MAHESHBHAI CHAUDHRY	GF-3	Staff			
106	1206776	SHRIKANT RATILAL PATEL	GF-1	Staff			
107	1206833	PRAVIN PATEL	UPH 5000	Staff			
108	1206835	DEVABHAI VANKAR	PCL3	Staff			
109	1206906	HIRENKUMAR PATEL	MECH (G-4)	Staff			
110	1206922	RAJKUMAR KUSHWAHA	ACROLEIN	Staff			
111	1206962	ALPESH VASAVA	ELECTRICAL	Staff			
112	1206965	JUABRO SANER	GF-2	Staff			
113	1206975	SAURABH VASUDEVBHAI KACHHIA	UPI-14	Staff			
114	1206978	NIKUNJ BABULAL LORIYA	GF-2	Staff			
115	1206996	HITESH BHARATBHAI BHIMANI	ELECTRICAL	Staff			
116	1206998	DHARMESH MANHARBHAI PATEL	INSTRUMENT	Staff			
117	1207045	SHAILESH CHHINDIYABHAI VASAVA	CM 257	Staff			
118	1207077	SANDEEP KANUBHAI DESAI	UPI-14	Staff			
119	1207085	KRISHNA CHANDUBHAI VASAVA	UPI-14	Staff			
120	1207109	PRADIP HILAL BORASE	UPH 5000	Staff			
121	1207123	AJAY NARHARI KAMBLE	MR 205	Staff			
122	1207129	BRIKESH KUMAR RAM PRATAP KUMAR	UPF-35	Staff			
123	1207159	JAYESH BHIKHUBHAI NANERA	GF-2	Staff			
124	1207162	RAJENDRA CHAMPAKBHAI VASAVA	MANCOZEB	Staff			
125	1207178	JITENDRA RISHIPAL	GF-2	Staff			
126	1207210	DINESH JAYNTIBHAI PATEL	UTILITY	Staff			
127	1207216	RAVIKUMAR MAHARAJSINGH CHAUDHARY	GF-2	Staff			
128	1207227	JAYDEEP MUKESHBHAI PATEL	Q.A.	Staff			
129	1207228	ANKITKUMAR MAHESHBHAI PATEL	UPF-35	Staff			
130	1207244	DHAVAL PATEL	GF-2	Staff			
131	1207263	JAIMIN RANA	Q.A.	Staff			
132	1207289	AJITBHAI GORDHANBHAI VASAVA	UPF-35	Staff			
133	1207290	ANUJKUMAR VIRENDRA GAUR	UPF-35	Staff			
134	1207292	VINOD GOKUL MAHAJAN	ETP	Staff			

135	1207298	AYUSH KHARVA	GF-3	Staff			
136	1207339	MAHESH JADAV	MANCOZEB	Staff			
137	1207370	VIKAS RAMDAS LOHOT	UPI-14	Staff			
138	1207371	ARUN ARVIND PATHAK	UPH 5000	Staff			
139	1207372	VIREN R PATEL	POWER PLANT	Staff			
140	1207374	HITESH SURYAVANSHI	GF-3	Staff		Outdoor	Jayaben
141	1207414	PARTH RAMESHBHAI PANSURIA	GF-3	Staff			
142	1207417	MEHUL JAGADISHBHAI THESIYA	GF-3	Staff			
143	1207434	SHESHANT MAHESHBHAI MAKWANA	GF-3	Staff			
144	1207435	VIJAY PRATAP SINGH	CCP	Staff			
145	1207446	ASHISH SINGH	GF-2	Staff			
146	1207447	SHAILESH RAYSANG THAKOR	GF-3	Staff			
147	1207455	HEMANG RAMESHCHANDRA MEHTA	CCP	Staff			
148	1207461	GAJEANDER SINGH	GF-3	Staff			
149	1207464	PIYUSH AMRUTLAL CHAVDA	GF-1	Staff			
150	1207465	JITENDRA MAHESHWAR DAR DAS	GF-3	Staff			
151	1207468	PINKESH HIMMATBHAI PATEL	GF-3	Staff			
152	1207472	JEETESH ZEENABHAI MACHHI	GF-3	Staff			
153	1207473	ASHOK RANCHODBHAI VASAVA	GF-2	Staff			
154	1207481	DHARMESH MANGUBHAI PATEL	TEP	Staff			
155	1207482	DEVIDAS YUVRAJ PATIL	GF-2	Staff			
156	1207495	NILESH DUDHATRA	GF-3	Staff		Outdoor	Healing
157	1207501	ARPIT PATEL	GF-2	Staff			
158	1207525	DIXIT JAGDISHBHAI PATEL	SE 367	Staff			
159	1207541	SANTKUMAR JAYRAM MISHRA	SE 367	Staff			
160	1207550	MAYUR JAGABHAI SHIROYA	SE 367	Staff			
161	1207552	VIJAY BHIKHAJI RUMALE	SE 367	Staff			
162	1207557	RAKESH GHANSHYAMBHAI SOLANKI	SE 367	Staff			
163	1207558	TUSHAR BAHADURSING GIRASE	SE 367	Staff			
164	1207563	ASHU SATYAVEER SINGH	GF-3	Staff			
165	1207565	SUSHIL SHIVKUMAR KAMAL	SE 367	Staff			
166	1207567	DEVANG ANILBHAI JOSHI	DPMP	Staff			
167	1207591	RAJESH CHHATRAPAL SAROI	SE 367	Staff			
168	1207608	SAMJAYKUMAR RATILAL SEVAK	SE 367	Staff			
169	1207612	HEMANT PARSOTTAMBHAI PATEL	SE 367	Staff			
170	1207636	RAKESH PATEL	UTILITY	Staff			
171	1207644	PAWAN DESALE	PCL3	Staff			
172	1207665	RAHUL MACHHI	GF-1	Staff			
173	1207687	SAFIKUR ISMAILBHAI BADI	QA	Staff			
174	1207713	YOGESH VAJUBHAI SAKHIYA	SE 367	Staff			
175	1207742	DINESH KOMALSING GIRASE	UTILITY	Staff			
176	1207743	SMRUTIRANJAN GADADHAR PANIGRAHI	POWER PLANT	Staff			
177	1207759	JIGNESH CHIMANBHAI PARMAR	GF-1	Staff			
178	1207779	JAYESH KATAKIA	INSTRUMENT	Staff			
179	1207786	RAMKRISHNA KHAIRNAR	PCL3	Staff			
180	1207809	SAMADHAN NANDERE	MR 205	Staff			
181	1207860	BHAVIN PRAJAPATI	UPI-14 MEE	Staff			
182	1207879	JIGNESH PARMAR	UPI-14 MEE	Staff			
183	1207938	CHIRAG THUMMAR	MANCOZEB	Staff			
184	1207944	Sandeep Singh Yadav	SAFETY	Staff			
185	1207986	SHAILESH SISARA	UPI-12	Staff			
186	1208007	MOHAN MAHAJAN	GF-1	Staff			
187	1208008	PRAVEEN PRAJAPATI	ELECTRICAL	Staff			
188	1208053	SOHIL MULTANI	GF-1	Staff			
189	1208064	ANKUR PARMAR	OMEGA PLANT	Staff			
190	1208128	ILESHBHAI VASAVA	UPI-12 MEE	Staff			
191	1208147	JAYSINH RATHOD	CCP	Staff			
192	1208169	RIHIL MISTRY	MGCO3	Staff			
193	1208173	YAGNIK HIRPARA	GF-2	Staff			
194	1208180	HIREN KHATRI	SAFETY	Staff			
195	1208217	SATISH VADHER	GF-2	Staff			
196	1208220	VIJAY PARMAR	CM 257	Staff			
197	1208224	MEHUL TARAR	GF-1	Staff			
198	1208259	SUBRATA SAMANTA	GF-2	Staff			
199	1208287	Pravin Battisa	CM 257	Staff			
200	1208315	SMITKUMAR PATEL	CM 257	Staff		Outdoor	Jayaben
201	1208380	AKSHAY SONWANE	MNZ WDR PHASE-II	Staff			
202	1208381	PRASENJIT MONDAL	ACROLEIN	Staff			

203	1208421	VIJAY KUMAR PATEL	ANTRACOL	Staff			
204	1208628	RAJESHKUMAR PATEL	CCP	Staff			
205	1208668	JAGDISHBHAI VASAVA	CM 257	Staff			
206	1208670	KRUNAL PATEL	CM 257	Staff		Not found	
207	1208689	KRUNAL SURATI	GF-3	Staff		Outdoor	Jayaben
208	1208705	HARDIK JAMALIYA	CM 257	Staff			
209	1208731	Chandan Mishra	CM 257	Staff			
210	1208733	Dharmendrsinh Ravalji	CM 257	Staff			
211	1208734	Hardikbhai Patel	CM 257	Staff		Indoor	Jayaben
212	1208741	Ketankumar Gevariya	CM 257	Staff		Not found	
213	1208774	JAYESH VASAVA	GF-2	Staff			
214	1208780	VANRAJSINH DODIYA	CM 257	Staff		Not found	
215	1208864	PRADEEP MISHRA	CLA.	Staff			
216	1208924	TEJAS BORSE	CM 257	Staff		Outdoor	Jayaben
217	1208934	KIRAN PARMAR	GF-3	Staff			
218	1208963	NEHAL MEHATA	CM 257	Staff		Not found	
219	1208965	JIVAN SOMANING GOTSURVE	CM 257	Staff			
220	1209007	VISHVAJITSINH PRAVINSINH CHARIYA	CLA.	Staff			
221	1209011	MITESH TILALA	SE 367	Staff			
222	1209045	NITESHKUMAR PATEL	CM 257	Staff		Outdoor	Jayaben
223	1209094	HARDIK AMRUTIYA	GF-3	Staff			
224	1209096	JAY CHANDARANA	UPI-14	Staff			
225	1209099	SOLANKI VIJAY	POWER PLANT	Staff			
226	1209161	DHAVAL RANA	GF-2	Staff			
227	1209163	RAGHUNATH	SE 367	Staff			
228	1209192	AJAY LINGAYAT	POWER PLANT	Staff			
229	1209208	JAY MORI	ETP	Staff			
230	1209233	KRIPAL DODIYA	GF-2	Staff			
231	1209269	SMIT PARMAR	UTILITY	Staff			
232		Mihir Vaniya	Acephate	Quess			
233		Sahil Ahir	Acephate	Quess			
234		Santosh Vasava	MANCOZEB	Quess			
235		Darshit Rupapara	CS2	Quess			
236		Urvesh Patel	UPI-12 MEE	Quess			
237		Santosh	GF-1	Quess			
238		Sanat Patel	GF-2	Quess			
239		Sandeep Mali	ETP	Quess			
240		Daxesh Parekh	PROJECT	Quess			
241		Nirav Patel	MR 205	Quess			
242		Shantilal	Admin	Avi	Driver		
243		Ajay	Admin	Avi	Driver		
244		Kamlesh	Admin	Tirth	Driver		
245		Imtiyaz	Admin	Dwlip	Driver		
246		Vipul	Admin	Jay Mataji	Driver		
247		Haresh	Admin	Jay Mataji	Driver		
248		Ashwin	Admin	Jay Mataji	Driver		
249		Sanjay	Admin	Jay Mataji	Driver		
250	1208316	Nitesh Bind	CM 257	Staff		Indoor	Jayaben
251	1206656	Devendrasinh Dhami	SAFETY	Staff		Indoor	Jayaben
252	1000002462	SURESH CHANDRA	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
253	1000002568	VIJAY KUMAR KRISHNA	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
254	1000002674	VIJAY KUMAR SADHU RAM	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
255	1000002735	DEEPAK KOL	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
256	1000006631	ARUNAKUMAR	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
257	1000007678	PRAVIN KUMAR JAMUNKAR	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
258	1000007681	KAILESH MUNNA	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
259	1000007771	KAMAL SINGH KASDE	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
260	1000007886	AMAR SINGH KORKU	SE 367	ROYAL SECURITY& LABOUR ORGANISATION			
261	1000001606	PRAMODKUMAR RADHACHARAN	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
262	1000001648	SHANKARLAL PATIL	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
263	1000001689	SUKAI RAWAT	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
264	1000002451	SHYAM LAL JAMBEKAR	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
265	1000002459	SARVINDAR SINGH	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
266	1000002481	SUMIT RANJIT SINGH	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
267	1000003622	GOVIND KASDEKAR	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
268	1000005200	NARENDRABHAI NAVALBHAI VASAVA	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
269	1000005236	DOSHI MANISH KUMAR	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			
270	1000005618	ARUN KUMAR YADAV	GF-3	ROYAL SECURITY& LABOUR ORGANISATION			

271	1000007347	BALAKRAM SILALE	GF-3	ROYAL SECURITY& LABOUR ORGANISATION		
272	1000007348	ROHIT RAKESH KUMAR	GF-3	ROYAL SECURITY& LABOUR ORGANISATION		
273	1000007679	AJAY GIRDHARI	GF-3	ROYAL SECURITY& LABOUR ORGANISATION		
274	1000007888	VASUDEV PARASRAM JAMBEKAR	GF-3	ROYAL SECURITY& LABOUR ORGANISATION		
275	1000009025	SANTULAL TUMLA	GF-3	ROYAL SECURITY& LABOUR ORGANISATION		
276	1000005653	VASAVA SUNIL NARPAT BHAI	ETP	ROYAL SECURITY& LABOUR ORGANISATION		
277	1000007349	RAJESH KALME	ETP	ROYAL SECURITY& LABOUR ORGANISATION		
278	1000001595	MANOJBHAI HARDAS SODHA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
279	1000001733	VISHNU RAVAT	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
280	1000002469	AMIT YADAV	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
281	1000002474	MANJEET SINGH	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
282	1000003043	IRASAD AHAMAD	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
283	1000003359	RANJEET YADAV	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
284	1000003600	TEJBHAN YADAV	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
285	1000003602	AMIT KUMAR	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
286	1000003859	HARIOM KUSHWAHA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
287	1000005863	VASAVA SURESH VIRSANG BHAI	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
288	1000005876	DIVANBHAI MAHENDRA VASAVA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
289	1000006805	ROHIT SANTOSH SHARMA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
290	1000007447	VIJAY ACCHELAL KOL	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
291	1000007469	AVDHESH PINDARE TUKARAM	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
292	1000007818	PANKAJ SUBHASH CHANDRA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
293	1000007819	VIMAL BABLU SHARMA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
294	1000007884	JAMNALAL MOHARYA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
295	1000007887	RAJESH JAMBEKAR	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
296	1000007922	ANAND PRAJAPATI	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
297	1000007968	CHOTELAL KEVAT	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
298	1000009023	CHOUTU KADMA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
299	1000009602	JAGRAM ASHARAM	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
300	1000010176	RAMSINGH JAGDISH KUSHWAHA	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
301	1000010725	RAHUL KALYAN SINGH	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
302	1000011128	PAWAN GHANSHYAM	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
303	1000001652	RAMCHANDRA KAJLE	MR 205	ROYAL SECURITY& LABOUR ORGANISATION		
304	1000002425	ABHISHEK JARSNE	MR 205	ROYAL SECURITY& LABOUR ORGANISATION		
305	1000002709	VIJAY BHILALA	MR 205	ROYAL SECURITY& LABOUR ORGANISATION		
306	1000003620	FOOL SINGH	MR 205	ROYAL SECURITY& LABOUR ORGANISATION		
307	1000006452	AVINASH KAJLE	MR 205	ROYAL SECURITY& LABOUR ORGANISATION		
308	1000011135	DULI CHANDRA	MR 205	ROYAL SECURITY& LABOUR ORGANISATION		
309	1000001649	DEEPENDRA	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
310	1000001688	SANOJ KUMAR	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
311	1000001698	RAJU KUSWAH	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
312	1000001718	VIJAY JARSNE	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
313	1000001727	RAMPRAKASH DINKAR	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
314	1000002420	AMAN KUMAR	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
315	1000002723	MANISH YADAV	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
316	1000003446	SHIV BIHARI	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
317	1000003994	RAJU KASDE	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
318	1000006455	KUNJILAL	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
319	1000006839	OMPRAKASH	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
320	1000007926	MITHUN	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
321	1000009349	VIRAN KHUSHWAHA	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
322	1000010502	ARVIND PANDEY	GF-2	ROYAL SECURITY& LABOUR ORGANISATION		
323	1000003281	OMPRAKASH BHILAVEKAR	UPDT	ROYAL SECURITY& LABOUR ORGANISATION		
324	1000005862	UMESH BHAI LAXMAN BHAI VASAVA	UPDT	ROYAL SECURITY& LABOUR ORGANISATION		
325	1000005867	Rahulbhai mukeshbhai	UPDT	ROYAL SECURITY& LABOUR ORGANISATION		
326	1000010175	RAJKUMAR MOHLAL MAVSKAR	UPDT	ROYAL SECURITY& LABOUR ORGANISATION		
327	1000010178	ASHARAM PATIRAM KASDEKAR	UPDT	ROYAL SECURITY& LABOUR ORGANISATION		
328	1000001804	BRAJLAL KASDE	ACROLEIN	ROYAL SECURITY& LABOUR ORGANISATION		
329	1000002798	DIPAK YADAV	ACROLEIN	ROYAL SECURITY& LABOUR ORGANISATION		
330	1000009524	NILESH JAMUKAR	ACROLEIN	ROYAL SECURITY& LABOUR ORGANISATION		
331	1000006841	DHARM SINGH SATHE	ACROLEIN	ROYAL SECURITY& LABOUR ORGANISATION		
332	1000002434	NEHRU LAL KAJLE	ANTRACOL	ROYAL SECURITY& LABOUR ORGANISATION		
333	1000004008	RAMAKANT DEVEDI	ANTRACOL	ROYAL SECURITY& LABOUR ORGANISATION		
334	1000009310	RAMESHWAR HIRALAL	ANTRACOL	ROYAL SECURITY& LABOUR ORGANISATION		
335	1000002563	SARVESH KUMAR	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
336	1000002566	GHANSHYAM SAKHARAM	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
337	1000003710	SHRI KISHAN	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
338	1000003965	MANOJ KUMAR	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		

339	1000006715	CHANDAN GAUTAM	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
340	1000007533	RAMSHARAN YADAV	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
341	1000007875	PRAVIN PREJAPATI	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
342	1000007885	RAMLAL CHOTELAL JAMBEKAR	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
343	1000007984	ARUNEESH RAWAT	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
344	1000009062	GYANI SUKURU KOL	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
345	1000009348	PRAKASH PREMLAL CHATURKAR	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
346	1000009975	DEEPU KUMAR SURSH	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
347	1000010736	CHANDR PRAKASH RAM PRASAD	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
348	1000011131	RAJU KUSHWAHA	POWER PLANT	ROYAL SECURITY& LABOUR ORGANISATION		
349	1000003280	DINESH KUMSR	CM 257	ROYAL SECURITY& LABOUR ORGANISATION		
350	1000007766	KENDE SIRALE	CM 257	ROYAL SECURITY& LABOUR ORGANISATION		
351	1000007901	SUNIL SABULAL CHATUR	CM 257	ROYAL SECURITY& LABOUR ORGANISATION		
352	1000007903	GANGAPRASAD MOTILAL	CM 257	ROYAL SECURITY& LABOUR ORGANISATION		
353	1000007906	KUVARLAL KOMAL KASDEKAR	CM 257	ROYAL SECURITY& LABOUR ORGANISATION	Not found	
354	1000007907	MANIRAM SANTULAL DHIKARE	CM 257	ROYAL SECURITY& LABOUR ORGANISATION	Not found	
355	1000007909	SUKHDEV SABULAL CHATUR	GF-1	ROYAL SECURITY& LABOUR ORGANISATION		
356	1000007969	KAMAL LAXMAN PANSE	CM 257	ROYAL SECURITY& LABOUR ORGANISATION	Not found	
357	1000009020	INDRAPAL SINGH YADAV	CM 257	ROYAL SECURITY& LABOUR ORGANISATION		
358	1000001403	RAJESH PAL	UPF-35	S.P.S Enterprises		
359	1000003627	SURESH PAL	UPF-35	S.P.S Enterprises		
360	1000003700	SUKHDEV PRAJAPATI	UPF-35	S.P.S Enterprises		
361	1000003720	KAPIL JATAV	UPI-14	S.P.S Enterprises		
362	1000003897	YASHPAL PAL	UPF-35	S.P.S Enterprises		
363	1000004947	ROHIT KUMAR	UPI-14	S.P.S Enterprises		
364	1000006085	DINESH PAL	UPI-14	S.P.S Enterprises		
365	1000006066	GAJENDRA PAL	UPF-35	S.P.S Enterprises		
366	1000006071	SUKHDEV LODHI	UPF-35	S.P.S Enterprises		
367	1000006097	RAHUL PAL	UPF-35	S.P.S Enterprises		
368	1000006102	DEVSINGH BAGHEL	UPF-35	S.P.S Enterprises		
369	1000006622	INDARPAL	UPF-35	S.P.S Enterprises		
370	1000009063	ASHIQ LODHI	UPF-35	S.P.S Enterprises		
371	1000010173	DHARMVEER SHARMA	UPF-35	S.P.S Enterprises		
372	1000010174	LALCHAND PAL	UPF-35	S.P.S Enterprises		
373	1000010915	CHANDAN KUMAR	UPF-35	S.P.S Enterprises		
374	1000001404	KALIDAS MELA VASAVA	MANCOZEB	Dilip & Company		
375	1000001447	KAMLESH NATVAR VASAVA	UPF-35	Dilip & Company		
376	1000001457	DINESH BUAL VASAVA	MANCOZEB	Dilip & Company		
377	1000001458	RAJUBHAI SEVAK VASAVA	UPF-35	Dilip & Company		
378	1000001477	LALU ISHWAR VASAVA	MANCOZEB	Dilip & Company		
379	1000001489	BALU RAVJIBHAI VASAVA	PCL3	Dilip & Company		
380	1000001490	SANJAY BHARMAL VASAVA	ETP	Dilip & Company		
381	1000001507	DAUD MATHUR VASAVA	Q.A.	Dilip & Company		
382	1000001540	PARESH JIVA VASAVA	UPF-35	Dilip & Company		
383	1000001545	GANESH SOMA VASAVA	MANCOZEB	Dilip & Company		
384	1000001552	VASAVA GANESHBHAI ARJUNBHAI	UPF-35	Dilip & Company		
385	1000001554	VASAVA AAKASHBHAI JASHAVANTBHAI	UPF-35	Dilip & Company		
386	1000001558	VASAVA VIPULKUMAR VIJAYBHAI	UPF-35	Dilip & Company		
387	1000001573	VASAVA FATESING IESANG	ETP	Dilip & Company		
388	1000001590	VASAVA ASHOKBHAI SHANTILALBHAI	UPF-35	Dilip & Company		
389	1000002791	VASAVA VIKRAMBHAI	MANCOZEB	Dilip & Company		
390	1000003271	JAYESH KUMAR	PCL3	Dilip & Company		
391	1000003610	VISHAL BHAI VASAVA	ETP	Dilip & Company		
392	1000005121	SHAILESHBHAI SHUKABHAI VASAVA	PCL3	Dilip & Company		
393	1000010701	SHUKALBHAI	ADMIN	Dilip & Company		
394		VIJAY B	PCL3	Dilip & Company		
395	1000006245	MAHENDRA HATE	SE 367	MAA NARMADA ENGINEERINGS		
396	1000009333	AKHILESH KUMAR	SE 367	MAA NARMADA ENGINEERINGS		
397	1000009335	VISHRAM	SE 367	MAA NARMADA ENGINEERINGS		
398	1000010181	DINOO OM PRAKASH	SE 367	MAA NARMADA ENGINEERINGS		
399	1000001936	SUNIL	GF-3	MAA NARMADA ENGINEERINGS		
400	1000001972	ANURAG NISHAD	GF-3	MAA NARMADA ENGINEERINGS		
401	1000002073	LAVKUSH PRAJAPATI	GF-3	MAA NARMADA ENGINEERINGS		
402	1000006494	AMIT KUMAR RAM KAILASH	GF-3	MAA NARMADA ENGINEERINGS		
403	1000006499	RAMKUMAR DULARE	GF-3	MAA NARMADA ENGINEERINGS		
404	1000006511	JANAKI	GF-3	MAA NARMADA ENGINEERINGS		
405	1000006538	RAJENDARA RAM KUMAR YADAV	GF-3	MAA NARMADA ENGINEERINGS		
406	1000006787	VISHAL MEVA LAL	GF-3	MAA NARMADA ENGINEERINGS		

407	1000006788	VIJAY BHAGVANDEEN	GF-3	MAA NARMADA ENGINEERINGS			
408	1000007602	KAILASH SINGH	GF-3	MAA NARMADA ENGINEERINGS			
409	1000007856	RAVENDRA SINGH GOND	GF-3	MAA NARMADA ENGINEERINGS			
410	1000007857	AKHENDRA SINGH	GF-3	MAA NARMADA ENGINEERINGS			
411	1000007879	BALVEER SINGH	GF-3	MAA NARMADA ENGINEERINGS			
412	1000011238	AKASH YADAV	GF-3	MAA NARMADA ENGINEERINGS			
413	1000011239	RAJENDRA PAL	GF-3	MAA NARMADA ENGINEERINGS			
414	1000011449	AFSAR YADAV	GF-3	MAA NARMADA ENGINEERINGS			
415	1000007586	SURAJKUMAR KANAIYALAL	UPI-14	MAA NARMADA ENGINEERINGS			
416	1000003528	SHAILESH MANSANGBHAI VASAVA	ETP	MAA NARMADA ENGINEERINGS			
417	1000007559	VASAVA BHARAT KARANSINGH	MR 205	MAA NARMADA ENGINEERINGS		Indoor	Jayaben
418	1000007787	AJAY HENIYABHAI VASAVA	MR 205	MAA NARMADA ENGINEERINGS			
419	1000001927	SOURABH SINGH	GF-2	MAA NARMADA ENGINEERINGS			
420	1000003336	TULARAM YADAV	GF-2	MAA NARMADA ENGINEERINGS			
421	1000003682	RAKESH RATHOD	GF-2	MAA NARMADA ENGINEERINGS			
422	1000003683	ABHIJEET MAHESH PRASAD	GF-2	MAA NARMADA ENGINEERINGS			
423	1000003685	MAN SINGH	GF-2	MAA NARMADA ENGINEERINGS			
424	1000003687	MANGAL SINGH	GF-2	MAA NARMADA ENGINEERINGS		Indoor	Jayaben
425	1000004941	GOPAL NATURAM	GF-2	MAA NARMADA ENGINEERINGS			
426	1000005423	VASAVA VIRENDRABHAI VINODBHAI	GF-2	MAA NARMADA ENGINEERINGS			
427	1000006512	KANDHAI MITTHU	GF-2	MAA NARMADA ENGINEERINGS			
428	1000006785	RAINISH KUMAR	GF-2	MAA NARMADA ENGINEERINGS		Outdood	Jayaben
429	1000006786	BAL GOVIND MEVA LAL	GF-2	MAA NARMADA ENGINEERINGS			
430	1000006789	RITESH RANVEER	GF-2	MAA NARMADA ENGINEERINGS			
431	1000006993	SANJAY VANSHAKAR	GF-2	MAA NARMADA ENGINEERINGS			
432	1000007000	ABHISHEK SEN	GF-2	MAA NARMADA ENGINEERINGS			
433	1000007586	NEELESH VEER SING YADAV	GF-2	MAA NARMADA ENGINEERINGS			
434	1000007588	VINOD RAM MILAN YADAV	GF-2	MAA NARMADA ENGINEERINGS			
435	1000007563	VASAVA KANAIYABHAI	GF-2	MAA NARMADA ENGINEERINGS			
436	1000007585	SANDIP KUMAR VASAVA	GF-2	MAA NARMADA ENGINEERINGS			
437	1000007865	MULAYAM SINGH KADHI	GF-2	MAA NARMADA ENGINEERINGS			
438	1000010918	UTTAM RAKESH	GF-2	MAA NARMADA ENGINEERINGS			
439	1000010980	VINOD VANSHKAR	GF-2	MAA NARMADA ENGINEERINGS			
440	1000007708	VASAVA VINOD BHAI KANTIBHAI	UPDT	MAA NARMADA ENGINEERINGS			
441	1000010183	SHIVKUMAR JASKARAN	UPDT	MAA NARMADA ENGINEERINGS			
442	1000010184	RAVIRAJ CHOTELAL	UPDT	MAA NARMADA ENGINEERINGS			
443	1000006198	KALIDEEN HAJARI	UPI-12 MEE	MAA NARMADA ENGINEERINGS			
444	1000006250	VINOD KUMAR RAMESHWAR	UPI-12 MEE	MAA NARMADA ENGINEERINGS			
445	1000006478	NARENDRA KUMAR GANGARAM	UPI-12 MEE	MAA NARMADA ENGINEERINGS			
446	1000006598	SUNIL KUMAR	UPI-12 MEE	MAA NARMADA ENGINEERINGS			
447	1000001920	SATYA BEER	ACEPHATE	MAA NARMADA ENGINEERINGS			
448	1000001998	SUKHDEEN	ACEPHATE	MAA NARMADA ENGINEERINGS			
449	1000006339	RAM BARAN	ACEPHATE	MAA NARMADA ENGINEERINGS			
450	1000006595	AMAR CHANDRA	ACEPHATE	MAA NARMADA ENGINEERINGS			
451	1000006603	SHIV KUMAR	ACEPHATE	MAA NARMADA ENGINEERINGS			
452	1000006739	ROHIT PRAJAPATI	ACEPHATE	MAA NARMADA ENGINEERINGS			
453	1000007509	NITESH RAMKISHAN PRAJAPATI	ACEPHATE	MAA NARMADA ENGINEERINGS			
454	1000002617	MURAT SINGH	TEP	MAA NARMADA ENGINEERINGS			
455	1000003549	FUL SINGH	TEP	MAA NARMADA ENGINEERINGS			
456	1000005037	JAYNDRABHAI RATANBHAI VASAVA	TEP	MAA NARMADA ENGINEERINGS			
457	1000005873	Vijaybhai Dhanpalbhai	TEP	MAA NARMADA ENGINEERINGS			
458	1000006336	ABHISEK SINGH	TEP	MAA NARMADA ENGINEERINGS			
459	1000006612	RAM BABU	TEP	MAA NARMADA ENGINEERINGS			
460	1000007806	KISHORBHAI VASAVA	TEP	MAA NARMADA ENGINEERINGS			
461	1000007809	AJAY SINGH	TEP	MAA NARMADA ENGINEERINGS			
462	1000010713	PRATAP SINGH PAL	TEP	MAA NARMADA ENGINEERINGS			
463	1000011221	SHAILANDRA YADAV	TEP	MAA NARMADA ENGINEERINGS			
464	1000011222	RAVIKUMAR	TEP	MAA NARMADA ENGINEERINGS			
465	1000011324	AKHILESH RAMCHANDRA	TEP	MAA NARMADA ENGINEERINGS			
466	1000011442	PAWAN YADAV	TEP	MAA NARMADA ENGINEERINGS			
467	1000002506	ALOK KUMAR RAM PRAKASH	NASH	MAA NARMADA ENGINEERINGS			
468	1000003514	NITESHBHAI RATANBHAI	NASH	MAA NARMADA ENGINEERINGS			
469	1000011108	ARVIND	NASH	MAA NARMADA ENGINEERINGS			
470	1000011109	SONU RAJPOOT	NASH	MAA NARMADA ENGINEERINGS			
471	1000001987	MANIRAM	CS2	MAA NARMADA ENGINEERINGS			
472	1000007589	DHUP SINGH	CS2	MAA NARMADA ENGINEERINGS			
473	1000002103	DHARMEN PAL	MANCOZEB	POONAM ENTERPRISE			
474	1000002122	MANESH RAM DEV	GF-2	POONAM ENTERPRISE			

475	1000002146	RAMMILAN	MANCOZEB	POONAM ENTERPRISE			
476	1000002147	BHARATKUMAR PAL	GF-1	POONAM ENTERPRISE			
477	1000002150	PRAMOD KUMAR PAL	UPI-12 MEE	POONAM ENTERPRISE			
478	1000002152	SHRI RAM PAL	GF-1	POONAM ENTERPRISE			
479	1000002172	RAKESH BABU	UPH 5000	POONAM ENTERPRISE			
480	1000002204	ROOPCHAND	UPI-12 MEE	POONAM ENTERPRISE			
481	1000002205	LALLAN KUMAR	UPI-12 MEE	POONAM ENTERPRISE			
482	1000002212	VIRENDRA PAL	MANCOZEB	POONAM ENTERPRISE			
483	1000002234	AMARNATH	UPH 5000	POONAM ENTERPRISE			
484	1000002338	DHARVENDRA	GF-1	POONAM ENTERPRISE			
485	1000003265	OHHOTOD	UPH 5000	POONAM ENTERPRISE			
486	1000003267	AKLESH PAL	UPH 5000	POONAM ENTERPRISE			
487	1000003428	SANTOSH KUMAR	GF-3	POONAM ENTERPRISE			
488	1000003672	SHRI PRASAD	ANTRACOL	POONAM ENTERPRISE			
489	1000003677	SURENDRA PRASAD	GF-3	POONAM ENTERPRISE		Outdoor	Jayaben
490	1000003753	VIVEK PARIHAR	GF-1	POONAM ENTERPRISE			
491	1000006009	CHANDRABAN	GF-1	POONAM ENTERPRISE			
492	1000006040	ROHIT	UPH 5000	POONAM ENTERPRISE			
493	1000006190	RAJESH PAL	UPH 5000	POONAM ENTERPRISE			
494	1000006191	LALLULAL PAL	ANTRACOL	POONAM ENTERPRISE			
495	1000006303	PRADEEP KUMAR	MANCOZEB	POONAM ENTERPRISE			
496	1000006305	RAM KAMAL	UPH 5000	POONAM ENTERPRISE			
497	1000006440	MAHESH SINGH GOND	UPI-14	POONAM ENTERPRISE			
498	1000006467	MOHIT	WARE HOUSE	POONAM ENTERPRISE			
499	1000006468	CHANDRA BHAN	UPH 5000	POONAM ENTERPRISE			
500	1000006559	ANUJ KUMAR PAL	ANTRACOL	POONAM ENTERPRISE			
501	1000006725	PARSOTAM SEN	GF-1	POONAM ENTERPRISE			
502	1000006743	ANAND KUMAR PAL	MANCOZEB	POONAM ENTERPRISE			
503	1000006806	MANGAL SINGH	CM 257	POONAM ENTERPRISE		Inddor	Healing
504	1000006987	NAND BHAEYA PAL	UPH 5000	POONAM ENTERPRISE			
505	1000007054	BRAJESH PAL	CM 257	POONAM ENTERPRISE			
506	1000007228	DHEERAJ SINGH	UPI-14	POONAM ENTERPRISE			
507	1000007297	RAUSHAN KUMAR	CM 257	POONAM ENTERPRISE		Indoor	Jayaben
508	1000007773	SANJAY KUMAR PAL	UPH 5000	POONAM ENTERPRISE			
509	1000007964	RAVINDRA PARIHAR	GF-1	POONAM ENTERPRISE			
510	1000007967	BALBIR PARIHAR	GF-1	POONAM ENTERPRISE		Indoor	Jayaben
511	1000009805	OMSARAN KESHAV DAYAL	GF-1	POONAM ENTERPRISE			
512	1000009306	YATESH KUMAR RAJENDRA SINGH	GF-1	POONAM ENTERPRISE			
513	1000009336	UMESH KUSHWAH	CM 257	POONAM ENTERPRISE			
514	1000009338	ABHISHEK KUSHWAH	CM 257	POONAM ENTERPRISE			
515	1000009354	MONU PARIHAR	GF-1	POONAM ENTERPRISE			
516	1000009581	PUSHPRAJ SINGH GOND	UPI-14	POONAM ENTERPRISE			
517	1000009608	ANIL KUMAR	GF-1	POONAM ENTERPRISE			
518	1000010504	MILAP SINGH RAMSEVAK	GF-2	POONAM ENTERPRISE			
519	1000011245	JAMUNA MITHAI PRASAD	CM 257	POONAM ENTERPRISE			
520	1000011247	RAJBAN GADARIYA	PROJECT	POONAM ENTERPRISE			
521	1000011430	RAJ SINGH	UPH 5000	POONAM ENTERPRISE			
522	1000002253	SHIV NATH	UPF-35	GAYATRI HELPER SUPPLIERS			
523	1000002254	BABULAL	UPF-35	GAYATRI HELPER SUPPLIERS			
524	1000002257	DIPAK KUMAR	TEP	GAYATRI HELPER SUPPLIERS			
525	1000002263	BIRENDRA AY	UPF-35	GAYATRI HELPER SUPPLIERS			
526	1000002266	SANJAY KUMAR	UPF-35	GAYATRI HELPER SUPPLIERS			
527	1000002335	BALRAM	MANCOZEB	GAYATRI HELPER SUPPLIERS			
528	1000002653	RAM NARESH	UPF-35	GAYATRI HELPER SUPPLIERS			
529	1000002752	SURENDRA	MANCOZEB	GAYATRI HELPER SUPPLIERS			
530	1000003307	RAMHET	UPF-35	GAYATRI HELPER SUPPLIERS			
531	1000003330	DESRAJ	MANCOZEB	GAYATRI HELPER SUPPLIERS			
532	1000003331	RAJESH PAL	MANCOZEB	GAYATRI HELPER SUPPLIERS			
533	1000003338	SATISH PAARIHAR	UPF-35	GAYATRI HELPER SUPPLIERS			
534	1000003374	RAMPRAVESH GUPTA	UPF-35	GAYATRI HELPER SUPPLIERS			
535	1000003432	RAJABABU YADAV	MANCOZEB	GAYATRI HELPER SUPPLIERS			
536	1000003495	DEVRAJ KUMAR	UPF-35	GAYATRI HELPER SUPPLIERS			
537	1000003496	DHANJAY KUMAR	UPF-35	GAYATRI HELPER SUPPLIERS			
538	1000004666	RAVI KUMAR	MANCOZEB	GAYATRI HELPER SUPPLIERS			
539	1000006232	UMESH	TEP	GAYATRI HELPER SUPPLIERS			
540	1000006234	JAY KARAN SINGH	MANCOZEB	GAYATRI HELPER SUPPLIERS			
541	1000007048	AMIT KUMAR	MANCOZEB	GAYATRI HELPER SUPPLIERS			
542	1000007199	AJAYBHAI VASAVA	MANCOZEB	GAYATRI HELPER SUPPLIERS			

543	1000007535	KUNDAN KUMAR RAM	UPF-35	GAYATRI HELPER SUPPLIERS			
544	1000007778	SUKHAVENDRA	UPF-35	GAYATRI HELPER SUPPLIERS			
545	1000010710	BRAJPAL	MANCOZEB	GAYATRI HELPER SUPPLIERS			
546	1000011124	BHOLA MANDAL	UPF-35	GAYATRI HELPER SUPPLIERS			
547	1000011402	MUNNA KUMAR	UPF-35	GAYATRI HELPER SUPPLIERS			
548	1000002454	JAY PRAKASH	CCP	UMA ENGINEERING			
549	1000002468	shahikantbhai	CCP	UMA ENGINEERING			
550	1000005965	LAD HARIKRUSHNA ANILBHAI	MAINTENANCE	UMA ENGINEERING			
551	1000007063	VIKRAM KUMAR YADAV	MAINTENANCE	UMA ENGINEERING			
552	1000007064	RAJENDRA SINGH	MAINTENANCE	UMA ENGINEERING			
553	1000007066	MAHESH KUMAR SANTOSH	MAINTENANCE	UMA ENGINEERING			
554	1000007067	IQBALBHAI SHEKH	MAINTENANCE	UMA ENGINEERING			
555	1000007074	YATISH L PATEL	MAINTENANCE	UMA ENGINEERING			
556	1000007083	SANTLAL NISHAD	MAINTENANCE	UMA ENGINEERING			
557	1000007084	GAURAV KUMAR	MAINTENANCE	UMA ENGINEERING			
558	1000007085	PAWAN THAKUR	MAINTENANCE	UMA ENGINEERING			
559	1000007088	SUMIT KUMAR	MAINTENANCE	UMA ENGINEERING			
560	1000007090	DEVENDRA P PATIL	MAINTENANCE	UMA ENGINEERING			
561	1000007094	SUBHASH PAL	MAINTENANCE	UMA ENGINEERING			
562	1000007125	SUNIL KUMAR YADAV	MAINTENANCE	UMA ENGINEERING			
563	1000007126	GOSAI ATULPURI	MAINTENANCE	UMA ENGINEERING			
564	1000007130	HARIVANSH KUMAR BHARTI	MAINTENANCE	UMA ENGINEERING			
565	1000007143	KANHAI KUMAR MAHTO	MAINTENANCE	UMA ENGINEERING			
566	1000007148	ARJUN YADAV	MAINTENANCE	UMA ENGINEERING			
567	1000007150	HINELKUMAR B VASAVA	MAINTENANCE	UMA ENGINEERING			
568	1000007191	UMASHANKAR PRASAD	MAINTENANCE	UMA ENGINEERING			
569	1000007205	sonu kumar gupta	MAINTENANCE	UMA ENGINEERING			
570	1000007208	BIPIN BIHARI CHAUHAN	MAINTENANCE	UMA ENGINEERING			
571	1000007212	MADAN PASWAN	MAINTENANCE	UMA ENGINEERING			
572	1000007216	SAVAILYA MADHAVBHAI	MAINTENANCE	UMA ENGINEERING			
573	1000007219	AMIRDEV YADAV	MAINTENANCE	UMA ENGINEERING			
574	1000007221	MAHESH KUMAR SHAH	MAINTENANCE	UMA ENGINEERING			
575	1000007222	VED VYAS KUMAR	MAINTENANCE	UMA ENGINEERING			
576	1000007223	BITU KUMAR MANDAL	MAINTENANCE	UMA ENGINEERING			
577	1000007225	NANDAN KUMAR	MAINTENANCE	UMA ENGINEERING			
578	1000007227	VIKRAMBHAI VASAVA	MAINTENANCE	UMA ENGINEERING			
579	1000007229	VIJAY KUMARMANDAL	MAINTENANCE	UMA ENGINEERING			
580	1000007235	PRAVINKUMAR THAKUR	MAINTENANCE	UMA ENGINEERING			
581	1000007446	SHRIKRUSHNA VASANT PATEL	MAINTENANCE	UMA ENGINEERING			
582	1000007616	RANDHIR KUMAR	MAINTENANCE	UMA ENGINEERING			
583	1000007810	KAILASH PATI	MAINTENANCE	UMA ENGINEERING		Indoor	Jayaben
584	1000007914	PATEL HITESHBHAI ARVINDBHAI	MAINTENANCE	UMA ENGINEERING			
585	1000010505	VRIVESH KUMAR RAI	MAINTENANCE	UMA ENGINEERING			
586	1000010697	PATEL YASH KUMAR	MAINTENANCE	UMA ENGINEERING			
587	1000010893	ALOK KUMAR SHIVRAJ SINGH	MAINTENANCE	UMA ENGINEERING			
588	1000001846	MUKUND RAM	SECURITY	R.S. Security			
589	1000001856	NARESH KUMAR DUBEY	SECURITY	R.S. Security			
590	1000001860	SATISH	SECURITY	R.S. Security			
591	1000001873	AMIT KUMAR CHOUHAN	SECURITY	R.S. Security			
592	1000001884	RINKESH KUMAR	SECURITY	R.S. Security			
593	1000001887	CHOTE LAL YADAV	SECURITY	R.S. Security			
594	1000001888	SANJAY YADAV	SECURITY	R.S. Security			
595	1000001896	AJAY TIWARI	SECURITY	R.S. Security			
596	1000001900	DAYA SHANKAR SINGH	SECURITY	R.S. Security			
597	1000002626	SHIVPAL	SECURITY	R.S. Security			
598	1000002743	DEVI LAL	SECURITY	R.S. Security			
599	1000003279	SHRAWAN KUMAR RANWA	SECURITY	R.S. Security			
600	1000003312	BHARAT KUMAR PATHAK	SECURITY	R.S. Security			
601	1000003793	MUKESH KUMAR	SECURITY	R.S. Security			
602	1000004660	RAM HARAK	SECURITY	R.S. Security			
603	1000005938	PRAVINSINGH	SECURITY	R.S. Security			
604	1000005984	AMAR SINGH YADAV	SECURITY	R.S. Security			
605	1000006705	NARAYAN SINGH	SECURITY	R.S. Security			
606	1000006994	PARVAT SINGH	SECURITY	R.S. Security			
607	1000007195	PAWAN KASHAYAP	SECURITY	R.S. Security			
608	1000007300	RAM CHANDRA BHAMU	SECURITY	R.S. Security			
609	1000007323	MAHENDER SINGH DUL SINGH	SECURITY	R.S. Security			
610	1000007380	JITENDRA SINGH SHEKHAWAT	SECURITY	R.S. Security			

611	1000007500	BAHADURSING BAVA VASAVA	SECURITY	R.S. Security			
612	1000007501	JAY KARAN	SECURITY	R.S. Security			
613	1000007530	RAGHVENDRA SINGH TOMAR	SECURITY	R.S. Security			
614	1000007814	RAVINDRA SINGH RAJAWAT	SECURITY	R.S. Security			
615	1000007880	DEEPCHAND	SECURITY	R.S. Security			
616	1000007881	BRAJESH SINGH NATHU SINGH	SECURITY	R.S. Security			
617	1000007883	BANKE BIHARI	SECURITY	R.S. Security			
618	1000007954	UPENDRA SINGH SENGAR	SECURITY	R.S. Security			
619	1000011293	VIJENDRA SINGH	SECURITY	R.S. Security			
620	1000009923	RAKESH KUMAR TIWARI	SECURITY	Escort Security & Personnel Services			
621	1000004680	Raghvendra Singh	SECURITY	Escort Security & Personnel Services			
622	1000005462	AKASH SINGH	SECURITY	Escort Security & Personnel Services			
623	1000007340	DHANANJAY RAJBHAR	SECURITY	Escort Security & Personnel Services			
624	1000007712	RAJENDRA KUMAR	SECURITY	Escort Security & Personnel Services			
625	1000007987	VIJAY KUMAR KAMAL SINGH	SECURITY	Escort Security & Personnel Services			
626	1000009036	HEMRAJ	SECURITY	Escort Security & Personnel Services			
627	1000011525	MOHAN TIWARI	SECURITY	Escort Security & Personnel Services			
628	1000004659	BHUPENDRA PATEL	SAFETY	CATALYSTS			
629	1000004963	PINTU CHATURVEDI	SAFETY	CATALYSTS			
630	1000002861	KIRIT RATHOD	WARE HOUSE	Randstad India Private Limited			
631	1000002865	SUNIL PATEL	SAFETY	Randstad India Private Limited			
632	1000002871	SANJAY R VASAVA	ELECTRICAL	Randstad India Private Limited			
633	1000002873	AJAY VANKAR	SAFETY	Randstad India Private Limited			
634	1000002874	MANISH S VASAVA	SAFETY	Randstad India Private Limited			
635	1000002940	JITENDRA VASAVA	SAFETY	Randstad India Private Limited			
636	1000002966	CHIRAG PATEL	ELECTRICAL	Randstad India Private Limited			
637	1000002969	RAMESH KARGATIYA	SAFETY	Randstad India Private Limited			
638	1000003000	AMAR RAY	SAFETY	Randstad India Private Limited			
639	1000003006	RASIDKHAN PATHAN	SAFETY	Randstad India Private Limited			
640	1000003517	PRAJAPATI ASHISH JITESHBHAI	ELECTRICAL	Randstad India Private Limited			
641	1000004777	MANGAL SINGH	WARE HOUSE	Randstad India Private Limited			
642	1000004797	PATEL RUDRAKUMAR BHUPENDRABHAI	ACEPHATE	Randstad India Private Limited			
643	1000004798	PATEL NIRMALKUMAR JAYSINH	ACEPHATE	Randstad India Private Limited			
644	1000004799	PARMAR MAYANKKUMAR MAHENDRABHAI	ACEPHATE	Randstad India Private Limited			
645	1000006400	Vasava Kalpesh Kanjibhai	SAFETY	Randstad India Private Limited			
646	1000006642	DHRUVILKUMAR PATEL	SAFETY	Randstad India Private Limited			
647	1000006816	RAHUL VASAVA	SAFETY	Randstad India Private Limited			
648	1000006980	SAVANIYA SANDIP BATUKBHAI	SAFETY	Randstad India Private Limited			
649	1000007183	SONAR SANDIP BIMALPRASAD	MAINTENANCE	Randstad India Private Limited			
650		Nagmani Singh				Outdoor	Jayaben
651		Deepak Kumar Singh	C O	Staff		Outdoor	Jayaben
652		Ashok Shatrughan				Outdoor	Jayaben
653		Pradeep Singh	C O	Staff		Outdoor	Jayaben
654		Nilesh Patel				Outdoor	Jayaben
655		Gitanshu Patel				Outdoor	Jayaben

655
Job work 82
(Trap) Driver 74
811

Annexure - 6: Closure Order/ Prohibition Order under Section 40(2) of The Factory Act 1948 by DISH

કમાંક:ડેડીઆઇએસએચ/ભરૂચ/૨૦૨૧/ ૨૦૨
ડેપ્યુટી ડાયરેકટર ઇન્ડસ્ટ્રીયલ સેફટી એન્ડ હેલ્થ,
બીજો માળ, બહુમાળી મકાન, ગાયત્રીનગર સામે,
કણબીવગા, ભરૂચ.
તા.૨૩/૦૨/૨૦૨૧

પ્રતિ,
કબ્જેદારશ્રી/વ્યવસ્થાપકશ્રી,
યુ.પી.એલ.લિમિટેડ (યુનિટ -૫)
પ્લોટ નં -૭૪૬/૭૫૦,
જીઆઇડીસી ઝગડીયા ,
તા ઝગડીયા , જી:ભરૂચ

વિષય : કારખાના અધિનિયમ-૧૯૪૮ ની કલમ ૪૦(૨) હેઠળ લેખિત હુકમ

(1) કારખાનામાં તા. ૨૩/૦૨/૨૦૨૧ નાં રોજ સમય વહેલી સવારે ૦૧.૪૫ કલાકે કારખાનાના સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુકોસિનેટ પ્લાન્ટ)માં એકસપ્લોઝન સાથે ફાયર ના બનાવ ને લીધે પ્રાણઘાતક અકસ્માતની ઘટના બનેલ જે બાબતે તા. ૨૩/૦૨/૨૦૨૧ નાં રોજ રાત્રિના ૦૨.૪૫ કલાકે શ્રી વાય.એમ.પટેલ ,મદદનીશ નિયામક , ઔદ્યોગિક સલામતી અને સ્વાસ્થ્ય ,ભરુચ ની સાથે નીચે સહી કરનારે કારખાનાની મુલાકાત લીધી.

(2) કારખાના માં આવેલા સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુકોસિનેટ પ્લાન્ટ)માં તા. ૨૩/૦૨/૨૦૨૧ નાં રોજ સમય વહેલી સવારે ૦૧.૪૫ કલાકે અચાનક એકસપ્લોઝન સાથે ફાયર ના બનાવને લીધે શ્રમયોગીશ્રી વનરાજસિંહ ડોડિયા અને શ્રી નેહલ મેહતાનુ સ્થળ પર અવસાન થયેલ છે તથા ૧૯ શ્રમયોગીઓને અલગ અલગ પ્રકારની ઇન્જરી થયેલ હતી. આથી ૧૭ શ્રમયોગીઓને જયાબેન મોદી હોસ્પિટલ ,અંકલેશ્વર ખાતે સારવાર અર્થે દાખલ કરેલ તેમાંથી ૧૦ શ્રમયોગીઓને તા. ૨૩/૦૨/૨૧ ના રોજ બપોરે ૦૨.૦૦ કલાક સુધીમાં સારવાર આપીને રજા આપવામાં આવેલ છે અને ૦૭ શ્રમયોગીઓ ત્યાં સારવાર હેઠળ છે તથા ૦૨ શ્રમયોગીઓને હિલીંગ ટચ હોસ્પિટલ ,ભરુચ ખાતે સારવાર અર્થે દાખલ કરેલ છે. તથા હેડ કાઉન્ટ કંપની દ્વારા કરવામાં આવતા ૦૫ શ્રમયોગીઓ મિસિંગ છે. કારખાનાના સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુકોસિનેટ પ્લાન્ટ)માં એકસપ્લોઝન સાથે ફાયર ના બનાવ ને લીધે ભારે નુકશાન થયેલુ જણાય છે તથા તેનો કંટ્રોલ રુમ, MEE પ્લાન્ટ માં ભારે સ્ટ્રકચરલ ડેમેજ થયેલ છે. સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુકોસિનેટ પ્લાન્ટ)ના મેઇન પ્લાન્ટ , રિકવરી સેક્શન તથા MCC રૂમમાં તથા વેરહાઉસ ને ભારે સ્ટ્રકચરલ નુકશાન થયેલુ જણાય છે તેમજ આ એકસપ્લોઝનને લીધે કારખાનાની પ્રિમાઇસીસના અન્ય તમામ પ્લાન્ટના એન્જીનીયરીંગ કન્સટ્રકશનની મજબુતાઇ ને પણ અસર થયેલ છે.

આમ, કારખાનામાં સદરહુ એકસપ્લોઝનના બનાવના કારણે શ્રમયોગી વનરાજસિંહ ડોડિયા અને શ્રી નેહલ મેહતાનુ અવસાન થયેલ છે. આમ, સદર અકસ્માતને કારણે સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુકોસિનેટ પ્લાન્ટ) સહિત કારખાનાના તમામ પ્લાન્ટ ચાલુ રાખવામાં આવે/ઉપયોગમાં લેવામાં આવે તો મનુષ્યની જીંદગીને તાત્કાલિક જોખમ ઊભુ થાય તેમ છે. આથી હુ શ્રી એન.ડી.વાઘેલા, કારખાનાધારા-૧૯૪૮ની કલમ-૮ હેઠળ નીમાયેલ કારખાના નિરીક્ષક/ડેપ્યુટી ડાયરેકટર, ઇન્ડસ્ટ્રીયલ સેફટી એન્ડ હેલ્થ, ભરૂચ, કારખાનાધારા ની કલમ-૪૦(૨) હેઠળ ——— નીચે જણાવેલ સલામતીનાં સુચનોનું પાલન ના થાય ત્યા સુધી કારખાનાના સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુકોસિનેટ પ્લાન્ટ) સહિત કારખાનાના તમામ પ્લાન્ટ નો ઉત્પાદન પ્રક્રિયામાં ઉપયોગ કરવા પર પ્રતિબંધ ફરમાવુ છું.

સુચન -૦૧ કારખાના માં આવેલા સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુફોસિનેટ પ્લાન્ટ)માં એક્ષપ્લોઝન થવાના કારણે પ્લાન્ટના સ્ટ્રકચર ને એકસપ્લોઝનના વાઇબ્રેશન ની અસર થયેલ હોઇ સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુફોસિનેટ પ્લાન્ટ)ના ડેમેજ થયેલ સ્ટ્રકચરને સલામત રીતે નિષ્ણાંત વ્યક્તિના સુપરવિઝન હેઠળ દુર કરી, પુરતી મજબુતાઇનુ નવુ સ્ટ્રક્ચર બનાવી પ્લાન મંજુર કરાવી તમામ સ્ટ્રકચરો/ બિલ્ડીંગોનું સ્ટેબિલિટી સર્ટી. કોમ્પીટન્ટ પર્સન પાસેથી મેળવી રજુ કરવુ. .

સુચન -૦૨ કારખાના ના સી.એમ.પ્લાન્ટ (ક્લેથિડિયમ એન્ડ ગ્લુફોસિનેટ પ્લાન્ટ) સિવાયના અન્ય તમામ પ્લાન્ટોના એન્જીનીયરીંગ કન્સટ્રકશનને એકસપ્લોઝનના વાઇબ્રેશન ની અસર થયેલ હોઇ અન્ય તમામ પ્લાન્ટો ના સ્ટ્રકચરો/ બિલ્ડીંગોનું સ્ટેબિલિટી સર્ટી. કોમ્પીટન્ટ પર્સન પાસેથી મેળવી રજુ કરવુ

આ હુકમનો તાત્કાલિક અસરથી અમલ કરવા જણાવવામાં આવે છે. અને ઉપરોક્ત સુચનોનું પાલન કરી તેની જરૂરી આધાર પુરાવા સાથે નીચે સહિ કરનારને જાણ કરી લેખિત મંજુરી મેળવ્યા બાદ જ કારખાનામાં ઉત્પાદન પ્રક્રિયા શરૂ કરવી.

(3) સદરહુ અકસ્માત અંગેની વિગતવાર તપાસ નોંધ તપાસ પુર્ણ થયે આપવામાં આવશે.

(૪) વિઝીટબુક ફોર્મ નં 32 માં આ નોટિસ સંયુક્ત નિયામક (ઔ.સ.આરોગ્ય) શ્રી એસ. ગામણીયા સાહેબ અને આ.સ. ડાયરેક્ટર (કેમીકલ) શ્રી એ.કુ. વેકરીયા રૂબરૂ ચોટાડેલ છે.

સ્થળ :- ભરૂચ

તા:- ૨૩/૦૨/૨૦૨૧

(એન.ડી.વાઘેલા)
ડેપ્યુટી ડાયરેક્ટર,
ઇન્ડસ્ટ્રીયલ સેફટી એન્ડ હેલ્થ,
ભરૂચ.

નકલ રવાના:
(૧) ડાયરેકટરશ્રી, ઇન્ડસ્ટ્રીયલ સેફટી એન્ડ હેલ્થ, અમદાવાદ
(૨) જોઇન્ટ ડાયરેકટર, ઇન્ડસ્ટ્રીયલ સેફટી એન્ડ હેલ્થ, સુરત

For, UPL LIMITED UNIT-

Unit Head
(Anil Mundada)
FACTORY MANAGER

English Translation of Closure Order/ Prohibition Order by DISH

No. DDISH/BHARUCH/2021/502
Office of the Deputy Director Industrial Health & Safety
Second floor, Multistory building,
Opp. Gayatrinagar, Kanbivaga,
Bharuch .
Date: 23/02/2021

To,

Occuoier / Factory Manager,
U.P.L.Limited (Unit-5)
Plot No. 746 & 750,
Jhagadia-GIDC, Ta: Jhagadia,
Dist. Bharuch.

Subject: Written order under rule 40(2) under Factory Act, 1948.

1. In Factory on dt. 23/02/2021 at 1.45 hrs. early morning CM (Clathidium & Glufocinate plant) plant a fatal accident occurred of explosion with fire related to which undersigned visited at 02.45 hrs. night on 23/02/2021 along with Shri. Y.M.patel-Astt. Director Industrial Safety and Health, Bharuch.

2. In CM (Clathidium & Glufocinate plant) plant of the factory on Dt 23/02/2021 at 1.45 hrs. early morning accident of sudden explosion with fire occurred due to which worker Shri. Vanraj Dodiya and Shri Nehal Mehta died on the spot and nineteen workers were sustain various injuries. Hence seventeen workers were admitted for treatment in Jayaben Modi Hospital, Ankleshwar, out of which 10 workers were discharged till 02.00 hrs. of 23/02/2021 and other seven workers are under treatment and two other workers were admitted in Healing touch hospital Bharuch for further treatment. And during head counting done by Factory five workers were missing. In CM (Clathidium & Glufocinate plant) plant of the factory, due to this explosion with fire accident heavy loss has occurred and control room and heavy structural damage in MEE plant. Heavy structural damages has been observed in main plant of CM(Clathidium & Glufocinate plant) plant, recovery section and MCC room and in Ware house of the factory, moreover, this explosion has affected the factory premises and engineering construction of almost all plants.

   Thus , in factory due to the explosion accident, workers Shri. Vanraj Dodiya and Shri Nehal Mehta died. Since, in the light of this accident, it is dangerous and imminent danger to the human life to continue all the plants of the factory including CM(Clathidium & Glufocinate plant) plant of the factory, Hence forth I, Shri N.D.Vghela, nominated as Deputy Director Industrial Safety & Health, Bharuch, under Rule-8 of Factory Act, 1948 , on under prohibition order to stop the production of all the plants of the factory including CM (Clathidium & Glufocinate plant) plant of the factory further till to comply all safety guideline under rule 40(2) under Factory act, 1948.

Condition-1 Due to explosion in the CM (Clathidium & Glufocinate plant) plant of the factory, structure of the plant has affected due to vibrations of the explosion, so the removal of the damaged structure of the plant under supervision of the competent person and new structure to be constructed with sufficient strength and stability certificate obtain from competent person and same is to be submitted to DISH office.

Condition-2 , In the factory engineering structure of the other plants also affected due to vibration of the explosion, so structure stability certificate of all the building and plant structures with Competent person and submit the Structure stability certificate to DISH office.

It is informed hereby to comply the above order at the earliest and comply above guidelines and submit necessary evidences to undersigned in writing and there after plant production can be started.

3. Accident investigation report in detail shall be given after completion of investigation procedure.

4. In Visit book Form no.31 above remarks are attached in presence of Shri. S.C.bamaniya-Jt. Director-Industrial Safety & Health), Shri. A.U.Vekariya(assistant Director-Chemical) Ahmedabad.

Dt. 23/02/2021

(N.D.vaghela)

Deputy Director,

Industrial Safety & health,

Bharuch.

Copy sent to:

1. Director Shree- Industrial Safety & Health, Ahmedabad.
2. Joint Director-Industrial Safety & health, Surat.

નાયબ નિયામક,ઔધોગિક સલામતિ અને સ્વાસ્થ્ય, ભરૂચ
બીજો માળ, બહુમાળી મકાન, ગાયત્રી નગર સામે કણબીવગા,ભરૂચ.
ફોન નં.૦૨૬૪૨-૨૪૦૪૨૧ Email:-dydishbh@gmail.com

તા. ૦૧/૦૩/૨૦૨૧ ક્રમાક/ના.નિ./ભરૂચ/ ૫૪૮ /૨૦૨૧

ત્વરિત/રૂબરૂ ૦/C સ્મૃતિ પત્ર-૧

પ્રતિ,
કબજેદાર/વ્યવસ્થાપકશ્રી,
યુ.પી.એલ.લી. (યુનિટ-૫)
પ્લોટ નં૭૪૬ અને ૭૫૦, જી.આઈ.ડી.સી. ઝગડિયા,
જી. ભરૂચ.

વિષય:-કારખાનામાં તા.૨૩/૦૨/૨૦૨૧ ના રોજ એકસીડન્ટ બનાવ બાદ કારખાનાના તમામ પ્લાન્ટોની સ્ટોરેજ ટેન્કો/ડે ટેન્કો/પ્રોસેસ વેઝલ્સ માં પડી રહેલ હઝાર્ડસ/કેમીકલ/ ઈન્ટરમીડીએટસ નો સલામત રીતે નિકાલ કરવા બાબત.

સંદર્ભ @૧) આપશ્રીનાં તા .૨૭/૦૨/૨૦૨૧ નો પત્ર અન્વયે.
(૨) આપશ્રીનાં તા .૦૧/૦૩/૨૦૨૧ નો પત્ર ક્રમાંક: ના.નિ./ભરૂચ/૫૪૭/૫૪૮/૨૦૨૧

મહાશય,

ઉપરોકત વિષય તથા સંદર્ભ અન્વયે જણાવવાનુ કે, કારખાનામાં તા.૨૩/૦૨/૨૦૨૧ ના રોજ એકસીડન્ટના બનાવ બાદ કારખાનાનાં તમામ પ્લાન્ટો ની સ્ટોરેજ ટેન્કો/ ડે ટેન્કો/પ્રોસેસ વેઝલ્સમાં પડી રહેલ હઝાર્ડસ કેમીકલ્સ/ ઈન્ટરમીડીએટસ નો કોમ્પીટન્ટ ઓથોરીટીની હાજરીમા તેમજ સુપરવીઝન હેઠળ કાઇનલ સ્ટેબલ કન્ડીશનમાં કન્વર્ટ કરીને યોગ્ય અને પૂરતા સલામતીના પગલાં લઇને નિકાલ સત્વરે કરવા જણાવવામાં આવે છે. તથા નિકાલ કરેલ તમામ કેમીકલ્સના જથ્થાની જાણ આ કામગીરી પૂરી થતાં સત્વરે કરવા જણાવવામાં આવે છે.

તા.૨૪-૦૨-૨૧ નાં રોજ આપેલ પ્રોહિબિશન હુકમ તેમાં દર્શાવેલ શરતોનું પાલન જ્યાં સુધી કરવામાં ન આવે ત્યાં સુધી અમલમાં રહેશે જેની નોંધ લેવી.

FACTORY MANAGER UPL LTD., UNIT-5

FACTORY MANAGER
UPL LTD., UNIT-5

૦૧/૦૩/૨૦૨૧

નાયબ નિયામક
ઔધોગિક સલામતિ અને સ્વાસ્થ્ય,
૦/C ભરૂચ

નકલ રવાના: રીજીયોનલ ઓફીસરશ્રી,
ગુજરાત પ્રદુષણ નિયત્રણ બોર્ડની કચેરી અંકલેશ્વર, જી. ભરૂચ.

No. DDISH/BHARUCH/2021/548
Office of the Deputy Director Industrial Health & Safety
Second floor, Multistory building,
Opp. Gayatrinagar, Kanbivaga,
Bharuch .
Date: 01/03/2021

Urgent/Personally

To,

The Occupier / Factory Manager,
U.P.L.Limited (Unit-5)
Plot No. 746 & 750,
Jhagadia-GIDC, Ta: Jhagadia,
Dist. Bharuch.

Subject: Safe disposal of hazardous chemicals/ intermediates remain in storage tanks/ day tanks/ Process vessels of all plants after the explosion accident occurred in the factory on 23/02/2021.

Reference. 1. Your letter of Dt. 27/02/2021.
2. Our office letter vide no. Na.Ni/Bharuch/547/548/2021.

Sir,

With reference to above subject, It is hereby informed to dispose the hazardous chemicals/ intermediates remaining in the storage tanks/ day tanks/ process vessels of various plants by converting them in final stable condition with adequate safety measures in presence and supervision of competent person and inform the same to undersigned in written.

This will remain in force till the conditions mentioned in the prohibition order of dt. 24/02/2021 are not complied.

(N.D.vaghela)

Deputy Director,
Industrial Safety & health,
Bharuch.

Copy sent to:

1. Regional Officer Shri- Gujarat Pollution Control Board office, Ankleshwar, Dist. Bharuch.

Annexure - 7: Details of Breach of Law remarks given by DISH

પેઈજ નં (૧)

ક્રમાંક:ડેડીઆઇએસએચ/ભરૂચ/૨૦૨૧/ ૫૭૭
ડેપ્યુટી ડાયરેકટર ઇન્ડસ્ટ્રીયલ સેફટી એન્ડ હેલ્થ,
બીજો માળ, બહુમાળી મકાન, ગાયત્રીનગર સામે,
કણબીવગા, ભરૂચ.
તા.૦૫/૦૩/૨૦૨૧

પ્રતિ,
કબ્જેદારશ્રી/વ્યવસ્થાપકશ્રી,
યુ.પી.એલ લિમિટેડ (યુનિટ ૫).
પ્લોટ નં –૭૪૬ & ૭૫૦,
જીઆઇડીસી ઝગડીયા,
તા.ઝગડીયા
જિ. ભરુચ.

1. કારખાનામાં તા. ૨૨/૦૨/૨૦૨૧ ની નાઇટશિફ્ટમાં એટલેકે તા. ૨૩/૦૨/૨૦૨૧ ના રોજ વહેલી સવારના આશરે ૧.૪૫ કલાકે ધડાકો થઇ બાદમાં આગ લાગવાનો બનાવ બનેલ. સદરહુ બનાવમાં કારખાનાના સાત શ્રમયોગીઓનુ ઉપરોક્ત અકસ્માતને કારણે અવસાન થયેલ તેમજ અન્ય ૨૬ શ્રમયોગીઓને નાની મોટી ઇજાઓ થયેલ આ બનાવની તપાસ અર્થે
   - નીચે સહી કરનારે શ્રી વાય.એમ.પટેલ, મદદનીશ નિયામક, ઔદ્યોગિક સલામતિ અને સ્વાસ્થ્ય, ભરૂચ સાથે બનાવ ના દિવસે ૦૩.૦૦ કલાકે મુલાકાત લીધેલ.
   - નીચે સહિ કરનારે તા.૨૪/૦૨/૨૦૨૧ ના રોજ શ્રી એસ.સી.બામણીયા, સંયુકત નિયામક , ઔદ્યોગિક સલામતિ અને સ્વાસ્થ્ય, સુરત રીજીયન, સુરત તથા શ્રી એ.યુ. વેકરીયા મદદનીશ નિયામક ઔદ્યોગિક સ્લમાતિ અને સ્વાસ્થ્ય, (કેમીકલ) અમદાવાદ સાથે મુલાકાત લીધી.
   - નીચે સહી કરનારે તા.૦૨/૦૩/૨૦૨૧ ના રોજ શ્રી એ.યુ. વેકરીયા મદદનીશ નિયામક ઔદ્યોગિક સ્લમાતિ અને સ્વાસ્થ્ય, (કેમીકલ) અમદાવાદ સાથે મુલાકાત લીધી.
   - નીચે સહી કરનારે તા.૦૩/૦૩/૨૦૨૧ ના રોજ શ્રી એ.યુ. વેકરીયા મદદનીશ નિયામક ઔદ્યોગિક સ્લમાતિ અને સ્વાસ્થ્ય, (કેમીકલ) અમદાવાદ સાથે મુલાકાત લીધી.
   - તા.૦૩/૦૩/૨૦૨૧ ના રોજ શ્રી એસ.સી.બામણીયા, સંયુકત નિયામક ., ઔદ્યોગિક સલામતિ અને સ્વાસ્થ્ય, સુરત રીજીયન, સુરત. શ્રી પી.એચ.પટેલ, નાયબ નિયામક ઔદ્યોગિક સલામતિ અને સ્વાસ્થ્ય, સુરત તથા શ્રી એમ.એ.મેણાત, ઔદ્યોગિક સલામતિ અને સ્વાસ્થ્ય અધિકારી , સુરતે મુલાકાત લીધી.
   - તા.૦૪/૦૩/૨૦૨૧ ના રોજ નીચે સહી કરનારે એન.જી.ટી કમિટીના ડો. એમ.ડી.મોડીયા, જીલ્લા કલેકટર અને ડિસ્ટ્રિકટ મેજિસ્ટ્રેટશ્રી , ભરુચ, આર.આર.વ્યાસ, પ્રાદેશીક અધિકારી, જી.પી.સી.બી,ભરુચ,શ્રી અમિતભાઇ આર ઠક્કર , સાયન્ટિસ્ટ, સી.પી.સી.બી, વડોદરા ,ડો.ઉપેન્દ્ર ડી પટેલ, પ્રોફેસર, સિવીલ એંજીનીયરીંગ ડિપાર્ટમેન્ટ, ફેકલ્ટી ઓફ ટેક્નોલોજી, એમ.એસ. યુનિવર્સિટી,વડોદરા તથા શ્રી પી.એસ.કેશવાણી જી.એન.એફ.સી ભરુચ સિનિયર એકઝીક્યુટિવ(ફાયર -સેફ્ટી)- (કેમિકલ એક્સિડેન્ટ એક્સપર્ટ) સાથે મુલાકાત લીધી.
   - તા. ૦૫/૦૩/૨૦૨૧ ના રોજ નીચે સહી કરનારે મુલાકાત લીધી.

પેજ નં ૩

૦૬.૦૦ કલાક સુધીમાં મળેલ હતી. ત્યારબાદ ક્રમશ: બીજા અને ત્રીજા દિવસે શ્રમયોગીશ્રી કેતનકુમાર ગેવરીયા તથા શ્રી કુવરલાલ કોમલ કાસ્ટેકરની લાશ સી.એમ.પ્લાન્ટના કાટમાળ નીચેથી મળેલ હતી. સદરહુ ધડાકાના બનાવને કારણે અન્ય ૨૬ શ્રમયોગીઓને વિવિધ પ્રકારની નાની મોટી ઇજાઓ થયેલ હતી. હાલની પરિસ્થિતિએ કારખાનાનાં શ્રમયોગીઓશ્રી કૃણાલ પટેલ, શ્રી મણીરામ શાન્તુરામ ધિકારે અને શ્રી કમલ લક્ષ્મણ કાન્સેની લાશ મળેલ નથી પરંતુ કારખાનામાં ફેકટેરી મેનેજરશ્રીએ આજરોજ લેખિતમાં મૃત જાહેર કરેલ છે. કારખાનાના સી.એમ.પ્લાન્ટ માં એકસપ્લોઝન સાથે ફાયર ના બનાવ ને લીધે તેનો DCS કંટ્રોલ રુમ તુટી ગયેલ છે અને DCS કંટ્રોલ રુમની સિસ્ટમમાં R-25001માં રહેલ કેમિકલના જથ્થાનો રેકોર્ડ રહેલ હોય છે અને DCS કંટ્રોલ રુમ કોલાપ્સડ સ્ટ્રક્ચર નીચે આજની સ્થિતીએ દટાયેલ છે.

5. અત્રે ની કચેરીના તા. ૦૫/૦૩/૨૦૨૧ના પત્રકમાંક ના.નિ./ભરુચ/૫૭૧/૨૦૨૧ થી શ્રી એ.યુ.વેકરીયા, મદદનીશ નિયામક, (કેમીકલ),અમદાવાદને આ અકસ્માતના બનાવ બાબતે અભિપ્રાય માંગતા ડાયરેક્ટરશ્રી, ઇન્ડસ્ટ્રીયલ સેફ્ટી એન્ડ હેલ્થ, ગુજરાત રાજ્ય ના પત્રકમાંક ડીઆઇએસેય/એચ-સેફ્ટી/ કેમીકલ /૨૦૨૧ /૯૯ થી તેઓએ નીચે મુજબ અભિપ્રાય આપેલ છે.

"કારખાનાના સી.એમ .ઉત્પાદન પ્લાન્ટમાં ક્રોટોનાલ્ડીહાઇડ, ટ્રાય ઇથાઇલ એમાઇન, ઇથાઇલ મર્કેપ્ટન, મિથાઇલ પીપરીડીન, હાઇડ્રોકલોરીક એસિડ, ટોલ્વીન, સોડીયમ હાઇડ્રોકસાઇડ, ડાયમિથાઇલ મેલોનેટ, ડાયમિથાઇલ એમિનોપીરીડીન, પ્રોપીયોનીક એનહાઇડ્રાઇટ, સોડિયમ મિથોક્સાઇડ વગેરે ફ્લેમેબલ હેઝાર્ડ, રીએકટીવીટી હેઝાર્ડ તથા ઓક્સીડાઇઝીંગ પ્રોપર્ટી ધરાવતાં કેમીકલનો ઉપયોગ કરીને વિવિધ ઇન્ટરમીડીએટ્સ પ્રોસેસ દ્વારા ૩-ઇથાઇલથાયો બ્યુટેનાલ, મિથાઇલ એસીટો એસીટેટના સોલ્ટ, ૬-ઇથાઇલ થાયો-૩-હેપ્ટેન-૨-૧, એસિટાઇલ હાઇડ્રોકસી એમાઇન, એસિટાઇલ ક્લોરો પ્રોપીનીલ હાઇડ્રોક્સીલ એમાઇન, ક્લોરો પ્રોપીનીલ હાઇડ્રોક્સીલ એમાઇન જેવા ઇન્ટરમીડીએટ કેમીકલ પ્રોડક્ટ દ્વારા ક્લેથોડીમનું ઉત્પાદન કરવામાં આવે છે. સી.એમ .ઉત્પાદન પ્લાન્ટનું તા.૫/૨/૨૦૨૧થી બોઇલર ઇન્સ્પેકશનને કારણે પ્લાન્ટ શટડાઉન હોઇ તેમજ શટડાઉનના સમયગાળા દરમ્યાન એટલે કે તા.૫/૨/૨૦૨૧થી તા.૨૩/૨/૨૦૨૧ ના રોજ સવારે સમય ૧.૪૫) અકસ્માત સમય (સુધી ઉક્ત જોખમી કેમીકલ્સ તથા ઇન્ટરમીડીએટ્સ પ્રોડક્ટ પ્લાન્ટના પ્રોસેસ વેસેલમાં સંગ્રહ કરવામાં આવેલ હતા .સંગ્રહિત જોખમી કેમીકલ્સ તથા ઇન્ટરમીડીએટ્સ પ્રોડક્ટના મટીરીયલ સેફ્ટી ડેટા શીટ જોતાં આ તમામ કેમીકલ્સ ફ્લેમેબલ, રીએકટીવ તથા એક્ષપ્લોઝીવ મીક્ષસચર ફોર્મેશન તથા ડીકમ્પોઝીશન થવાના જોખમો ધરાવે છે .આમ સદર અકસ્માત સંગ્રહિત કેમીકલ્સની ફીઝીકલ તથા કેમીકલ પ્રોપર્ટીઝમાં ફેરફાર થવાને કારણે એટલે કે ડેન્જરસ કેમીકલ રીએકશન થવાને કારણે બનવા પામેલ હોવાની શક્યતા જણાય છે .આથી આવા જોખમી કેમીકલ્સ કેટલા સમય સુધી અને કેવા પ્રકારના વાતાવરણમાં સંગ્રહિત રાખવા તે પ્રકારનો ઊંડાણપૂર્વકનો અભ્યાસ કરવો ખૂબ જ જરૂરી છે. આ ઇન્ટરમીડીએટ્સ પ્રોડક્ટ / કેમીકલ્સનો અગાઉથી રીએકટીવીટી હેઝાર્ડ સ્ટડી / ઇનસ્ટેબીલીટી હેઝાર્ડ સ્ટડી / કમ્પેટીબીલીટી સ્ટડી / થર્મલ ડીકમ્પોઝીશન સ્ટડી વગેરે જેવા પ્રોસેસ હેઝાર્ડ સ્ટડી કરવામાં આવેલ હોત અને આ સ્ટડી રીપોર્ટના આધારે કેમીકલ રીએકટીવીટી હેઝાર્ડ જાણી શકાયા હોત તો ઉક્ત સંગ્રહિત ઇન્ટરમીડીએટ કેમીકલ્સનો પ્લાન્ટ શટડાઉન લેતાં પહેલા યોગ્ય નિકાલ કરવામાં આવેલ હોત તો આ પ્રકારનો અકસ્માત બનતાં અટકાવી શકાયો હોત. સદર અકસ્માત બનાવ અંગે ગુજરાત કારખાના નિયમો, ૧૯૬૩ના નિયમ ૧૦૨ની અનુસુચિ ૧૯ના ભાગ ૨ ના પેરા ૫ ની જોગવાઇઓનો ભંગ થતો હોવાનું જણાય છે"

પેજ નં (૩)

2. સદરહુ અકસ્માત બનાવની જાણ ટેલીફોન દ્વારા તેમજ બાદમાં તા.૨૩/૦૨/૨૦૨૧ ના રોજ તથા તા. ૦૫/૦૩/૨૦૨૧ ના રોજ ફોર્મ નં.૨૧ માં લેખિતમાં કરેલ છે.
3. ઉપરોકત કારખાનુ કારખાના ધારા હેઠળ લા.નં ૫૫૧૪ થી નોંધાયેલ છે જે ૫૦૦૦થી વધુશ્રમયોગી /૫૦૦૦ થી વધુ હો.પા માટે વર્ષ ૨૦૨૨ સુધી રિન્યુ થયેલ છે.
4. કારખાનાની અમારી અકસ્માત સંદર્ભે લીધેલી સ્થળ મુલાકાતો દરમિયાન અમોએ કારખાનામાં કરેલ પુછપરછ, અમોએ કારખાનામાં અકસ્માત સ્થળની કરેલ તપાસ,અકસ્માત સમયે કારખાનામાં હાજર શ્રમયોગીઓના લીધેલા લેખિત નિવેદનો, અકસ્માતની જાણ અંગેનુ ફોર્મ નં.૨૧, કારખાનાનુ અકસ્માત રજીસ્ટર ફોર્મ નં.૨૯ વિગેરેના આધારે અકસ્માત બનાવની હકિકત નીચે મુજબ છે.

કારખાનામાં અલગ-અલગ પ્રકારનાં કુલ ૧૭ પ્લાન્ટ આવેલા છે. આ ૧૭ પ્લાન્ટ પૈકી એક પ્લાન્ટ સી.એમ. (ક્લેથેડિયમ એન્ડ ગ્લુકોસિનેટ પ્લાન્ટ) છે. આ સી.એમ. પ્લાન્ટમાં કોટોનાલ્ડીહાઇડ, ટ્રાય ઇથાઇલ એમાઇન, ઇથાઇલ મર્કેપ્ટન, મિથાઇલ પીપરીડીન, હાઇડ્રોકલોરીક એસિડ, ટોલ્વીન, સોડીયમ હાઇડ્રોકસાઇડ, ડાયમિથાઇલ મેલોનેટ, ડાયમિથાઇલ એમિનોપીરીડીન, પ્રોપીયોનીક એનહાઇડ્રાઇટ, સોડિયમ મિથોક્સાઇડ વગેરે કેમિકલ્સ ફ્લેમેબલ હઝાર્ડ્સ, રિએકટીવીટી હઝાર્ડ્સ તથા ઓક્સિડાઇઝિંગ પ્રોપર્ટી ધરાવતા કેમીકલ્સ નો ઉપયોગ કરીને વિવિધ ઇન્ટરમીડીએટ્સ પ્રોસેસ દ્વારા ૩-ઇથાઇલથાયો બ્યુટેનાલ, મિથાઇલ એસીટો એસીટેટના સોલ્ટ, ૬-ઇથાઇલ થાયો-૩-હેટેન-૨-૧, એસિટાઇલ હાઇડ્રોકસી એમાઇન, એસિટાઇલ ક્લોરો પ્રોપિનીલ હાઇડ્રોકસીલ એમાઇન, ક્લોરો પ્રોપિનીલ હાઇડ્રોકસીલ એમાઇન જેવા ઇન્ટરમીડીએટ કેમીકલ પ્રોડક્ટ દ્વારા ક્લેથોડીયમનું ઉત્પાદન કરવામાં આવે છે. રો-મટીરીયલ તેમજ ઇન્ટર્મિડિયેટસ અને પ્રોડકટસ તરીકે રહેલ સદર કેમિકલ્સ ફ્લેમેબીલીટી, રિએકટીવીટી, ઓકસેડાઇઝીંગ વગેરે જેવી હેઝાર્ડસ પ્રોપર્ટી ધરાવે છે. કારખાનામાં સી.એમ.પ્લાન્ટને કન્સર્ન એવા બોઇલરનુ ઇન્સ્પેકશન લેવાનુ હોઇ તા.૦૫/૦૨/૨૦૨૧ ના રોજ થી સી.એમ.પ્લાન્ટ બંધ કરવામાં આવેલ હતો. સદર પ્લાન્ટ બંધ કર્યા સમયે પ્લાન્ટમાં રહેલ ઉપરોકત હેઝાર્ડસ કેમિકલ્સ પ્લાન્ટના પ્રોસેસ/સ્ટોરેજ વેસલ્સમાં જ સંગ્રહીત રાખવામાં આવેલ હતા. તા.૨૨/૦૨/૨૦૨૧ ના રોજ નાઇટશિફટમાં એટલેકે તા.૨૩/૦૨/૨૦૨૧ ના રોજ વહેલી સવારે ૦૧:૪૫ કલાકે સી.એમ.પ્લાન્ટના ત્રીજા ફલોર ઉપર રાખવામાં આવેલ રિએકટર નં.-R-25001 માં ૩-ઇથાઇલ થાયો બ્યુટેનાલ નામની પ્રોડક્ટ ભરેલી હતી જે ઇથાઇલ મરકેપ્ટન, કોટોનાલ્ડીહાઇડ અને ટ્રાય ઇથાઇલ એમાઇનનુ રિએકશન કરીને બનાવેલ હતી અને તા. ૦૫/૦૨/૨૦૨૧ના રોજ આ સી.એમ પ્લાન્ટને શટડાઉનમાં લેવાયો તે વખતે રિએકટર નં.-R-25001 માં ૩-ઇથાઇલ થાયો બ્યુટેનાલ નામની પ્રોડક્ટ ભરેલી હતી તેમજ તા. ૨૩/૦૨/૨૦૨૧ સુધી આ રિએકટર આ પ્રોડક્ટથી ભરેલ સ્થિતીમાં રહેલ હતુ તેથી એક્ઝોથ્રોમિક મિક્સચર ફોર્મેશન, ડિકમ્પોઝિશન/રિએકશન આટલા લાંબા સમય દરમિયાન રિએકટર નં.-R-25001 માં થવાથી અચાનક તા. ૨૩/૦૨/૨૦૨૧ના રોજ વહેલી સવારે ૦૧:૪૫ કલાકે પ્રચંડ ધડાકો થયેલ હતો અને ત્યારબાદ લાગેલ આગ સી.એમ પ્લાન્ટના ચાર સેકશનમાં ફેલાઇ ગયેલ હતી તથા અત્યંત બ્લેક કલરનો ધુમાડો આસપાસમાં ફેલાઇ ગયેલ હતો. કારખાનાનાં ફાયર ટેન્ડરો ઉપરાંત નજીકમાં આવેલ અન્ય કારખાનાનાં ફાયર ટેન્ડરો ,DPMC અંકલેશ્વર , DIA દહેજના ફાયર ટેન્ડરો, ભરુચ નગરપાલિકાના ફાયર ટેન્ડરો વગેરેની મદદ વડે આગને તા.૨૩/૦૨/૨૦૨૧ ના રોજ સવારના આશરે ૦૮.૩૦ કલાકે સંપુર્ણ રીતે કાબુમાં લેવામાં આવેલ. ઉપરોકત ધડાકાના કારણે સી.એમ. પ્લાન્ટના બર્સ્ટ/ કોલેપ્સ થયેલ સ્ટ્રકચર નીચેથી શ્રમયોગીશ્રી વનરાજસિંહ ડોડિયા , શ્રી નેહલ મહેતા ની લાશ તા.૨૩/૦૨/૨૦૨૧ ના રોજ સાંજના

પેરા નં (7)

6. સદરહુ ધડાકા તેમજ આગને લીધે પ્રાણઘાતક અકસ્માત બનાવની તપાસ કરતા જાણવા મળેલ છે કે કારખાનાના સી.એમ પ્લાન્ટમાં ક્લોરોનાલ્ડીહાઇડ, ટ્રાય ઇથાઇલ એમાઇન, ઇથાઇલ મર્કેપ્ટન, મિથાઇલ પીપરીડીન, હાઇડ્રોકલોરીક એસિડ, ટોલ્વીન, સોડીયમ હાઇડ્રોકસાઇડ, ડાયમિથાઇલ મેલોનેટ, ડાયમિથાઇલ એમિનોપીરીડીન, પ્રોપીયોનીક એનહાઇડ્રાઇટ, સોડિયમ મિથોક્સાઇડ વગેરે કેમિકલ્સ ફ્લેમેબલ હઝાર્ડ્સ, રિએકટીવીટી હઝાર્ડ્સ તથા ઓક્સિડાઇઝિંગ પ્રોપર્ટી ધરાવતા કેમીકલ્સ નો ઉપયોગ કરીને વિવિધ ઇન્ટરમીડીએટ્સ પ્રોસેસ દ્વારા ૩-ઇથાઇલથાયો બ્યુટેનાલ, મિથાઇલ એસીટો એસીટેટના સોલ્ટ, ૬-ઇથાઇલ થાયો-૩-હેટેન-૨-૧, એસિટાઇલ હાઇડ્રોકસી એમાઇન, એસિટાઇલ ક્લોરો પ્રોપિનીલ હાઇડ્રોક્સીલ એમાઇન, ક્લોરો પ્રોપિનીલ હાઇડ્રોક્સીલ એમાઇન જેવા ઇન્ટરમીડીએટ કેમીકલ પ્રોડક્ટ દ્વારા ક્લેથોડીયમનું ઉત્પાદન કરવામાં આવે છે. રો-મટીરીયલ તેમજ ઇન્ટર્મિડિયેટસ અને પ્રોડકટસ તરીકે રહેલ સદર કેમિકલ્સ ફ્લેમેબીલીટી, રિએકટીવીટી, ઓકસેડાઇઝીંગ વગેરે જેવી હેઝાર્ડસ પ્રોપર્ટી ધરાવે છે. કારખાનામાં સી.એમ.પ્લાન્ટને કન્સર્ન એવા બોઇલરનુ ઇન્સ્પેકશન લેવાનુ હોઇ તા.૦૫/૦૨/૨૦૨૧ ના રોજ થી સી.એમ.પ્લાન્ટ બંધ કરવામાં આવેલ હતો. સદર પ્લાન્ટ બંધ કર્યા સમયે પ્લાન્ટમાં રહેલ ઉપરોકત હેઝાર્ડસ કેમિકલ્સ પ્લાન્ટના પ્રોસેસ/સ્ટોરેજ વેસલ્સમાં જ સંગ્રહીત રાખવામાં આવેલ હતા. તા.૨૨/૦૨/૨૦૨૧ ના રોજ નાઇટશિફટમાં એટલેકે તા.૨૩/૦૨/૨૦૨૧ ના રોજ વહેલી સવારે ૦૧:૪૫ કલાકે સી.એમ.પ્લાન્ટના ત્રીજા ફ્લોર ઉપર રાખવામાં આવેલ રિએકટર નં.-R-25001 માં ૩-ઇથાઇલ થાયો બ્યુટેનાલ નામની પ્રોડક્ટ ૮.૫ ટન(સાડા આઠ ટન) જેટલી ભરેલી હતી જે ઇથાઇલ મરકેપ્ટન, ક્લોરોનાલ્ડીહાઇડ અને ટ્રાય ઇથાઇલ એમાઇનનુ રિએકશન કરીને બનાવેલ હતી અને તા. ૦૫/૦૨/૨૦૨૧ના રોજ આ સી.એમ પ્લાન્ટને શટડાઉનમાં લેવાયો તે વખતે રિએકટર નં.-R-25001 માં ૩-ઇથાઇલ થાયો બ્યુટેનાલ નામની પ્રોડક્ટ ભરેલી હતી તેમજ તા. ૨૩/૦૨/૨૦૨૧ સુધી આ રિએકટર આ પ્રોડકટથી ભરેલ સ્થિતીમાં રહેલ હતુ તેથી એક્સ્પ્લોઝિવ મિક્સચર ફોર્મેશન, ડિકમ્પોઝિશન/રિએકશન આટલા લાંબા સમય દરમિયાન રિએકટર નં.-R-25001 માં થવાથી અચાનક તા. ૨૩/૦૨/૨૦૨૧ના રોજ વહેલી સવારે ૦૧:૪૫ કલાકે પ્રચંડ ધડાકો થયેલ હતો અને ત્યારબાદ લાગેલ આગ સી.એમ પ્લાન્ટના ચાર સેકશનમાં ફેલાઇ ગયેલ હતી તથા અત્યંત બ્લેક કલરનો ધુમાડો આસપાસમાં ફેલાઇ ગયેલ હતો તથા કારખાનામાં પાવર જનરેશનનો પ્લાન્ટ પણ આવેલ છે. આમ, કારખાનાને કારખાનાધારા ૧૯૪૮ની પહેલી અનુસુચિના અનુક્રમ નં ૫,૧૭ તથા ૧૮માં દર્શાવ્યા મુજબની હેઝાર્ડસ ઇન્ડસ્ટ્રીમાં વર્ગીકૃત કરી શકાય.

આવી ઇન્ડસ્ટ્રીઝને ગુજરાત કારખાના નિયમો ૧૯૬૩ના નિયમ ૧૦૨ હેઠળનુ શિડ્યુલ ૧૯ લાગુ પડે છે. સદર શિડ્યુલ ૧૯ ના ભાગ ૨ ના પેરા ૫ મુજબ આવી પ્રોસેસમાં ડેન્જરસ કેમીકલ રિએક્શન થતી હોઇ તા. ૦૫/૦૨/૨૦૨૧ ના રોજ સી.એમ પ્લાન્ટના રિએકટર નં.-R-25001 સહિત આખા સી.એમ પ્લાન્ટને શટડાઉનમાં મુકતા પહેલા અગાઉથી રિએકટીવીટી હેઝાર્ડ સ્ટડી /ઇનસ્ટેબીલીટી સ્ટડી/ કમ્પેટીબીલીટી સ્ટડી /સ્ટોરેજ થર્મલ સ્ટડી /સેફ્ટી એન્ડ હેલ્થ હઝાર્ડ્સ ઇવેલ્યુએશન જેવા કાળજીપુર્વકનો અભ્યાસ કરીને તૈયાર કરવો/કરાવવો જોઇએ. જો આવા પ્રકારનો કાળજીપુર્વકનો અભ્યાસ તા. ૦૫/૦૨/૨૦૨૧ના રોજ સદરહુ રિએકટર નં.-R-25001 સહિત આખા સી.એમ પ્લાન્ટનો કારખાનાના સી.એમ. પ્લાન્ટને શટડાઉન માં મુકતા પહેલા કરેલ હોત તો સંગ્રહિત કેમીકલ્સની ફીઝીકલ તથા કેમીકલ પ્રોપર્ટીઝમાં ફેરફાર થવાને કારણે એટલે કે ડેન્જરસ કેમીકલ રીએકશન થવાની સંભાવના જાણી શકાઇ હોત તો ઉક્ત સંગ્રહિત ઇન્ટરમીડીએટ કેમીકલ્સનો પ્લાન્ટ શટડાઉન લેતાં પહેલા યોગ્ય નિકાલ કરવામાં

પેજ નં (૧૧)

આવેલ હોત અને આ પ્રકારનો અકસ્માત બનતાં અટકાવી શકાયો હોત. પરંતુ આ પ્રકારનો કોઇ સ્ટડી પ્લાન્ટ શટડાઉન લેતાં પહેલાએટલે કે તા૦૫/૦૨/૨૦૨૧ પહેલા કે બનાવના દિવસ સુધી એટલે કે તા. ૨૩/૦૨/૨૦૨૧ સુધી કરવામાં /કરાવવામાં આવેલ ન હોવાના કારણે આ સ્ટડી રિપોર્ટના આધારે કેમીકલ રિએકટીવીટી હેઝાર્ડ જાણી શકાયા ન હતા જેથી ઉપરોક્ત દર્શાવિલ હેઝાર્ડસ રો-મટિરીયલ , ઇન્ટરમિડિએટ ,પ્રોડકટનો પ્લાન્ટ શટડાઉન લેતા પહેલા યોગ્ય નિકાલ કરવામાં આવેલ ન હતો. જેના કારણે કારખાનાના સી.એમ. પ્લાન્ટ ના રિએકટર નં.-R-25001માં પ્રચંડ ધડાકો અને ત્યારબાદ આગ લાગવાનો બનાવ બનેલ હતો જેમાં કુલ ૦૭ શ્રમયોગીઓના અવસાન થયેલ તેમજ ૨૬ શ્રમયોગીઓ ને નાની મોટી ઇજાઓ થયેલ. આમ, હેઝાર્ડ્સ પ્રોસેસ ધરાવતી ઇન્ડસ્ટ્રીમાં પ્રોસેસ/ કેમીકલ્સનો અગાઉથી રિએકટીવીટી હેઝાર્ડ સ્ટડી /ઇનસ્ટેબીલીટી સ્ટડી/ કમ્પેટીબીલીટી સ્ટડી /સ્ટોરેજ થર્મલ સ્ટડી / કાળજીપુર્વકનો અભ્યાસ કર્યા સિવાય સી.એમ પ્લાન્ટના રિએકટર નં.-R-25001માં સદરહુ હઝાર્ડસ ઇન્ટરમિડિએટ પ્રોડકટ ભરેલ સ્થિતીમાં શટડાઉન પછી રાખીને કારખાનાના કબ્જેદાર /વ્યવસ્થાપકશ્રીએ ગુજરાત કારખાના નિયમો ૧૯૬૩ના નિયમ ૧૦૨ હેઠળનુ શિડ્યુલ ૧૯ ના ભાગ ૨ ના પેરા ૫ નો ભંગ કરેલ છે.

7. આ પ્રકારનો અકસ્માત કારખાનામાં ફરી ન બને તે માટે નીચે મુજબના પગલાં ભરી તેની જાણ લેખીતમાં મારી કચેરીએ કરવી.

   (અ) કારખાનાના સી.એમ પ્લાન્ટ સહિત અન્ય તમામ પ્લાન્ટોના તમામ પી એન્ડ આઇડી કન્સીડર કરીને નિષ્ણાંત વ્યક્તિ/એજન્સી પાસે ઇન્ટરમીડીએટ્સ પ્રોડકટ / કેમીકલ્સનો અગાઉથી રીએકટીવીટી હેઝાર્ડ સ્ટડી / ઇનસ્ટેબીલીટી હેઝાર્ડ સ્ટડી / કમ્પેટીબીલીટી સ્ટડી / સ્ટોરેજ થર્મલ સ્ટડી કરાવ્યા બાદ તેનો કમ્પ્લાયન્સ રિપોર્ટ અત્રેની કચેરીએ રજુ કરવો.

8. અમારી મુલાકાત સમયે રુબરૂમાં પુછતા કારખાનાના કબ્જેદાર તરીકે શ્રી અરુણ સી આશાર તથા વ્યવસ્થાપક તરીકે શ્રી અનિલ સી મુંદાડા છે.
9. રીમાર્ક્સ નં ૦૪ માં દશવિલ ૦૭ શ્રમયોગીઓના બાકી નીકળતા પગાર તથા હક્કરજાના નાણાં તેમજ કાયદેસર નીકળતા વળતર ના નાણાં અને વધારાનું વળતર તેઓના કાયદેસર ના વારસદારોને ચૂકવી તેની જાણ પૂરાવા સહિત લેખીતમાં મારી કચેરીએ કરવી.
10. ઉપરોક્ત રીમાર્ક નં.૬ માં દશવિલ ભંગ બદલ કોઇ ખુલાસો હોય તો દિન-૭ માં આધાર પૂરાવા સહિત મારી કચેરીએ રજૂ કરવો.

FACTORY MANAGER
UPL LTD., UNIT-5

(એન.ડી.વાઘેલા)
ડેપ્યુટી ડાયરેક્ટર
ઇન્ડસ્ટ્રીયલ સેફટી એન્ડ હેલ્થ,
ભરૂચ

English Translation of Breach of Law remarks given by DISH

No: DEDISH/Bharuch/2021/577
Office of the Deputy Director
(Industrial Safety & Health)
Second floor, Multistory building
Opp. Gayatrinagar, kanbivaga,
Bharuch.
Date: 05/03/2021

To,
The Occupier/ Factory Manager,
U.P.L. Limited (Unit – 5)
Plot No: 746 & 750,
Jhagadia-GIDC, Ta: Jhagadia,
Dist.: Bharuch

1. In night shift of 22nd February 2021 i.e. early morning of 23rd February 2021 at 1:45 AM. explosion occurs in the factory in which 7 workers died and other 26 workers sustain minor and major injuries. For this incident inspection purpose.
   - Undersigned jointly visited the factory with Mr. Y.M. Patel Assistant Director (Industrial Safety & Health) early morning of 23rd Feb 2021 at 03:00 AM.
   - Undersigned jointly visited the factory with Mr. S.C. Bamaniya (Joint Director Industrial Safety & Health) Surat region, Surat and Mr. A.U. Vekariya (Assistant Director - Chemical), Ahmedabad on 24th February 2021.
   - Undersigned jointly visited the factory with Mr. Mr. A.U. Vekariya (Assistant Director Chemical), Ahmedabad on 2nd March 2021.
   - Undersigned jointly visited the factory with Mr. Mr. A.U. Vekariya (Assistant Director Chemical), Ahmedabad on 3rd March 2021.
   - Mr. Mr. S.C. Bamaniya (Joint Director - Industrial Safety & Health) Surat region, Surat, Mr. P.H. Patel Deputy Director - Industrial Safety & Health, Surat and Mr. M.A. Menat (Industrial Safety & Health officer) Surat, Visited the factory on 3rd March 2021.
   - Undersigned visited the factory jointly with N.G.T. Committee Dr. M.D. Modiya (District Collector and District Magistrate) Bharuch, Mr. R.R. Vyas (Regional Officer GPCB Bharuch, Mr. Amitbhai R. Thakkar Scientist, CPCB Vadodara, Dr. Upedra D. Patel (Professor Civil Engineering Department) Faculty of Technology, M.S.

1

University, Vadodara and Mr. P.S. Keshwani (Senior Executive Fire & Safety – Chemical Accident Expert).

- Undersigned visited the factory on 5th March 2021.

2. I received the incident information through telephone on 23rd Feb 2021 after incident and subsequently Form No:21 regarding accident is Submitted to the office on 23rd Feb 2021 and 5th March 2021.
3. The factory is registered under Factory Act with Licence No. 5514 and its renewed for more than 5000 Worker and more than 5000 HP till Year 2022.
4. Based on inquiry in the factory regarding this accident during our visits, our inspection of accident place in the factory, written statement of the witness workers/ employees, accident information form no. 21, accident register form no.29 etc., the fact of incident/ accident is as mentioned below.

   There are 17 different plants inside the factory, with this one of the plant named CM (Clethodim & Glufocinate plant) is there. In this CM plant Clethodim and diff. intermediate like 3 ethyl thiobutanal, methyl aceto acetate salt, 6-ethyl thio 3-hepten 2-1 manufactured by using raw material like crotonaldehyde, TEA, Ethyl Mercaptane, Nethyl Pyridine, HCL, Toluene, NaOH, Di Methyl Melonate, Dy Methyl Amido Pyridine, Propionic Anhydride, Sodium Methoxide, etc.

   Raw materials and intermediates chemicals having hazardous properties of flammability, Reactivity, Oxidizing. Shut down was taken for CM plant from 05-02-2021 for annual Boiler Inspection, during shutdown period hazardous chemicals as above mentioned were stored inside plants Process Vessel / Reactor.

   Major explosion took place in R-25001 reactor at third floor of this plant and major fire happened, the fire got spread in plants all 4 sections and heavy black smoke spread at nearby area, in the factory in Night Shift of 22nd February 2021 means early morning of 23rd February 2021 at 1:45 AM.

   Fire was controlled totally till 8:30 am on Dt. 23rd February 2021 with the help of Factories Fire Tenders as well as nearby areas fire tenders like DPMC Ankleshwar, DIA Dahej, Bharuch Nagar Palika. Dead body of workers Shri Vanraj Dodiya, Shri Nehal Mehta was removed till 6:00 pm from under collapsed / damaged structure of CM Plant. After that dead body of worker Shri Ketan Kumar Gevariya was removed on next day and Shri Kuvarlal Komal Kasdekar was recovered on next to next day from collapsed / damaged structure of CM Plant. Other 26 workers had minor-major injuries due to explosion. As per current situation the dead body of worker Shri Kunal Patel, Shri Maniram Shanturam Dhikare and Shri Kamal Laxman Kanse still missing but Factory manager declared presumed dead in writing.

   DCS control room is broken in which record of reactor R-25001 may be exist.

5. Assistant Director – (Chemical), Ahmedabad was asked opinion through written latter via Sr. No. Dy. DISH/Bharuch/571/2021, Dated 05th March 2021, Assistant Director (Chemicals), Ahmedabad has given opinion as under via. DISH/H-Safety/Chemical/2021/99.

   "Inside CM Plant of factory, there is Clethodium and diff. intermediate like 3 ethyl thio butanal, methyl aceto acetate salt, 6-ethyl thio 3-hepten 2-1, Acetyl Hydroxil Amine, Chloro Propinil Hydroxil amine are manufactured by using hazardous raw material which having hazardous properties of flammability, Reactivity, Oxidizing sabstances like Crotonaldehyde, TEA, Ethyl Mercaptan, Methyl Pyridine, HCL, Toluene, NaOH, Di Methyl Melonate, Dy Methyl Amido Pyridine, Propionic Anhydride, Sodium Methoxide, etc. Shut Down was taken for CM Plant from 05-02-2021 for related boiler's inspection, during shut down period till 1:45 AM of 23rd February 2021 (Accident Date) hazardous chemical as above mention were kept inside the process vessel / reactor. With referring MSDS of such hazardous chemicals and intermediates products, possess Flammability, Reactive & Explosive mixture formation as well as decomposition kind of hazards. Incident had happened due to probable reason – "changes in physical and chemical property of stored hazardous chemicals in the reactor i.e. dangerous chemical reaction in reactor R 25001". So, this is very important that deep analysis is required for time period up to which such hazardous chemical can be stored in reactor & in which type of atmosphere such hazardous chemicals can be kept safely. If proper analysis like Reactivity Hazard Study / Instability Hazard Study / Combability Hazard Study / Thermal Decomposition study was done for such chemicals / Intermediates well in advance i.e. before 5th February 2021, then we can know about chemicals reactivity hazards, based on that analysis report well in advanced, intermediate / Hazardous Chemicals kept in reactor / Process Vessel appropriately removed from the reactor / Process Vessel and therefore such accident can be prevented. For this accident, there is violation of "Pera 5 of Part – II Schedule 19 of Rule 102 of Gujarat Factories Rules 1963".

6. During investigation of this fatal accident, it is observe that inside CM Plant of the factory Crotonaldehyde, TEA, Ethyl Mercaptan, Methyl Pyridine, HCL, Toluene, NaOH, Di Methyl Melonate, Dy Methyl Amido Pyridine, Propionic Anhydride, Sodium Methoxide, etc. chemicals were used having Flammable Hazards, Reactivity Hazards & Oxidizing Hazards. and this Hazardous chemical used for manufacturing of 3 ethyl thio butanal, methyl aceto acetate salt, 6-ethyl thio 3-hepten 2-1, Acetyl Hydroxil Amine, Chloro Propinil Hydroxil amine. As well as by intermediate chemical product Clethodim is manufacture. Raw material as well as intermediates & products possess chemical Flammability, Reactivity, Oxidizing etc Hazardous properties. Shut down

was taken for CM plant from 5th February 2021 for annual Boiler Inspection, During shutdown period hazardous chemicals as above mentioned were stored inside plants in the Process Vessel / Reactor. In the night shift of 22nd February 2021 i.e. early morning of 23rd February 2021 at 01:45 AM, 3rd floor of CM Plant Reactor R 25001 containing 8.5 MT 3 ethyl thio butanal suddenly exploded. 3 ethyl thio butanal is made by reaction of Ethyl Mercaptan, Crotonaldehyde & Tri Ethyl Amine in reactor R 25001 before shut down 5th February 2021 and was kept up to 1:45 AM of 23rd February 2021. Therefor explosive mixture formation, decomposition / Reaction takes place for such a long-time duration in reactor R 25001 and suddenly explosion occurs in that reactor at 1:45 AM of 23rd February 2021 and there by big fire expanded in four sections of CM Plant as well as dark smoke spread over the entire CM plant. Power plant existing in the factory therefore as per Sr. No. 5, 17 & 18 of First Schedule of the Factories Act 1948 this factory is categorised as Hazardous industries. For such industries Schedule 19 of Rule 102 of Gujarat Factories Rule 1963 is applicable. As per Pera - 5 of Part - II of the Schedule 19, the process in which dangerous chemical reaction is being done, well in advanced i.e. before 5th February 2021, Reactivity Hazards Study / Instability Study / Compatibility Study / Storage Thermal Study / Safety & Health Hazards Evaluation – careful analysis should be done precisely. If such types of careful analysis for content existing in reactor R 25001 was carried out before 5th February 2021, Chances of dangerous chemical reaction due to long time period storage of such Hazardous Chemicals in reactor R 25001, can be obtained and therefore before taking the plant shutdown content of the reactor R 25001 might be removed safely and there by this accident might be prevented. But such type of careful analysis was not carried out before putting the plant in shutdown i.e. 5th February 2021, also up to the day of accident i.e. 23rd February 2021 such type of necessary careful analysis was not carried out. In absent of such type of careful analysis report, Chemical Reactivity Hazards can not be found well in advance. Therefore above mention intermediate, product, chemicals were not taken out from reactor R 25001 before putting plant in shut down on 5th February 2021 and were kept as it is in reactor R 25001 thereby on 23rd February 2021 at 1:45 AM explosion occurs in reactor R 25001 due to dangerous chemical reaction in content existing in it. Consequently, fire spread out in CM Plant thereby 7 workers died as well as 26 workers injured. In reactor R 25001 Hazardous Intermediate product kept as it is after taking the CM Plant in shut down. In this factory hazardous process is being carried out, in spite of it occupier / Factory Manager had not carried out well in advanced Reactivity Hazards Study / Instability Study / Compatibility Study / Storage Thermal Study / Safety & Health Hazards

Evaluation – careful analysis and thereby violated Pera 5 of Part–2 Schedule 19 of Gujarat Factories Rules 1963.

7. To Prevent such type of accident following steps to be carried out and inform to my office in writing.
   A. Considering all the P&ID of CM Plant as well as, all the plant, well in advance Reactivity Hazards Study / Instability Study / Compatibility Study / Storage Thermal Study / Safety & Health Hazards Evaluation – careful analysis to be carried out & Compliance report to be submitted to my office.
8. As per our inquiry in the factory, occupier of the factory is Mr. Arun C. Ashar and Factory Manager is Mr. Anil C. Mundada.
9. For the name mentioned in Remarks No:04, remaining salary, earn leave salary, Legal compensation & additional compensation of 7 died workers to be pay to the legal nominee of each died worker.
10. If there any clarification for the breach mentioned in Remarks No:6, submit to my office with the proof of the clarification within 7 days.

(N.D.VAGHELA)
Deputy Director
Industrial Safety & Health

Annexure - 8: Submissions of unit wrt Breach of law

UPL Limited, Unit - 5
Plot No.746 & 750, P.B. No.9
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
t: +91 2645 226013
f: +91 2645 226017

Ref : UPL/JHG/SAF/S/01/2021/09

Date : - 6th March 2021

To,

Dy. Director – Industrial Health & Safety

Office of the Dy. Director – (I.S. & H)

2nd Floor, Multi Story Building

Opp- Gayatri Nagar

Bharuch

Sub: Our response in compliance to your letter dydish / Bharuch / 2021 / 577 dated 05.03.2021

Dear Sir,

This has reference to the subject mentioned above.

Please find enclosed herewith the response to points no. 7and 9 for your consideration.

Point Nos	Recommendation	Reply/ Submission
07	To do Reactivity Hazard Study / Instability Hazard Study / Compatibility study / Storage Thermal study of Intermediate products / chemicals of CM plant along with all other plants at site by Expert / Competent agency considering P & ID and submit to DISH office	We have already initiated the process. We will carry out the necessary study / test for the WIPs for all plants as recommenced & will submit the reports to your good office.
09	Detail of compensation & salary paid to the families of 7 causalities	Details of compensation paid has already been submitted to your Bharuch DISH office on 05th March 21 via our letter ref no.- UPL /Jhg/SAF/S/01/2021/08. Copy attached for your ref & records.

Kindly acknowledge the receipt of this letter.

Thanking you

Yours faithfully

For, UPL Limited (Unit # 05)

6/3/2021

Anil Mundada

Unit Head

Enclosed copy :- Submitted copy of Compensation to families of causalities / presumed dead.

UPL
OpenAg™

UPL Limited, Unit - 5
Plot No.746 & 750, P.B. No.9
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
t: +91 2645 226013

Date: 2nd March, 2021

To,
Dy. Director of Factories,
Office of Director of Industrial Safety and Health,
Bharuch.

Subject: Compensation/Pay-out Details for Deceased Personnel arising out of the unforeseen incident on 23rd Feb 2021

Dear Sir,

Please refer to our previous communication on the subject dated 23rd Feb 2021.

We lost 07 personnel on that unfortunate night, details of the which are tabulated below.

Sr	Code	Name	Plant	Category	Status
1	1208670	KRUNAL PATEL	CM 257	Staff	Not found
2	1208741	Ketankumar Gevariya	CM 257	Staff	Death
3	1208780	VANRAJSINH DODIYA	CM 257	Staff	Death
4	1208963	NEHAL MEHATA	CM 257	Staff	Death
5	1000007906	KUVARLAL KOMAL KASDEKAR	CM 257	ROYAL SECURITY	Death
6	1000007907	MANIRAM SANTULAL DHIKARE	CM 257	ROYAL SECURITY	Not found
7	1000007969	KAMAL LAXMAN PANSE	CM 257	ROYAL SECURITY	Not found

Details of Compensation/Insurance/Statutory pay-outs is being attached as Appendix "A"

We have cleared ex-gratia & GPAI amount from our side. Processes for rest have also been initiated.

For, UPL Limited,

Authorized Signatory

o/c

5/3/2021

Encl.: Annexure – A

Annexure - A

UPL EMPLOYEE			Payment Done			Pending Payment				GRAND TOTAL	Remarks
Sr	Name of Deceased	Category	GPA	Ex-Gratia	TOTAL	F&F (Salary, Leave, Variable Pay & Bonus)	Gratuity	Term Insurance	Total		
1	Lt Ketankumar Gevariya	Company Employee	15,00,000	30,00,000	45,00,000	1,03,605	2,76,923	10,00,000	13,80,528	58,80,528	Required documents to initiate
2	Lt Vanrajsinh Dodiya	Company Employee	15,00,000	30,00,000	45,00,000	1,00,259	2,76,923	10,00,000	13,77,182	58,77,182	
3	Lt Krunal Patel	Company Employee	9,00,000	30,00,000	39,00,000	74,777	1,71,346	10,00,000	12,46,123	51,46,123	
4	Lt Nehal Mehta	Company Employee	13,00,000	30,00,000	43,00,000	69,726	2,62,500	10,00,000	13,32,226	56,32,226	
					1,72,00,000				Total - 1	2,25,36,059	

CONTRACT EMPLOYEE				Payment Done				Pending Payment	TOTAL	GRAND TOTAL	Remarks
Sr	Name of Deceased	Category	N.A.	Ex-Gratia	TOTAL	F&F (Wages, Leave,Gratuity,Bonus)	Gratuity (5 year considered)	Workmen compensation (Approx)			
1	Late Mr. Kuvarlal	Contract Employee		15,00,000	15,00,000	10,751	24,327	9,54,101	9,89,179	24,89,179	Required documents to initiate & WC Intimation done
2	Late Mr. Kamal	Contract Employee		15,00,000	15,00,000	11,036	24,327	9,32,986	9,68,349	24,68,349	
3	Late Mr. Maniram	Contract Employee		15,00,000	15,00,000	11,036	24,327	9,38,534	9,73,997	24,73,997	
					45,00,000	32,823	72,981		Total - 2	74,31,525	
									Total 1 & 2	2,99,67,584	
									Payment done	2,18,05,804	
									% Completed	73%	

* Apart from above payment the Legal Heir of deceased will also get claim from Employee Deposit Linked Insurance (EDLI), PF & Pension

For UPL LIMITED

AUTHORISED SIGNATORY

Annexure - 9: Details GPCB IR & AR of visit on 23/02/2021 and 02/03/2021

Major Accident Report

Name and address of Industry :	M/s. UPL Ltd (GPCB ID 25353), Plot No 750,746, GIDC Jhagadia, Ta Jhagadia, Dist Bharuch.
Subject :	Accident occurred in M/s. UPL Ltd., Plot No 750,746, GIDC Jhagadia, Ta Jhagadia, Dist Bharuch.dated on 23/02/2021
Product:	Agrochemicals (Pesticides) , Caustic chlorine , Power plant, etc.
GPCB Permission status	CC&A is obtained for manufacturing of above said product valid up to 19/11/2024.
Date and time of incident	23/02/2021, at @ 2:00 hrs. (2.00 a.m.)
Date and time of inspection :	23/02/2021 at 05:00 hrs. onwards.
Reason of incident	• The blast and fire occurred in CM-257 plant meant for manufacturing multiple products namely, Clethodim, Glyfosate & Glufosinate which involves use important raw materials like Croton Aldehyde, Tri Ethyl Amine, Methyl Aceto Acetate, Di-Methyl Melonate, DEA, PCL3, HCHO,HCL, NaOH, Tri Methyl Phosphite, P. Trichloride, solvent-TMB, Methyl Chloride, PBHF, Acrolidine, Sod. Cyanide etc. • As per the statement issued by the industry, the above said CM-257 plant was in shout down since 05.02.2021. As per the statement (enclosed copy), the prima facie reasons for the accident might be due to fire/explosion in solvent which again could be due to electric short-circuit.
Causality	• Although confirmed figures are awaited, based on preliminary information 26 persons are injured and hospitalized whereas 02 persons are dead and 05 persons are missing. 15 out of 26 injured persons are discharged from the hospital and 11 are under treatment. (statement enclosed)
Environmental issue	• Dense Smoke & VOCs emission in prevailing wind direction (NE-SW) • Generation of contaminated wastewater during firefighting operation.
Pollution level monitoring & sampling results	Air Quality: • During inspection VOC levels are measured by instant portable VOC meter (RIKEN KEIKI GX-6000) and general hydrocarbon levels are measured by dragger tube (Uniphos Precision Air Sampling pump ASP-21) at various locations including downwind directions, outside the premises. Details of is as per below mentioned table;

Location	Time	VOC levels (values in ppm)	hydrocarbon levels (values in ppm)
near main gate of this unit	05:00 Hrs.	8	10
@ 50 meter away from the fire incidence	05:10 Hrs.	12	8
Near gate no. 2 of the unit	08:00 Hrs.	12.6	5
at north side of the unit (fire incidence)	08:10 Hrs.	23.8	5
Dadheda (downwind side)	05:45 Hrs.	00	05
Navagam Kararvel, (downwind side)	06:10 Hrs.	00	03
Untiya, (downwind side)	06:30 Hrs.	00	03
Saradarpura (downwind side)	06:50 Hrs.	00	02

- AAQM is also carried out on the terrace of Jhgagadia Industry Association building, located near the industry, through RDS (Envirotech) for measuring PM10, SO2 & NOx, results are awaited.

<u>Water Quality:</u>

- Contaminated wastewater is generated during the firefighting exercise. Samples of contaminated water generated during firefighting are collected from various locations within & outside the premises (Photographs attached). Details is mentioned below;

- Total five nos. of contaminated water sample are collected (1) Accumulated waste water collected from storm water drain of the unit within plant premises (at 08:15 Hrs.), (2) contaminated water sample collected from the GIDC surface storm water drain passing at north side of the unit outside the unit premises (at 09:15 Hrs.) (3) contaminated water sample collected from the GIDC surface storm water storm drain near M/s. Lanxess India Pvt. Ltd. (at 11:20 Hrs.) as mentioned in sample detail in IR. (4) Sample collected (at 14:10 Hrs.) from natural drain leading to Boridra nallah near Kapalsadi village (Lat.21.671193 & long.73.123563) (5) sample collected (at 14:35 Hrs.)

	from natural drain leading to Boridra nallah near Gumanpura village road (Lat.21.679008 & long.73.107435). Summary • Maximum measured level of VOC near gate no. 2 of the unit is observed @ 12.6 ppm and at north side of the unit (fire incidence) in downwind direction VOC is observed @ 23.8 ppm. • General hydrocarbon at both locations i.e. near main gate of the unit and at backward side of the unit in downward wind direction it is observed @ up to 05 ppm. • Results of AAQM done with the help of RDS is awaited • The analysis of sample of contaminated water generated during firefighting is under process
Precautionary measures	• Ambient Air quality was measured in the downwind direction of the unit including, at the villages/habitats. Considering the results of the monitoring, evacuation was not needed. The fire was brought under control within 4 hours. • Huge quantity of contaminated wastewater got accumulated within premises, which was diverted in the guard ponds (cap. 12000 Kl) for further treatment and disposal into official outlet. • Fighter pumps and tankers were deployed to lift back the wastewater which entered into GIDC storm water drain outside the premises.
Reason for evacuation	• No evacuation in the surrounding areas of the unit is required. • Evacuation from the plant premises done for safety reasons.
Chemical involved	• Raw materials involved in manufacturing activity in this plant are mentioned in the para "Reason of incident" above.
Status	• Fire is extinguished and situation is almost under control at about 06:45 hrs. on 23.02.2021. • Lifting/diverting of contaminated wastewater to guard ponds/ ETP area is underway.
Observations :	• This unit is inspected with reference to explosion & fire incidence occurred on 23:02:2021 at about 2:00 hrs. Unit is engaged in manufacturing of various agrochemicals/ Pesticides technical and has obtained valid CCA of the Board for the same. • During inspection emission of dense smoke is observed due to the fire and firefighting activity is going on with the help of water and foaming agent. Firefighters from UPL & nearby industrial units of Jhagadia etc. are deployed in the activity. • The fire is progressively reducing as the firefighting activity is intensified.

	• Contaminated wastewater is generated due to the firefighting, which is accumulated in the storm water drains within and outside the premises. • Overall length of stretch of wastewater flowing in the GIDC drain & subsequently to natural drain (dry) is approximately 3.5 - 4 kms. However, the wastewater has not reached any agriculture field or live water body. • The fire was controlled within @ 4 hrs. i.e. by 6:30 hrs on the same day. • The production plant of CM-257 is badly damaged (photograph attached). The control room and MEE plant within the premises is also damaged. Considering the blast/fire of high intensity, there are chances of damage to the other plants located within premises as well as nearby industries.
Additional Information	• This accident has occurred due to lapses in safety precautions adopted by the industry that has resulted in air pollution and water pollution. • Unit has submitted the PLI policy valid up to 31.03.2021 • Photographs taken during inspection, accident report format and other details submitted by unit are attached herewith. • Unit is issued 3-day notice for the following points: • Your industry is inspected w.r.t. the accident occurred on 23.02.2021. You are directed to submit details of cause of accident and also take appropriate actions to avoid such incidents in future. • Contaminated wastewater and solid waste generated due to the Firefighting activity shall be collected and managed as per the permitted methods under intimation to this office. • Submit copy of Public Liability Insurance taken by you. • Submit report and written documents given by DISH to you. • Submit Accident Format (Form -11) to be submitted to GPCB under the Hazardous & Other Waste Management Rules-2016. • Submit records on stock of Solvent (raw material & Product), Hazardous Waste stored within premises at the time of the accident. • Submit results of sampling done by you to know Ambient Air Quality.
Name and designation of inspection team.	**-sd-** Nitin Tholia (APE) **-sd-** L.U.Kataria (SSA) **-sd-** B.A.Bhuva (AEE) **-sd-** S.B Patel (SO) **-sd-** R.R.Vyas (RO)

M/s. UPL Ltd, Plot No 750,746, GIDC Jhagadia, Ta Jhagadia, Dist Bharuch.

Fire is observed in plant area

Plant is found damaged due to fie incidence

M/s. UPL Ltd, Plot No 750,746, GIDC Jhagadia, Ta Jhagadia, Dist Bharuch.

Contaminated water is observed accumulated in storm water drain within unit premises

Contaminated water is coming out from the boundary wall of the unit at north side of unit area and going into GIDC storm water drain outside the unit

M/s. UPL Ltd, Plot No 750,746, GIDC Jhagadia, Ta Jhagadia, Dist Bharuch.

Photographs of waste water lifting activity by M/S UPL Ltd (Unit V)

Wastewater lifting from Gumanpura village

M/s. UPL Ltd, Plot No 750,746, GIDC Jhagadia, Ta Jhagadia, Dist Bharuch.

Contaminated water flowing is going on into GIDC storm water drain which is finally going into natural drain leading to Boridra Nallah

M/s. UPL Ltd, Plot No 750,746, GIDC Jhagadia, Ta Jhagadia, Dist Bharuch.

Bund wall making with JCB in nearby storm water drain.

Waste water has not reached up to Boridranala

GUJARAT POLLUTION CONTROL BOARD

Regional Office - Ankleshwar Cleaner Technology Development Centre Building (ARAIL),
1st Floor, Plot No. 1501, GIDC Estate, Ankleshwar - 393 002.
Dist. Bharuch (Gujarat) Ph. No. : (02646) 222933 Fax : (02646) 222932

તપાસ માટે દાખલ થવાની સૂચના (નોટીસ)

નંબર : GPCB ID: 25353 તારીખ : 23/02/2021

પાણી અધિનિયમ 1974ની કલમ-23, હવા અધિનિયમ 1981ની કલમ-24 અને પર્યાવરણ (સુરક્ષા) અધિનિયમ – 1986ની કલમ-10 હેઠળ અમોને મળેલ સત્તાની રૂએ અમો નીચે સહી કરનાર અમોને જરૂરી લાગે તેની સહાય લઈને તમામ સમયે નીચેના હેતુઓ માટે આપની જગ્યામાં દાખલ થવાનો અને તપાસ કરવાનો અધિકાર ધરાવીએ છીએ.

(1) અમોને સોંપેલા રાજ્ય બોર્ડ/કેન્દ્ર સરકારનાં કાર્ય બજાવવાના હેતુ માટે,

(2) આવા કોઈ કાર્યો બજાવવાના છે કે કેમ અને તેમ હોય તો કઈ રીતે તે બજાવવાના છે અથવા આ અધિનિયમ અથવા તે હેઠળ કરેલા નિયમોની અથવા આ અધિનિયમ હેઠળ બજાવેલી કોઈ નોટીસની, કરેલા કોઈ હુકમની, આદેશની અથવા આપેલા કોઈ અધિકારપત્રની કોઈ જોગવાઈનું પાલન કરવામાં આવી રહ્યું છે કે પાલન કરવામાં આવ્યું છે કે કેમ તે નક્કી કરવાના હેતુ માટે,

(3) કોઈ સાધન સામગ્રી, ઔદ્યોગિક પ્લાન્ટ, રેકર્ડ, રજીસ્ટર, દસ્તાવેજ અથવા અન્ય કોઈ મહત્વની વસ્તુની તપાસ કરવા અને તેની કસોટી કરવાના હેતુ માટે અથવા જે જગામાં તેને એમ માનવાને કારણ હોય કે આ બાબત કે તે હેઠળ કરેલા નિયમો મુજબ કોઈ ગુનો કરવામાં આવ્યો છે, અથવા થવાની તૈયારીમાં છે, તેવી કોઈ જગ્યાની ઝડતી લેવા માટે અને તેને એમ માનવાને કારણ હોય કે આ બાબત કે તે હેઠળ કરેલ નિયમો હેઠળ શિક્ષાપાત્ર કોઈ ગુનો કર્યાનો પુરાવો, તેવા સાધન સામગ્રી, ઔદ્યોગિક પ્લાન્ટ, રેકર્ડ, રજીસ્ટર, દસ્તાવેજ અથવા અન્ય કોઈ મહત્વની વસ્તુ કબજે લેવા માટે અમે નીચે જણાવેલ સમયે દાખલ થઈએ છીએ.

ઉદ્યોગ/કારખાનામાં દાખલ થવાનો સમય : સવારના/બપોરના 05:00 વા. 23/02/2021

અમારી સાથે સહાય માટે નીચેની વ્યક્તિઓ પણ છે.

1. [illegible]
2. [illegible]
3. [illegible]

પ્રતિ,

U.P.L. LTD [Unit-5]
Plot no. 7502, 750
G.I.D.C. Jhagadia
Dist. Bharuch

નકલ મળેલ છે.
[illegible]
આ સૂચના (નોટીસ) મેળવનારની સહી :-

સહી :-
અધિકારીનું નામ :- [illegible]
હોદ્દો :- [illegible]

ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ, પ્રાદેશિક કચેરી, અંકલેશ્વર

નોટીસ

આપના એકમની આજ મુલાકાત દરમ્યાન પર્યાવરણીય કાયદાઓ સંદર્ભે ગંભીર પ્રકારની ત્રુટિઓ/ક્ષતિઓ જોવા/જાણવા મળેલ છે, જે આધારે પગલાં લેતા પહેલા કુદરતી ન્યાયના સિધ્ધાંત મુજબ આપને સાંભળવાની તક પુરી પાડવાના હેતુથી નીચે જણાવેલ મુદ્દાઓ/સુચનાઓ પરત્વે આપનો લેખિત ખુલાસો/પુર્તતા અહેવાલ કામકાજના દિન-૩ માં બોર્ડની વડી કચેરી તથા પ્રાદેશિક કચેરીને રજુ કરવા નોટીસ પાઠવવામાં આવે છે.

૧. આજ રોજ આપના એકમની મુલાકાત લીધેલ ત્યારે (તા. ૨૩/૦૮/૨૦૨૧) દરમ્યાન આપના એકમમાં બનેલ Fire incident ના સંદર્ભમાં નિકાલ આવેલ જોખમી કચરા અને [illegible] નો નિયમોનુસાર [illegible] અત્રેની કચેરીમાં જમા કરાવવી, તથા આગ લાગવાનું Root cause analysis કરાવી તેને નિવારવા જરૂરી પગલા લેવા.

૨. [illegible] તથા ભવિષ્યમાં આગ ન લાગે તે માટેનું પુનરાવર્તન [illegible] contaminated [illegible] તથા Solid waste ને એકઠું કરી તેનો નિયમોનુસાર નિકાલ કરવો તેમજ તેનો આધારપુરાવા રજુ કરવા.

૩. આપના એકમ દ્વારા લેવામાં આવેલ Public Liability Insurance ની copy અત્રેની કચેરીમાં જમા કરાવવી.

૪. આગ લાગવાના બનાવ અંગે DISH નો રીપોર્ટ અત્રેની કચેરીમાં જમા કરાવવી.

૫. આપના દ્વારા Hazardous Waste Management Rules અંતર્ગત ભરવાનું થતું Accident Form (Form 11) અત્રેની કચેરીમાં જમા કરાવવું.

૬. આપના એકમમાં આગ લાગતા પહેલાની Solvent ([illegible]) તથા Product, Hazardous waste નો Stock, [illegible] આધારપુરાવા [illegible]

૭. આપના [illegible] જમા રીપોર્ટ અત્રેની કચેરીમાં જમા કરાવવા.

૮. આપના [illegible] Storm [illegible] નિયમોનુસાર [illegible]

ગુ.પ્ર.નિ. બોર્ડના નામે અને વતી,

L.V. Kulkarni S.B. Patel (JSA) (SO)

શ્રી દિપક ગાર્ડ
(નોટીસ મેળવનાર)
([illegible])

(R. R. Vyas)
(નોટીસ આપનાર)

ANALYSIS REPORT FOR AIR
TYPE : Ambient

Sample ID:299802 - **Analysis Completion:03/03/2021**

Pesticides (technical) (excluding formulation) / LAB Inward : **43449**

Gujarat Pollution Control Board
Bharuch
C-1/119/3, GIDC Phase-2
Narmadanagar
Bharuch-392015
Tele:(0264)2246333

1. Name &	**: UPL LIMITED (UNIT NO. 5) - 25353**
2. Address of the Unit	**: 750,746,, Jhagadia - 393110,Taluka : Jhagadia, District : Ankleshwar, GIDC : Jhagadia**
3. Nature of Sample	**: REP-Representative/Grab , (Insp Type : OTH-Others/Higher Authority)**
4. Sample Collected By	**: R.R.Vyas, Vigilance Head**
5. Date & Time of Collection & Receipt	**: 23/02/2021, (0900 to 1700)**
6. Date of Start & Completion of Analysis	**: 24/02/2021 & 03/03/2021**
7. Sampling Point	**: # Ambient Sampling Point ~ AAQMS carried out on the terrace of Jhagadia Industries As**
8. Fuel	**: ----**
9. APCM	**: ----**
10. Filter No & Weight	**: F.P no. 5 (lot.no 6978)**
11. Temperature on Collection	**: 27 & Volume-Absord Media : 25ML for Each SOX & NOx parameter**
12. Volume-Gas Passed	**: For PM 10 - 590.4 M3 , For Gases 240 lit for each four hours**
13. Parameters	**: 3 & Oper Time(Min) : 480 min(8 hrs.)**

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	SOX-Amb	MICROG/M3	IS: 5182 (Part - 2), 2001 (reaffirmed 2006)	5 – 1050 µg/M3	6.6
2	NOX-Amb *	MICROG/M3	-	-	48.12
3	PM10-Amb	MICROG/M3	IS: 5182 (Part - XXIII), 2006	1 – 1000 µg/M3	100

Laboratory Remarks : Approved By:236-lab_236 Dt.: 03/03/2021

D. N. Vasadia, Lab Head

Field Observation : intial weight of filter paper no. 5 (lot no. 6978) : 2.60900gm

n i c

12/04/2021

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID:299799 - Analysis Completion:03/03/2021

Pesticides (technical) (excluding formulation) / LAB Inward : 43448

Gujarat Pollution Control Board, Bharuch
C-1/119/3, GIDC Phase-2
Narmadanagar
Bharuch-392015
Tele:(0264)2246333

TC-7844

TEST REPORT

Test Report No. : 43448 **Date: 03/03/2021**

1. Name of the Customer	**: UPL LIMITED (UNIT NO. 5) - 25353**
2. Address	**: 750,746,, Jhagadia-393110, Taluka : Jhagadia, District : Ankleshwar, GIDC : Jhagadia**
3. Nature of Sample	**: REP-Representative/Grab, (Insp Type : OTH-Others/Higher Authority)**
4. Sample Collected By	**: R.R.Vyas, Vigilance Head**
5. Quantity of Sample Received	**: 5 lit**
6. Code No. of the Sample	**: 299799**
7. Date & Time of Collection & Inwarding	**: 23/02/2021 , (1435 to 1435) & 24/02/2021**
8. Date of Start & Completion of Analysis	**: 24/02/2021 & 03/03/2021**
9. Sampling Point	**: sample collected from natural drain leading to Boridra nallah near Gumanpura village**
10. Flow Details (Remarks)	**: Yes**
11. Mode of Disposal	**: Natural drain leading to Boridra nallah**
12. Ultimate Receiving Body	**: NCT JIE pipeline project**
13. Temperature on Collection	**: 29 & pH Range on pH Strip :@ 6 on pH strip**
14. Carboys Nos for	**: barcode & Color & Appearance :Light Yellow**
15. Water Consumption & W.W.G (KLPD)	**: Ind :11401.500 , Dom :205.000 & Ind :2614.000 , Dom :183.000**

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	29
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	6.98
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	15
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Method	10 – 200000 mg/L	1974
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Method	2 – 10000 mg/L	98
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	2.24
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	910
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	276
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	1435
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	28
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	0.26
12	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmed	05–50000 mg/l	288

Laboratory Remarks : Approved By:236-lab_236 Dt.: 03/03/2021

D. N. Vasadia, Lab Head

Field Observation : sample collected (at 14:35 hrs.) from natural drain leading to boridra nallah near gumanpura village road (lat.21.679008 & long.73.107435).

Note :

1. * - These parameters are NOT covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
4. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Board in writing.
5. The Board is not responsible for the authenticity for the samples not collected by the Board's officials.
6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

N I C

12/04/2021

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID:299798 - Analysis Completion:03/03/2021

Pesticides (technical) (excluding formulation) / LAB Inward : 43447

Gujarat Pollution Control Board, Bharuch
C-1/119/3, GIDC Phase-2
Narmadanagar
Bharuch-392015
Tele:(0264)2246333

TC-7844

TEST REPORT

Test Report No. : 43447 **Date: 03/03/2021**

1. Name of the Customer	**: UPL LIMITED (UNIT NO. 5) - 25353**
2. Address	**: 750,746,, Jhagadia-393110, Taluka : Jhagadia, District : Ankleshwar, GIDC : Jhagadia**
3. Nature of Sample	**: REP-Representative/Grab, (Insp Type : OTH-Others/Higher Authority)**
4. Sample Collected By	**: R.R.Vyas, Vigilance Head**
5. Quantity of Sample Received	**: 5 lit**
6. Code No. of the Sample	**: 299798**
7. Date & Time of Collection & Inwarding	**: 23/02/2021 , (1410 to 1410) & 24/02/2021**
8. Date of Start & Completion of Analysis	**: 24/02/2021 & 03/03/2021**
9. Sampling Point	**: Sample coll. from natural drain leading to Boridra nallah near Kapalsadi village ~**
10. Flow Details (Remarks)	**: Yes**
11. Mode of Disposal	**: Natural drain leading to Boridra nallah**
12. Ultimate Receiving Body	**: NCT JIE pipeline project**
13. Temperature on Collection	**: 28 & pH Range on pH Strip :@ 6 on pH strip**
14. Carboys Nos for	**: barcode & Color & Appearance :Light Yellow**
15. Water Consumption & W.W.G (KLPD)	**: Ind :11401.500 , Dom :205.000 & Ind :2614.000 , Dom :183.000**

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	28
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	6.89
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	15
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Method	10 – 200000 mg/L	1074
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Method	2 – 10000 mg/L	140
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	1.12
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	517
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	234
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	970
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	28.8
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	0.04
12	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmed	05–50000 mg/l	105

Laboratory Remarks : Approved By:236-lab_236 Dt.: 03/03/2021

D. N. Vasadia, Lab Head

Field Observation : sample collected (at 14:10 hrs.) from natural drain leading to boridra nallah near kapalsadi village (lat.21.671193 & long.73.123563)

Note :

1. * - These parameters are NOT covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
4. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Board in writing.
5. The Board is not responsible for the authenticity for the samples not collected by the Board's officials.
6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

N I C

12/04/2021

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID:299795 - Analysis Completion:03/03/2021

Pesticides (technical) (excluding formulation) / LAB Inward : 43446

Gujarat Pollution Control Board, Bharuch
C-1/119/3, GIDC Phase-2
Narmadanagar
Bharuch-392015
Tele:(0264)2246333

TC-7844

TEST REPORT

Test Report No. : 43446 **Date: 03/03/2021**

1. Name of the Customer : UPL LIMITED (UNIT NO. 5) - 25353
2. Address : 750,746,, Jhagadia-393110, Taluka : Jhagadia, District : Ankleshwar, GIDC : Jhagadia
3. Nature of Sample : REP-Representative/Grab, (Insp Type : OTH-Others/Higher Authority)
4. Sample Collected By : R.R.Vyas, Vigilance Head
5. Quantity of Sample Received : 5 lit
6. Code No. of the Sample : 299795
7. Date & Time of Collection & Inwarding : 23/02/2021 , (1120 to 1120) & 24/02/2021
8. Date of Start & Completion of Analysis : 24/02/2021 & 03/03/2021
9. Sampling Point : contaminated water sample coll. from GIDC storm water storm drain Nr. M/s. Lanxes
10. Flow Details (Remarks) : Yes
11. Mode of Disposal : Natural drain leading to Boridra nallah
12. Ultimate Receiving Body : NCT JIE pipeline project
13. Temperature on Collection : 29 & pH Range on pH Strip :@ 6 on pH strip
14. Carboys Nos for : & Color & Appearance :Light Yellow
15. Water Consumption & W.W.G (KLPD) : Ind :11401.500 , Dom :205.000 & Ind :2614.000 , Dom :183.000

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	29
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	6.67
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	10
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Method	10 – 200000 mg/L	676
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Method	2 – 10000 mg/L	30
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	2.8
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	329
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	123
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	608
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	23.6
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	0.02
12	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmed	05–50000 mg/l	80

Laboratory Remarks : Approved By:236-lab_236 Dt.: 03/03/2021

D. N. Vasadia, Lab Head

Field Observation : contaminated water sample collected from the gidc surface storm water storm drain near m/s. lanxess india pvt. ltd. (at 11:20 hrs.) as mentioned in sample detail in ir.

Note :

1. * - These parameters are NOT covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
4. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Board in writing.
5. The Board is not responsible for the authenticity for the samples not collected by the Board's officials.
6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

N I C

12/04/2021

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID:299793 - Analysis Completion:03/03/2021

Pesticides (technical) (excluding formulation) / LAB Inward : 43445

Gujarat Pollution Control Board, Bharuch
C-1/119/3, GIDC Phase-2
Narmadanagar
Bharuch-392015
Tele:(0264)2246333

TC-7844

TEST REPORT

Test Report No. : 43445 **Date: 03/03/2021**

1. Name of the Customer	**: UPL LIMITED (UNIT NO. 5) - 25353**
2. Address	**: 750,746,, Jhagadia-393110, Taluka : Jhagadia, District : Ankleshwar, GIDC : Jhagadia**
3. Nature of Sample	**: REP-Representative/Grab, (Insp Type : OTH-Others/Higher Authority)**
4. Sample Collected By	**: R.R.Vyas, Vigilance Head**
5. Quantity of Sample Received	**: 5 lit**
6. Code No. of the Sample	**: 299793**
7. Date & Time of Collection & Inwarding	**: 23/02/2021 , (0915 to 0915) & 24/02/2021**
8. Date of Start & Completion of Analysis	**: 24/02/2021 & 03/03/2021**
9. Sampling Point	**: contaminated water sample coll. from GIDC storm water drain outside passing at nor**
10. Flow Details (Remarks)	**: Yes**
11. Mode of Disposal	**: into GIDC storm drain**
12. Ultimate Receiving Body	**: NCT JIE pipeline project**
13. Temperature on Collection	**: 30 & pH Range on pH Strip :@ 6 on pH strip**
14. Carboys Nos for	**: barcode & Color & Appearance :Light Yellow**
15. Water Consumption & W.W.G (KLPD)	**: Ind :11401.500 , Dom :205.000 & Ind :2614.000 , Dom :183.000**

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	30
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	6.23
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	15
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Method	10 – 200000 mg/L	994
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Method	2 – 10000 mg/L	62
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/L	10.08
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	440
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	161
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	1932
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	46.4
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	0.17
12	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmed	05–50000 mg/l	383

Laboratory Remarks : Approved By:236-lab_236 Dt.: 03/03/2021

D. N. Vasadia, Lab Head

Field Observation : contaminated water sample collected from the gidc surface storm water drain passing at north side of the unit outside the unit premises (at 09:15 hrs.)

Note :

1. * - These parameters are NOT covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
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6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

N I C

12/04/2021

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID:299790 - Analysis Completion:03/03/2021

Pesticides (technical) (excluding formulation) / LAB Inward : 43444

Gujarat Pollution Control Board, Bharuch
C-1/119/3, GIDC Phase-2
Narmadanagar
Bharuch-392015
Tele:(0264)2246333

TC-7844

TEST REPORT

Test Report No. : 43444 **Date: 03/03/2021**

1. Name of the Customer	**: UPL LIMITED (UNIT NO. 5) - 25353**
2. Address	**: 750,746,, Jhagadia-393110, Taluka : Jhagadia, District : Ankleshwar, GIDC : Jhagadia**
3. Nature of Sample	**: REP-Representative/Grab, (Insp Type : OTH-Others/Higher Authority)**
4. Sample Collected By	**: R.R.Vyas, Vigilance Head**
5. Quantity of Sample Received	**: 5 lit**
6. Code No. of the Sample	**: 299790**
7. Date & Time of Collection & Inwarding	**: 23/02/2021 , (0815 to 0815) & 24/02/2021**
8. Date of Start & Completion of Analysis	**: 24/02/2021 & 03/03/2021**
9. Sampling Point	**: Accumulated waste water collected from storm water drain of the unit within plant pre**
10. Flow Details (Remarks)	**: Yes**
11. Mode of Disposal	**: into GIDC storm drain**
12. Ultimate Receiving Body	**: NCT JIE pipeline project**
13. Temperature on Collection	**: 30 & pH Range on pH Strip :@ 6 on pH strip**
14. Carboys Nos for	**: barcode & Color & Appearance :Light Yellow**
15. Water Consumption & W.W.G (KLPD)	**: Ind :11401.500 , Dom :205.000 & Ind :2614.000 , Dom :183.000**

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	30
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	6.42
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	15
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Method	10 – 200000 mg/L	794
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Method	2 – 10000 mg/L	48
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	BDL
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	334
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	75
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	1272
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	187.2
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	0.02
12	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirme	05–50000 mg/l	258

Laboratory Remarks : Approved By:236-lab_236 Dt.: 03/03/2021

D. N. Vasadia, Lab Head

Field Observation : accumulated waste water collected from storm water drain of the unit within plant premises (at 08:15 hrs.)

Note :

1. * - These parameters are NOT covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
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6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

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12/04/2021

Inspection report

Reference	:	To check post monitoring effect of nearby areas of M/s. UPL Ltd with respect to waste water management, in continuation of aaccident occurred in M/s. UPL Ltd, GIDC Jhagadia, Tal: Jhagadia, Dist: Bharuch on dated 23/02/2021
PCB ID		25353
Date & Time	:	02/03/2021, 16:10 Hrs onwards
Person contacted	:	(1) Shri Ajay Pancholi, Sr.manager-Env from M/s. UPL Ltd (unit-5), Jhagadia (2) Deepak kumar Saumshi, Env Head from M/s. UPL Ltd (unit-5), Jhagadia

Observation:

⇒ Inspection is carried out along with above mentioned representative from M/s. UPL Ltd (unit-5), Jhagadia to check post impact/ effect due to waste water going outside the GIDC area i.e. in natural Boridra nallah.

⇒ During this inspection, we have not done plant visit of M/s. UPL Ltd and specifically taken round of outside the area of M/s. UPL Ltd (unit-5) from where contaminated waste water generated during fire frightening activity went from boundary wall in to GIDC storm water drain and ultimately in to natural drain (Boridra nallah). Following locations are visited during inspection.

⇒ **Location: 1 – Northern side Boundary wall of M/s. UPL Ltd (unit-5)**
At the time of inspection, we have first visit to the location of northern side boundary wall of M/s. UPL Ltd (unit-5) from where contaminated waste water were going outside on dated 23/02/202. At the time of inspection, no any contaminated waste water observed coming outside from the unit boundary wall at northern side. Earlier made bund wall in GIDC storm water drain is found as it is in both corner of northern side road.

⇒ **Location: 2 – Lanxess corner from where GIDC storm water drain meets to Boridra nallah (starting point of nallah)**
During visit GIDC storm water drain is completely dry at this location. Natural drain leading to boridra nallah in front of lanxess which is other side of Road is observed in dry condition.

⇒ **Location: 3 –Natural drain leading to Boridra nallah near Kapalsadi village (Lat.21.671193 & long.73.123563)**
During visit natural drain at this location is found completely dry, from where earlier water sample is collected. Bund wall prepared earlier is found as it is condition.

⇒ **Location: 4 – At Gumanpura village road Bridge**
During visit natural drain at this location is found completely dry. During visit one soil sample is collected from this location for analysis purpose. Earlier Bund wall was prepared at this location is broken and unit has excavate upper layer soil from this natural nallah and send to TSDF BEIL as said by person contacted.

⇒ **Location: 5 – Natural drain leading to Boridra nallah near Gumanpura village road (Lat.21.679008 & long.73.107435)**
During visit natural drain at this location is found completely dry, from where earlier water sample is collected.

⇒ **Location: 6 –Boridra nallah infront of M/s. Borosil Ltd.**
During visit natural drain at this location is found completely dry.

Photographs showing before after view of above said location is attached here with.

Name & Designation of Inspection officer	--sd-- Bhumika Bhuva (AEE)	--sd-- S.B.Patel (SO)

Photographs taken during inspection

Location: 1 – Northern side Boundary wall of M/s. UPL Ltd (unit-5)

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 2 – Lanxess corner from where GIDC storm water drain meets to Boridra nallah

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 3 –Natural drain leading to Boridra nallah near Kapalsadi village (Lat.21.671193 & long.73.123563)

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 4 – At Gumanpura village road Bridge

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 5 – Natural drain leading to Boridra nallah near Gumanpura village road (Lat.21.679008 & long.73.107435)

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

Location: 6 –Boridra nallah infront of M/s. Borosil Ltd.

Before (On dt.23/02/2021)

After (On dt.02/03/2021)

ANALYSIS REPORT FOR Hazardous
WATSE TYPE : S+O

Sample ID:300750 - Analysis Completion 23/03/2021

Pesticides (technical) (excluding formulation) / LAB Inward : 43572

Gujarat Pollution Control Board
Bharuch
C-1/119/3, GIDC Phase-2
Narmadanagar
Bharuch-392015
Tele:(0264)2246333

1. Name & : **UPL LIMITED (UNIT NO. 5) - 25353**
2. Address of the Unit : **750,746,,**
Jhagadia - 393110 , Taluka : Jhagadia, District : Ankleshwar, GIDC : Jhagadia
3. Nature of Sample : **REP-Representative/Grab , (Insp Type : OTH-Others/Higher Authority)**
4. Sample Collected By : **S.B.Patel,SO**
5. Date & Time of Collection & Receipt : **03-Mar-2021, (1700 to 1700)**
6. Date of Start & Completion of Analysis : **06/03/2021 15:20:25 & 23/03/2021**
7. Sampling Point : **Soil sample collected near Gumanpura village road bridge from the bottom of Boridra nal**
8. Physical State : **Solid+Semi**
9. Disposal Mode : **------**
10. Waste Category : **----**
11. Temperature on Collection : **- & Color & Appearance : Brownish**
12. Hazardous Sampled (SPM-M3) : **------- & Carboys Marks : Barcode**

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	pH	Unit	4500 B APHA Std.Methods 22nd edi.-2012	1 – 14	7.05
2	Chemical Oxygen Demand	gm/kg	APHA (22nd Edition)- 5220 B Open Reflux Method	5.0- 50000 &	0.39
3	Total Organic Carbon *	gm/kg	-	-	0.103
4	Phenolic Compounds *	gm/kg	4 Amino Antipyrene method without Chloroform Ext	1 – 50 mg/l	BDL

Laboratory Remarks : Approved By:236-lab_236 Dt.: 23/03/2021

D. N. Vasadia, Lab Head

Field Observation : parameters for finger printing analysis as below: (urgent)

n i c

12/04/2021

1. ~~clethodim~~
2. crotonaldehyde
3. ethyl mercaptan
4. triethyl amine
5. methyl acetoacetate
6. methyl piperidiene
7. dimethyl amino phridiene
8. toluene
9. mibk
10. n-hexane
11. ethyl acetate
12. hydroxyl amine sulphate
13. dichloromethane
14. di methylmelonate
15. propionic anhydrite
16. methanol
17. benoxacor
18. gluphosinate
19. glyphosate
20. 3-ethylthio butanal
21. 6-ethylthio-3-hetane-2-one
22. methyl 6-[2-(ethylsulfanyl) propyl]-4-hydroxy-2-oxocyclohex-3-ene-1-carboxylate
23. acetyl hydroxyl amine
24. acetyl chloro propenyl hydroxyl amine

GUJARAT POLLUTION CONTROL BOARD
REGIONAL OFFICE: BHARUCH
TEST REPORT

Name of the Unit	UPL LIMITED(Unit-5) plot no 750,746, GIDC Jhagadia, Dist Bharuch(GPCB ID-25353)						
L.R. No. Bharuch	2537	2538	2539	2540	2541	2647	2648
L.R. No. Gandhinagar	1610	1611	1612	1613	1614	1615	1616
Source	Accumulated waste water collected from storm water drain of the unit within plant area	Accumulated waste water collected from GIDC storm water drain outside passing at nor	Contaminated water sample collected from storm water drain Nr. M/s Lanxes	Sample collected from natural drain leading to Boridra nalih near kapalsadi village	Sample collected from natural drain leading to Boridra nalih near Gumanpura village	From ponding observed in Boridra nallah in Gumanpura village	From UPL Ltd old ETP guard pond
Date & time of collection of sample	23/02/2021 0815 Hrs	23/02/2021 0915 Hrs	23/02/2021 1120Hrs	23/02/2021 1410 Hrs	23/02/2021 1435 Hrs	04/03/2021 1645 Hrs	04/03/2021 1850 Hrs
pH Unit	6.42	6.23	6.67	6.89	6.98	7.65	7.44
Colour Pt.Co.Sc	15	15	10	15	15	—	—
TDS mg/lt	794	994	676	1074	1974	—	—
SS mg/lt	48	62	30	140	98	—	—
NH3-N mg/lt	BDL	10.08	2.8	1.12	2.24	BDL	19.6
Chloride mg/lt	334	440	329	537	910	—	—
Sulphate mg/lt	75	161	123	234	276	—	—
COD mg/lt	1272	1932	608	970	1435	378	1744
Phemolic Compound mg/lt	0.02	0.17	0.02	0.04	0.26	BDL	BDL
TOC mg/lt	—	—	—	—	—	91.5	452
oil & grease mg/lt	187.2	46.4	23.6	28.8	28	7.2	122.8
BOD(3day 27°) mg/lt	256	383	80	105	288	53	330
Toluene	BDL	BDL	BDL	0.08 mg/l	BDL	BDL	BDL
MIBK	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Hexane	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl acetate	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dichloromethane	BDL	BDL	BDL	0.24 mg/l	BDL	BDL	BDL
Methanol	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Probable list of compounds identified in GC-MS

	1(-ACETAMIDE, 2-CHLORO-N-(2-ETHYL-6-METHYLPHENYL)-N-(2-METHOXY-1-METHY	ACETAMIDE, 2-CHLORO-N-(2-ETHYL-6-METHYLPHENYL)-N-(2-METHOXY-1-METHY	ACETAMIDE, 2-CHLORO-N-(2-ETHYL-6-METHYLPHENYL)-N-(2-METHOXY-1-METHY	ETHANOL, 1-(2-BUTOXYETHOXY)	(ACETAMIDE, 2-CHLORO-N-(2-ETHYL-6-METHYLPHENYL)-N-(2-METHOXY-1-METHY	ACETAMIDE, 2-CHLORO-N-(2-ETHYL-6-METHYLPHENYL)-N-(2-METHOXY-1-METHY	ACETAMIDE, 2-CHLORO-N-(2-ETHYL-6-METHYLPHENYL)-N-(2-METHOXY-1-METHY
	E-14-HEXADECENAL	3,5-CYCLOHEXADIENE-1,2-DIONE, 3,5-BIS(1,1-DIMETHYLETHYL)-	3,5-CYCLOHEXADIENE-1,2-DIONE, 3,5-BIS(1,1-DIMETHYLETHYL)-	PROPANE, 1,2-BIS(ETHYLTHIO)-	3,5-CYCLOHEXADIENE-1,2-DIONE, 3,5-BIS(1,1-DIMETHYLETHYL)-	E-14-HEXADECENAL	
		E-14-HEXADECENAL		PROPIONIC ACID, 3-(ISOBUTYLTHIO)-			
				ACETAMIDE, 2-CHLORO-N-(2-ETHYL-6-METHYLPHENYL)-N-(2-METHOXY-1-METHY			
				3,5-CYCLOHEXADIENE-1,2-DIONE, 3,5-BIS(1,1-DIMETHYLETHYL)-			
				DIISODECYL ADIPATE			
				2-THIAZOLOXYECARBOXYLIC ACID			

D.N.Vasadia
SSO & Lab Head
Regional Lab Bharuch

Dr S N Agravat
SSO & Lab Head
Central Laboratory-Gandhinagar

GUJARAT POLLUTION CONTROL BOARD
REGIONAL OFFICE; BHARUCH

TEST REPORT

Name of the Unit	UPL LIMITED(Unit-5) plot no 750,746, GIDC Jhagadia, Dist Bharuch(GPCB ID-25353)						
L.R. No. Bharuch	H-54	H-55	H-56	H-57	H-58	H-59	H-60
L.R. No. Gandhinagar	H-44	H-45	H-46	H-47	H-48	H-49	H-50
Source	Soil sample collected near Gumanpura village road bridge	Reference soil sample near gumanpura village bridge	Soil sample collected near gumanpura village road bridge from the bottom of Boridra nallah	Soil sample collected near Gumanpura village road bridge	Soil sample collected in Gumanpura village road bridge	Soil sample collected near gumanpura village road bridge	Humic solid waste sample collected from stair of Raw material storage yard near CCOE
Date & time of collection of sample	04/03/2021 1640 Hrs	04/03/2021 1725 Hrs	04/03/2021 1700 Hrs	04/03/2021 1720 Hrs	04/03/2021 1650 Hrs	04/03/2021 1710 Hrs	09/03/2021 1300 Hrs
pH Unit	7.61	7.58	7.05	7.32	7.11	7.42	1.45
NH3-N gm/kg	BDL	BDL	_	BDL	BDL	BDL	56.11
COD gm/kg	0.43	1.02	0.39	0.65	0.6	0.26	1.47
Phenolic Compound gm/kg	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TOC gm/kg	0.099	0.168	0.103	0.0865	0.072	0.0357	0.286
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MIBK	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Hexane	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl acetate	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dichloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methanol	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Probable list of compounds identified in GC-MS							
	N-HEXADECANOIC ACID	N-HEXADECANOIC ACID	E-14-HEXADECENAL	N-HEXADECANOIC ACID	N-HEXADECANOIC ACID	E-14-HEXADECENAL	CYCLOTETRASILOXANE, OCTAMETHYL-
	1,2-BENZENEDICARBOXYLIC ACID, MONO(2-ETHYLHEXYL) ESTER	1,2-BENZENEDICARBOXYLIC ACID, MONO(2-ETHYLHEXYL) ESTER		1,2-BENZENEDICARBOXYLIC ACID, MONO(2-ETHYLHEXYL) ESTER	1,2-BENZENEDICARBOXYLIC ACID, MONO(2-ETHYLHEXYL) ESTER	ACETAMIDE, 2-CHLORO-N-(2-ETHYL-6-METHYLPHENYL) N-(2-METHOXY-1-METHY	
		E-14-HEXADECENAL		E-14-HEXADECENAL	E-14-HEXADECENAL		

D.N.Vasadia
SSO & Lab Head
Regional Lab Bharuch

Dr S N Agravat
SSO & Lab Head
Central Laboratory-Gandhinagar

Annexure - 10: Manifest copy of dredged soil near Gumanpura village

Bharuch Enviro Infrastructure Ltd.
(Tsdf) [14983]

Manifest No: 1266816
01/03/2021

Copy 1

Ann - 9

To be forwarded by To be forwarded by the occupier to the State Pollution Control Board or Committee.

Sender's Details					
Sender Name	**UPL LIMITED (UNIT NO. 5) [25353]**				
Address	, Taluka :JHA Distict:ANK Pin no:393110				
Contact Details	7069097475 Env.PL05@upl-ltd.com	**GPS Coordinates**	**Lat :**21.3800 **Long :**73.0700		
Receiver's Details					
State	Gujarat	**Type of Facility**	Common HWIF		
Facility Details	Bharuch Enviro Infrastructure Ltd.(Tsdf) [14983]				
Contact Details	9909994959 dalwadibd@beil.co.in	**GPS Coordinates**	**Lat :**21.6200 **Long:**73.0500		
Address	--- 9401-9412,9501-9506,7905 E to H, GIDC,Ankleshwar,---- Taluka :ANK Distict:ANK Pin no:393002				
Waste Details					
Waste Details	I~29~29.1~Process wastes or residues				
Waste Intended for	Incineration	**Total Qty**	17.930MT	**Consistency**	liquid
Transporter Details					
Name	SHIVAM ROADLINES	**Contact Details**	9227557377 shivamroadlines77@gmail.com		
Address	plot no 144/151padhmavti nagar rajpipla road ,ANKLESHWAR District :Bharuch Taluka :Bharuch				
Vehicle Details					
Vehicle no	GJ06XX6777	**GPS Enabled**	Yes	**Type of Vehicle**	Tanker
Driver name	SHAILENDRA PAL	**Driver Contact No**	9574501693		
Waste Transportation Details					
Vehicle Depart.	01/03/2021 6:00PM	**Number of Drums**	0	**Loose Waste**	17.930
Remarks	This is cm plant material after fire for incineration		**No of bags**	0	

Sender's Declaration :

1. I hereby declare that contents of the consignment are fully and accurate described above by proper shipping name and are categorized , packed, marked , and labeled , and are all in all respects in proper condition for transport by road according to applicable national government regulations.
2. I hereby declare that we have obtained membership of common facility / carried out agreement with actual user for disposal/ actual use of hazardous waste.

Name and stamp of sender: **Date:** 01/03/21 **Signature:**

Transporter's Acknowledgement of Receipt of waste
Stamp: **Date:** **Signature:**

Receiver's Certification of Receipt of Hazardous waste

Stamp: **Date:** **Signature:**

Print by 25353 @ 01/03/2021 06:12:02 PM 1 (Through XGN) N 1 C

BEIL INFRASTRUCTURE LIMITED

Site: Plot No. 9701-9716, GIDC, Ankleshwar. Dist. Bharuch.

PCB ID : 14983

GATE PASS FOR HAZARDOUS WASTE

Incl. No. 10090

1.	Sender's name and mailing address (including Phone No. and e-mail) :	UPL LIMITED (UNIT-5) 750, G.I.D.C., Post Box No.9, Jhagadia-393 110, Dist. Bharuch.
2.	Sender's authorisation No. :	
3.	XGN Document No. :	
4.	Transporter's name and address (including Phone No. and e-mail) :	
5.	Type of vehicle :	(Truck / Dumper / Special Vehicle) Tanker
6.	Transporter's registration No. :	
7.	Vehicle registration No. :	GJ06XX6777.
8.	Receiver's Name and mailing address (including Phone No. and e-mail) :	BEIL INFRASTRUCTURE LIMITED Site : Plot No. 9701-9716, GIDC, Ankleshwar, Dist. Bharuch. Ph. : 02646 - 225228 / 253135
9.	Waste Generator's PCB ID :	
10.	Waste description :	This is can material after fire for Incineration
11.	Total quantity : No. of Containers :	17.93 m³ or MT 1 Nos.
12.	Physical form :	(Solid / Semi - Solid / Sludge / Oily / Tarry / Slurry / Liquid)
13.	Special handling instructions and additional information :	use proper PPEs
14.	Sender's Certificate :	I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are categorised, packed, marked, and labelled, and are in all respects in proper conditions for transport by road according to applicable national government regulations.
	Name and stamp : UPL LIMITED (UNIT-5) 750, G.I.D.C., Post Box No.9, Jhagadia-393 110, Dist. Bharuch. Signature	Day Month Year 01 03 2021
15.	Transporter acknowledgment of receipt of Wastes	
	Name and stamp : Signature	Day Month Year
16.	Receiver's certification for receipt of hazardous waste	
	Name and stamp : BEIL INFRASTRUCTURE LIMITED Phone No. : (02646) 225228, 253135 Fax No. : (02646) 222849 Gate Pass Valid for 3 Months From the Date of Issue 04 FEB 2021 Signature	Day Month Year

FOR INCINERATION

WHITE COPY

UPL Limited, Unit - 5
Plot No.746 & 750, P.B.No. 9
GIDC, Dist. Bharuch
Jhagadia 393 110, Gujarat, India

w: upl-ltd.com
t: +91 2645 226013
f: +91 2645 226017

Certificate of Analysis

DATE: 06.03.2021

PRODUCT:	RM Holding N-Hexane
Date of Sampling	01.03.2021
Date of Analysis	05.03.2021
Storage	Tanker No: GJ 06 XX-6777
Qty(MT)	17.93

Analysis Result

Sr.No.	Tests	UOM	Result
1	Appearance	Visual	Hazy Liquid
2	N-hexane	%A/A	87.11

Remarks: Material not Suitable for Plant Use.

For UPL Limited	For UPL Limited	For UPL Limited
Prepared by:	**Verified by:**	**Approved by:**
Pratin Patel	Dr. Rajiv Tomar	M.D.Vachhani
(Executive - QA)	(Sr.Manager - QA)	(GM-QA)

Annexure - 11: GPCB Direction

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar**-382 010
Phone : (079) 23226295
Fax : (079) 23232156
Website : www.gpcb.gov.in

BY R.P.A.D.

CLOSURE DIRECTION UNDER SECTION 31-A OF THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT-1981 [HEREINAFTER REFERRED TO AS THE AIR ACT] AS AMENDED FROM TIME TO TIME

WHEREAS you are having an industrial plant at **Plot No: 750,746, GIDC JHAGADIA, DIST.BHARUCH.**

AND WHEREAS Gujarat Pollution Control Board has granted you consent under the provisions of Air Act-1981 by its Consent Order No.AWH -94827, valid up to 19/11/2024 for operation of the industrial plant with various conditions mentioned therein.

AND WHEREAS during the inspection of your industrial plant on **23/02/2021** under section-24 of the Air Act by the authorized officer of the Board it has been noticed that:

1. Blast and Fire occurred in CM-257 plant in the factory premises.
2. Due to this accident, as per preliminary information, 26 persons are injured and hospitalized whereas 02 persons are dead and 05 persons are missing.
3. Dense Smoke & VOCs emission in prevailing wind direction (NE-SW) is observed.
4. During inspection VOC levels are measured by instant portable VOC meter and general hydrocarbon levels are measured by dragger tube at various locations and the results measured are near main gate of unit, VOC level - 8 ppm, hydrocarbons- 10 ppm, @ 50 meter away from fire incidence VOC level- 12 ppm, hydrocarbons- 8 ppm, Near gate no. 2 of unit VOC level- 12.6 ppm, hydrocarbons- 5 ppm, at north side of unit (fire incidence)- VOC level- 23.8 ppm, hydrocarbons- 5 ppm. Hydro carbon levels measured at downwind side at (i) Dedheda : 05 ppm, (ii) Navagamkararvel : 03 ppm, (iii) Untiya : 03 ppm, (iv) Saradarpura : 02 ppm.
5. Contaminated wastewater is generated due to the firefighting, which is accumulated in the storm water drains within and outside the premises. Overall length of stretch of wastewater flowing in the GIDC drain & subsequently to natural drain (dry) is approximately 3.5 - 4 kms.
6. The production plant of CM-257 is badly damaged. The control room and MEE plant within the premises is also damaged. Considering the blast/fire of high intensity, there is damage to the other plants located within premises as well as nearby industrial plant. (as per DISH report)

7. This accident has occurred due to lapses in safety precautions adopted by the industry that has resulted in air pollution and water pollution.

AND WHEREAS the non-compliance found during the visit seems severe and damaged environment adversely.

AND WHEREAS the non-compliance as narrated above, observed in your industry is contributing to the pollution problem in Jhagadia area.

UNDER THE CIRCUMSTANCES, as directed, I M. P. Solanki, Dy. Environment Engineer, Gujarat Pollution Control board issue the direction under Section 31(A) of the Air Act – 1981 as under:

1. To prohibit the manufacturing activity on **immediately** at **Plot No: 750,746, GIDC Jhagadia**, DIST.BHARUCH.
2. To stop operation of D.G. set and CPP(if any) with immediate effect.
3. To close the operation of your industrial plant on the above mentioned site with immediate effect.
4. To direct the concerned authority to stop supply of electricity and water with immediate effect.
5. This order will be effective with immediate effect.
6. To submit accident report in the prescribed format to concerned authority as per MSIHC rules 1989.
7. To take all necessary safety measures by removing all remaining In-process material/ intermediate materials considering requisite process safety aspects.
8. To collect contaminated wastewater generated from fire fighting activity which is observed being discharged into GIDC surface storm water drainage.
9. To ensure safe collection of spilled residues of chemicals / hazardous & other wastes generated from accident, and dispose the same as per provisions of hazardous waste rules under intimation to the board.
10. To take all necessary measures to ensure safety of all reactors, equipment etc. to prevent further mishappening and environmental damage at the earliest.
11. To carry out safety audit/ HAZOP study that shall include environment aspects at the earliest and submit the same to the board.
12. To submit compliance report of the instructions / direction issued by DISH wrt above accident.

COPY TO:

1. **The Dy. Engineer (O&M)**
   Dakshin Gujarat Vij Company Ltd (DGVCL),
   Industrial Sub-Division office, DGVCL,
   Near O.N.G.C.,
   Ankleshwar, Dist. Bharuch .....
   I am directed to request you to disconnect supply of **ELECTRICITY** (except single phase) with **immediate effect** from the date of issue of this order to the industrial plant of **M/s. UPL LTD. (UNIT-5),** PLOT NO: 750,746, GIDC JHAGADIA, DIST.BHARUCH & intimate to us accordingly.

2. **The Chief Officer**
   Office of the Notified Area Authority
   Plot No.40,
   GIDC Jhagadia,
   Dist: Bharuch .....
   I am directed to request you to disconnect supply of **WATER** with **immediate effect** from the date of issue of this order to the industrial plant of **M/s. UPL LTD. (UNIT-5),** PLOT NO: 750,746, GIDC JHAGADIA, DIST.BHARUCH & intimate to us accordingly.

3. **Regional Officer**
   Gujarat pollution Control Board,
   Regional Office,
   Ankleshwar..... to follow up for compliance of this direction & send IR/AR.

For and on behalf of
Gujarat Pollution Control Board

(M.P.Solanki)
Dy. ENVIRONMENT ENGINEER

GPCB

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar**-382 010
Phone : (079) 23226295
Fax : (079) 23232156
Website : www.gpcb.gov.in

13. Pay Rs. 1 Cr. (One crore) as interim Environment Damage Compensation by RTGS immediately in Following A/C.

A	Name Of Payee	GUJARAT POLLUTION CONTROL BOARD
B	Bank Account Number	10325062238
C	Type of Account	CURRENT
D	Bank	STATE BANK OF INDIA
E	Branch	GANDHINAGAR ZONAL BRANCH
F	Branch Address	SECTOR-10/B, IN FRONT OF NEW SACHIVALAYA, GANDHINAGAR-382010
G	IFSC Code	SBIN0001355

IF the above direction is not complied, you are liable for prosecution under Section 37 of the Air (Prevention and Control of Pollution) Act-1981 which provides punishment with imprisonment for a term not less than one year and six months and may extend to six years and with fine.

You will submit at the earliest possible a copy of the letter from the concerned authority indicating disconnection of electric power/water supply with the date, time and meter reading. It is to be noted that without receipt of this letter revocation application will not be considered.

This letter is issued with the approval of the competent authority.

For and on behalf of
Gujarat Pollution Control Board

(M.P.Solanki)
Dy. ENVIRONMENT ENGINEER

NO: GPCB/ANK/CCA-134(29)/ID-25353/ Dated: /02/2021

Issued to:
M/S. UPL LTD. (UNIT-5)
PLOT NO: 750,746,
GIDC JHAGADIA,
DIST: BHARUCH, GUJARAT.

(P.T.O.)

Annexure - 12 Detail investigation Report on cause of incident by unit

Ann - 10

UPL Limited, Unit - 5
Plot No.746 & 750, P.B. No.9
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
t: +91 2645 226013
f: +91 2645 226017

Investigation Report

DATE: **10-MAR-21**

SUBJECT:- **INCIDENT FACT FINDINGS**

On 23rd February around 01.45 am, there was an incident of fire/explosion at our multi product plant (Clethodium / Glufosinate plant), which was not in production operation since 5th February 2021 for a planned annual boiler and power plant inspection. The same can be established by the review of data on utility consumption available at site.

Since solvents and work in progress (WIP) material was at the plant, necessary manpower was deployed in shifts (as per the routine procedure).

Based on the evidence available at site and a missing reactor of the first stage (ETB) containing WIP in reactor post completion of reaction before stoppage of production operation. This mixture had a potential hazard of decomposition, generating higher energy at 102 deg C & 266 deg C. The normal operating parameters of this process is at 10 deg C and at atm pressure and stripping of Ethyl Mercoptan at 80 deg c under vacuum of 50 torr. The other flammable chemicals like triethyl amine, toluene etc. were also present in the designated storage.

Based on the preliminary investigation, we had arrived at a conclusion that the fire/explosion may have been caused due to catalytic decomposition / vapor cloud accumulation & subsequent decomposition in the (ETB) reactor WIP. The said reactor has not been located yet during the debris removal process. Such explosion in reactor is possible due to decomposition of the ETB.

An internal investigation team was formed to investigate further into the incident. The detailed progress on the investigation is as below.

As per plant layout and incident that the explosion / fire happened in the South - West section, there were total 54 equipment's installed across 4 floors in the highly impacted area.

FACTORY MANAGER
UPL LTD., UNIT-5

UPL Limited, Unit - 5
Plot No.746 & 750, P.B. No.9
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
t: +91 2645 226013
f: +91 2645 226017

The segregation across this section was done based on the following criteria:

- Equipment with no WIP before and after incident. Total 31 such equipment's – Refer Annexure - I
- Equipment with WIP but remained as such after incident. Total 10 such equipment's – Refer Annexure – II

It was evident that the explosion was not triggered in the above equipment. Based on this remaining 13 equipment's were reviewed further for the possibilities. The 8 equipment's with low damage. – Refer Annexure – III

Now we have only 5 equipment's remained for further evaluation. From them 3 were non-metallic tanks & were totally burnt. Since it was non-metallic tanks, so chances of explosion were ruled out.

Out of remaining two equipment's one of ETB reactor & second one of Ethanol stripper column. As the ethanol stripper column was containing Ethanol & water mixer so chances of explosion were also eliminated. Hence only possibility from where explosion trigger was ETB reactor.

Considering above the possibility of sabotage was also ruled out

We suspected leakage of brine (Methanol Water Solution) through coil / heat exchangers. To establish these, experiments were carried out to study this impact on the mass in reaction when react with Methanol Brine.

Additionally, based on experiments at R & D showing Methanol solution has also reactivity with ETB reaction mass and resulted into the energy liberation which can lead to increase the temperature 62 Deg C with 1 mol ETB & 38 Deg C with 0.5 mol ETB and reaches nearer to decomposition level i.e. 102 Deg C of reaction mass as per data available for DSC. (detailed calculation and experiment details are furnished for your consideration)

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UPL LTD., UNIT-5

UPL Limited, Unit - 5
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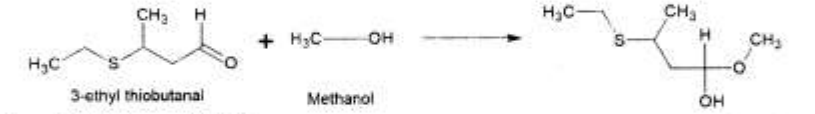
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
t: +91 2645 226013
f: +91 2645 226017

ETB + Brine Solution Chemistry & Calculation : R & D



3-ethyl thiobutanal + Methanol

Formula Weight = 132.22388

3-(ethylsulfanyl)-1-methoxybutan-1-ol (Hemiacetal)

Formula Weight = 164.26574

A) ETB + 40% MeOH enthalpy(R&D Lab data)

	quantity (gm)	moles
1) ETB (M.W-132.25) =	100	0.756
2) 40% MeOH in water =	10	0.125
3) initial temp=	33	deg C
final temp	48	deg C
4) heat capacity mix=	0.6	kcal/kg K
5) Delta T	15	deg C
6) Q =	990	Kcal (consider mass as a Kg)
	247.5	kcal/ Kg of Pure methanol
	-99	**kcal/kg of 40% Methanol (exothermic)**

B) ETB + 40% MeOH enthalpy (Plant Batch - R-25001)

	quantity (kg)	kmoles
1) ETB=	8500.0	64.272
2) 40% MeOH in water =	5141.8	64.272 **(Stoichiometry Quantity)**
3) heat capacity mix=	0.6	kcal/kg K
4) Q =	-509035.9	**kcal (exothermic)**
5) Delta T rise=	62.2	deg C

C) ETB + 40% MeOH enthalpy (Plant Batch - R-25001)

	quantity (kg)	kmoles
1) ETB=	8500.0	64.272
2) 40% MeOH in water =	2570.9	32.136 **(Half of Stoichiometry Quantity)**
3) heat capacity mix=	0.6	kcal/kg K
4) Q =	-254518.0	**kcal (exothermic)**
5) Delta T rise=	38.3	deg C

We have also shown in above sheet the potential leak with two cases based on chemistry between methanol and ETB reaction. First case showing the, 1 mol of methanol having the reaction with 1 mol of ETB mass and resulting into temperature rise of 62 deg c and second case showing the, 0.5 mol of Methanol

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UPL LTD., UNIT-5

UPL Limited, Unit - 5
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GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
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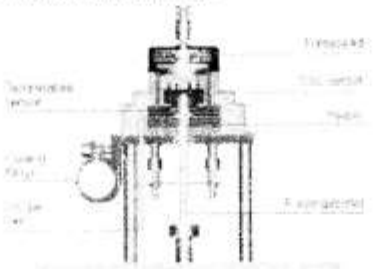
having the reaction with 0.5 mol of ETB reaction mass and resulting into the temperature rise of 38 deg c. We hereby also providing below the DSC analysis conducted for ETB mass.

PAGE 2 OF 2

1. **TEST DESCRIPTION:** *Exact quantity of sample is weighed in a Gold Plated High pressure crucible using a microbalance & the crucible is sealed under atmospheric condition. This sample is heated in the DSC cell from* ***30 °C to 400 °C at the rate of 4 °C per minute****. The results are based on interpretation of the different signals/ peaks of the thermogram.*

2. **SCHEMATIC DIAGRAM OF DSC CELL (FURNACE):**



3. **SAMPLE PREPARATION:** *As such sample*

4. **RESULT:**

	Onset	*Peak*	*Enthalpy*
1st Exotherm	*102 °C*	*191 °C*	*60 J/g*
2nd Exotherm	*266 °C*	*301 °C*	*276 J/g*

5. **INTERPRETATION & DISCUSSION:**

*The thermogram shows first exothermic decomposition onset at 102 °C with heat evolution of 60 J/g of sample (***Severity: Low***) and second exothermic decomposition onset at 266 °C with heat evolution of 276 J/g of sample (***Severity: Medium***).*

Analyst

FACTORY MANAGER
UPL LTD., UNIT-5

UPL Limited, Unit - 5
Plot No.746 & 750, P.B. No.9
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
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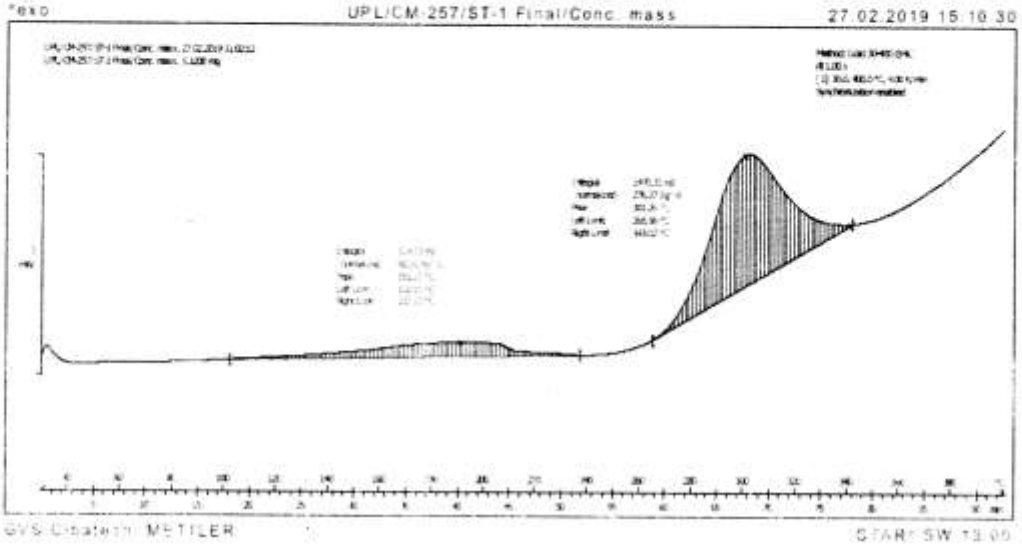


The fire and explosion got extended to other areas including to work-in-progress material having Toluene (Solvent) resulting in the unfortunate event. The fire projectiles from the primary explosion dropped to the nearby facilities including utility block and warehouse resulting in the secondary fire. The impact of explosion resulted in damage to the surrounding buildings within the site.

We are saddened by this unfortunate incident. We would want to reiterate that we follow a very stringent safety protocol and that there has been no lapse in safety precaution from our side.

For UPL Limited

Anil Mundada
Authorized Signatory

Encl: Total WIP Equipment list (Damage Area), ETB Mass (DSC Report), Elevation drawing (Damage equipment area)

FACTORY MANAGER
UPL LTD., UNIT-5

Annexure - I

"Before & After Zero WIP" Equipment List : Total 31 nos. Equipment

SR. NO.	EQUIPMENT TAG NO.	DESCRIPTION	Location in Plant	Chemical Stored	Operating condition	QTY(kg) before incident	Qty after incident	Equipment Status After incident
1	R-25024	Agitated Vessel for Residue	1F (NS)	Toluene residue	atm; 40 deg C	0	0	Status not known
2	T-25063	ETHANOL COLLECTION TANK	1F (NS)	Ethanol + Water	atm; RT	0	0	Status not known
3	R-25008	NaCl SALT PREPARAION REACTOR	1F (SS)	20 % NaCl	atm; RT	0	0	Available
4	C-25001	STAGE 1 Extraction Column for step-4	1F to 3F	Step 4A Mass + PW	atm; RT	0	0	Not tracable
5	R-25017	STEP 10A PREARATION REACTOR	3F (NS)	STEP 10 Mass	atm; 25 deg C	0	0	Status not known
6	R-25003A/B	STEP-2B REACTION REACTOR	2F (SS)	STEP 2B Mass	atm/vac; 20-50 deg C	0	0	Status not known
7	R-25007A/B	STEP 3B PREPARATION REACTOR	2F (SS)	STEP 3B Mass	atm; RT	0	0	Status not known
8	C-25013	Extraction Column FOR CATALYST PURIFICATION	2F to 3F	DMAP + Toluene	atm; RT	0	0	Status not known
9	C-25003	Extraction column FOR STEP 9C	2F to 4F	MDC+Aqueous	atm; RT	0	0	Status not known
10	R-25013	Step 8 preparation Reactor	3F (NS)	STEP 8 Mass	atm; 35-55 deg C	0	0	Available/Found at different location
11	R-25006 A/B/C/D	STEP 3A / ADDUCT PREPARATION REACTOR	3F (SS)	STEP 3A Mass	atm; 10-30 deg C	0	0	Available at location
12	FFEV-25006	VLS FOR FFE-25006	3MF (NS)	STEP 9B Mass + MDC	vac; 40 deg C	0	0	Status not known
13	FFEV-25007	VLS FOR FFE-25007	3MF (NS)	STEP 9B Mass + MDC	vac; 40 deg C	0	0	Status not known
14	FFEV-25008	VLS FOR FFE-25008	3MF (NS)	STEP 9B Mass + MDC	vac; 40 deg C	0	0	Status not known
15	V-25022	VESSEL FOR STEP 9 COLLECTION	3MF (NS)	STEP 9	atm; 15 deg C	0	0	Status not known
16	R-25002	STEP 2A AAM SALT PREPARATION REACTOR	4F (NS)	AAM Salt	atm; 30 deg C	0	0	Available/Found at different location
17	EJV-25012A/B	EJECTOR CATCHPOT FOR EJ-25012	4F (NS)	-	Vac; RT	0	0	Status not known
18	EJV-25006	CATCHPOT FOR DVP-25003	4F (NS)	-	Vac; RT	0	0	Status not known
19	V-25035	TEA DAY TANK	4F (SS)	Tri Ethyl Amine	atm; 0-10 deg C	0	0	Available/Found at different location
20	R-25004	NA2CO3 SALT PREPARATION REACTOR	4F (SS)	2% Na2CO3 solution	atm; RT	0	0	Available/Found at different location
21	R-25005	SMO SOLUTION REACTOR	4F (SS)	Sodium Methoxide Solution (in Methanol)	atm; RT	0	0	Status not known
22	T-25025	IMPURE CATALYST HOLD TANK	GF (NS)	Impure DMAP	atm; RT	0	0	Available
23	T-25020	Ethanol water hold tank	GF INPROCESS TANK FARM (NS)	Ethanol + Water	atm; RT	0	0	Burnt
24	T-25050	Step 9B product hold tank	GF INPROCESS TANK FARM (NS)	STEP 9 + MDC	atm; RT	0	0	Burnt
25	T-25022	Extract mass hold tank FOR C-25003	GF INPROCESS TANK FARM (NS)	Aq. With Nacl	atm; RT	0	0	Available
26	T-25047	Aqueous Storage tank for R-25017	GF INPROCESS TANK FARM (NS)	STEP 10A Mass	atm; 25 deg C	0	0	Available
27	T-25044	Oragnic 2 + Organic 3 storage tank	GF INPROCESS TANK FARM (NS)	STEP 10B Mass	atm; RT	0	0	Available
28	T-25026	Aqueous Storage tank	GF INPROCESS TANK FARM (NS)	Aq. Storage	atm; RT	0	0	Available
29	T-25003	AQEOUS LAYER HOLD TANK	GF INPROCESS TANK FARM (SS)	STEP 2B Aq. Mass	atm; RT	0	0	Available
30	T-25005	ORGANIC TANK (PRODUCT)	GF INPROCESS TANK FARM (SS)	STEP 3B Mass	atm; RT	0	0	Damage tank available
31	T-25016	Aqueous TANK FOR SEPARATION	GF INPROCESS TANK FARM (SS)	STEP 3B Mass	atm; RT	0	0	Damage tank available

FACTORY MANAGER
UPL LTD., UNIT-5

Annexure – II

"No Change in WIP" Equipment List : Total 10 nos. Equipment

SR. NO.	EQUIPMENT TAG NO.	DESCRIPTION	Location in Plant	Chemical Stored	Operating condition	QTY(kg) before incident	Qty after incident	Equipment Status After Incident
1	EJV-25007	SPARED	4F (NS)	-	Vac; RT	0	0	Status not known
2	T-25023	MDC + STEP 9 tank	GF (NS)	MDC + STEP 9	atm; RT	6436	6436	Available
3	T-25024	Rec MDC Collection tank	GF (NS)	Recovered MDC	atm; RT	1021	1021	Available
4	T-25091	Organic layer Hold tank FOR R-25017	GF (NS)	STEP 10 Mass	atm; RT	592	592	Available
5	T-25077	Raffinate mass hold tank FOR C-25013	GF (NS)	Extracted DMAP mass	atm; RT	627	627	Available
6	V-25001	CTA CONDENSATE COLLECTION TANK	GF (SS)	Recovered CTA from R-25001	atm; RT	387	387	Available
7	T-25002	ETB MASS HOLD TANK	GF (SS)	ETB MASS	atm; RT	9012	9012	Available
8	T-25001	TANK FOR FFE JACKET CONDENSATE COLLECTION	GF (SS)	Steam Condensate	atm; 60 deg C	1200	1200	Available
9	T-25051	DISTILL ETHANOL COLL. TANK	ROCESS TANK FAR	Recovered Ethanol + Water	atm; RT	1500	1500	Available
10	T-25004	PRODUCT HOLD TANK	ROCESS TANK FAR	STEP 2B Mass	atm; 30-50 deg C	3972	3972	Available

FACTORY MANAGER
UPL LTD., UNIT-5

Annexure – III

"Before filled WIP & After Incident Zero Quantity" Equipment List : Total 13 nos. Equipment

SR. NO.	EQUIPMENT TAG NO.	DESCRIPTION	Location in Plant	Chemical Stored	Operating condtion	QTY(kg) before incident	Qty after incident	Equipment Status After incident	Damage
1	R-25016A/B	Step 9B Preparation reactor	1F (NS)	STEP 9B Mass	atm/vac; 20-50 deg C	14000	Yet to be checked due to approch	Available	low
2	T-25076	Extract mass hold tank FOR C-25013	1F (NS)	Extracted DMAP mass	atm; RT	2118	Yet to be checked due to approch	Available	low
3	R-25009 A/B	Step 4A preparation reactor	1F (SS)	Step 4A Mass	atm/vac; 40-90 deg C	12000	Yet to be checked due to approch	Available	low
4	C-25008	Ethanol STRIPPING Column	1F to 4F	Ethanol + Water	atm; 70-108 deg C	1500	Equipment not found	Status not known	High
5	R-25014A/B	STEP 9A PREARATION REACTOR	2F (NS)	STEP 9A MASS	atm; 50 deg C	14000	0	Available/Found at different location	Medium
6	R-25001	ETB HYDROGENATION REACTOR	3F (SS)	ETB MASS	atm/vac; 10-50 deg C	6200	Equipment not found	Status not known	High
7	V-25003	CATALYST P -9 DAY TANK	3F (SS)	methyl pyridene	atm; RT	1302	0	Burnt(PVDF)	High
8	V-25002	EM DAY TANK	4F (SS)	Ethyl Mercaptan	atm; 0-10 deg C	1000	0	Available/Found at different location	low
9	T-25010	Rec Toluene Collection Tank	GF (SS)	Recovered Tolune	atm; RT	9000	0	Damage tank available	Low
10	T-25045	Product Collection Tank OF C-25001	GF (SS)	Extracted STEP 4A Mass	atm; RT	712	0	Burnt(PVDF)	High
11	T-25013	Water Wash Hold Tank FOR C-25001	GF (SS)	Extracted STEP 4A Mass	atm; RT	1219	0	Damage tank available	low
12	T-25007	ORGANIC TANK (TOULENE)	GF INPROCESS TANK FARM (SS)	STEP 3B Mass	atm; RT	27000	0	Damage tank available	Medium
13	T-25011	Reaction Mass Hold Tank	GF INPROCESS TANK FARM (SS)	STEP 4A Mass	atm; RT	3666	0	Burnt(PVDF)	High

FACTORY MANAGER
UPL LTD., UNIT-5

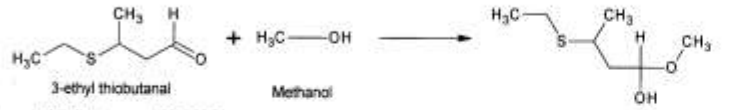
Total WIP (DAmage Area)

Damage Area WIP Equipment List : Total 54 nos. Equipment

SR. NO.	EQUIPMENT TAG NO.	DESCRIPTION	Location in Plant	Chemical Stored	Operating condition	QTY(kg) before incident	Qty after incident	Equipment Status After Incident
1	R-25004A/B	Step 9B Preparation reactor	1F (NS)	STEP 9B Mass	atm/vac; 20-50 deg C	14000	to approach	Available
2	T-25076	Extract mass hold tank FOR C-25013	1F (NS)	Extracted DMAP mass	atm; RT	2118	Yet to be checked due to approach	Available
3	R-25024	Agitated Vessel for Residue	1F (NS)	Toluene residue	atm; 40 deg C	0	0	Status not known
4	T-25063	ETHANOL COLLECTION TANK	2F (NS)	Ethanol + Water	atm; RT	0	0	Status not known
5	R-25008	NaCl SALT PREPARAION REACTOR	1F (SS)	20 % NaCl	atm; RT	0	0	Available
6	R-25009 A/B	Step 4A preparation reactor	1F (SS)	Step 4A Mass	atm/vac; 40-90 deg C	12000	to approach	Available
7	C-25003	STAGE 1 Extraction Column for step 4	1F to 3F	Step 4A Mass + PW	atm; RT	0	0	Status not known
8	C-25008	Ethanol STRIPPING Column	1F to 4F	Ethanol + Water	atm; 70-108 deg C	1500	Equipment not found	Status not known
9	R-25004A/B	STEP 9A PRCARATION REACTOR	2F (NS)	STEP 9A MASS	atm; 50 deg C	14000	0	Available/Found at different location
10	R-25017	STEP 10A PREARATION REACTOR	2F (NS)	STEP 10 Mass	atm; 25 deg C	0	0	Status not known
11	R-25003A/B	STEP 2B REACTION REACTOR	2F (SS)	STEP 2B Mass	atm/vac; 20-50 deg C	0	0	Status not known
12	R-25007A/B	STEP 3B PREPARATION REACTOR	2F (SS)	STEP 3B Mass	atm; RT	0	0	Status not known
13	C-25013	Extraction Column FOR CATALYST PURIFICATION	2F to 3F	DMAP + Toluene	atm; RT	0	0	Status not known
14	C-25003	Extraction column FOR STEP 9C	2F to 4F	MDC+Aqueous	atm; RT	0	0	Status not known
15	R-25015	Step 8 preparation Reactor	3F (NS)	STEP 8 Mass	atm; 35-55 deg C	0	0	Available/Found at different location
16	R-25001	ETB SYSNTHESIS REACTOR	3F (SS)	ETB MASS	atm/vac; 10-50 deg C	8500	Equipment not found	Status not known
17	V-25003	CATALYST P -9 DAY TANK	3F (SS)	methyl pyridine	atm; RT	1302	0	Burnt(PVDF)
18	R-25006 A/B/C/D	STEP 3A / ADDUCT PREPARATION REACTOR	3F (SS)	STEP 3A Mass	atm; 10-30 deg C	0	0	Available at location
19	FFEV-25006	VLS FOR FFE-25006	3MF (NS)	STEP 8B Mass + MDC	vac; 40 deg C	0	0	Status not known
20	FFEV-25007	VLS FOR FFE-25007	3MF (NS)	STEP 8B Mass + MDC	vac; 40 deg C	0	0	Status not known
21	FFEV-25008	VLS FOR FFE-25008	3MF (NS)	STEP 8B Mass + MDC	vac; 40 deg C	0	0	Status not known
22	V-25022	VESSEL FOR STEP 9 COLLECTION	3MF (NS)	STEP 9	atm; 15 deg C	0	0	Status not known
23	R-25002	STEP 2A AAM SALT PREPARATION REACTOR	4F (NS)	AAM Salt	atm; 30 deg C	0	0	Available/Found at different location
24	EJV-25012A/B	EJECTOR CATCHPOT FOR EJ-25012	4F (NS)	-	Vac; RT	0	0	Status not known
25	EJV-25006	CATCHPOT FOR DVP-25003	4F (NS)	-	Vac; RT	0	0	Status not known
26	EJV-25007	SPARED	4F (NS)	-	Vac; RT	0	0	Status not known
27	V-25035	TEA DAY TANK	4F (SS)	Tri Ethyl Amine	atm; 0-10 deg C	0	0	Available/Found at different location
28	V-25002	EM DAY TANK	4F (SS)	Ethyl Mercaptan	atm; 0-10 deg C	1008	0	Available/Found at different location
29	R-25004	NA2CO3 SALT PREPARATION REACTOR	4F (SS)	2N Na2CO3 solution	atm; RT	0	0	Available/Found at different location
30	R-25005	SMO SOLUTION REACTOR	4F (SS)	Sodium Methoxide Solution (in Methanol)	atm; RT	0	0	Status not known
31	T-25023	MDC + STEP 9 tank	GF (NS)	MDC + STEP 9	atm; RT	6408	6408	Available
32	T-25024	Rec MDC Collection tank	GF (NS)	Recovered MDC	atm; RT	1021	1021	Available
33	T-25091	Organic layer hold tank FOR R-25017	GF (NS)	STEP 10 Mass	atm; RT	580	580	Available
34	T-25025	IMPURE CATALYST HOLD TANK	GF (NS)	Impure DMAP	atm; RT	0	0	Available
35	T-25077	Raffinate mass hold tank FOR C-25013	GF (NS)	Extracted DMAP mass	atm; RT	627	627	Available
36	V-25001	CTA CONDENSATE COLLECTION TANK	GF (SS)	Recovered CTA from R-25001	atm; RT	387	387	Available
37	T-25002	ETB MASS HOLD TANK	GF (SS)	ETB MASS	atm; RT	9012	9012	Available
38	T-25010	Rec Toluene Collection Tank	GF (SS)	Recovered Tolune	atm; RT	6000	0	Damage tank available
39	T-25045	Product Collection Tank OF C-25001	GF (SS)	Extracted STEP 4A Mass	atm; RT	772	0	Burnt(PVDF)
40	T-25013	Water Wash Hold Tank FOR C-25001	GF (SS)	Extracted STEP 4A Mass	atm; RT	7219	0	Damage tank available
41	T-25001	TANK FOR FFE JACKET CONDENSATE COLLECTION	GF (SS)	Steam Condensate	atm; 60 deg C	1200	1200	Available
42	T-25020	Ethanol water hold tank	GF INPROCESS TANK FARM (NS)	Ethanol + Water	atm; RT	0	0	Burnt
43	T-25050	Step 9B product hold tank	GF INPROCESS TANK FARM (NS)	STEP 9 + MDC	atm; RT	0	0	Burnt
44	T-25022	Extract mass hold tank FOR C-25003	GF INPROCESS TANK FARM (NS)	Aq. With Nacl	atm; RT	0	0	Available
45	T-25047	Aqueous Storage tank for R-25017	GF INPROCESS TANK FARM (NS)	STEP 10A Mass	atm; 25 deg C	0	0	Available
46	T-25044	Organic 2 + Organic 3 storage tank	GF INPROCESS TANK FARM (NS)	STEP 10B Mass	atm; RT	0	0	Available
47	T-25028	Aqueous Storage tank	GF INPROCESS TANK FARM (NS)	Aq. Storage	atm; RT	0	0	Available
48	T-25051	DISTILL ETHANOL COLL. TANK	GF INPROCESS TANK FARM (NS)	Recovered Ethanol + Water	atm; RT	1500	1500	Available
49	T-25003	AQEOUS LAYER HOLD TANK	GF INPROCESS TANK FARM (SS)	STEP 2B Aq. Mass	atm; RT	0	0	Available
50	T-25004	PRODUCT HOLD TANK	GF INPROCESS TANK FARM (SS)	STEP 2B Mass	atm; 30-50 deg C	3972	3972	Available
51	T-25006	ORGANIC TANK (PRODUCT)	GF INPROCESS TANK FARM (SS)	STEP 3B Mass	atm; RT	0	0	Damage tank available
52	T-25007	ORGANIC TANK (TOLUENE)	GF INPROCESS TANK FARM (SS)	STEP 3B Mass	atm; RT	27000	0	Damage tank available
53	T-25016	Aqueous TANK FOR SEPARATION	GF INPROCESS TANK FARM (SS)	STEP 3B Mass	atm; RT	0	0	Damage tank available
54	T-25011	Reaction Mass Hold Tank	GF INPROCESS TANK FARM (SS)	STEP 4A Mass	atm; RT	3666	0	Burnt(PVDF)

UPL LTD., UNIT-5

ETB + Brine Solution Chemistry & Calculation : R & D



3-ethyl thiobutanal

Formula Weight = 132.22388

Methanol

3-(ethylsulfanyl)-1-methoxybutan-1-ol
(Hemiacetal)

Formula Weight = 164.26574

A) ETB + 40% MeOH enthalpy(R&D Lab data)

	quantity (gm)	moles
1) ETB (M.W-132.25) =	100	0.756
2) 40% MeOH in water =	10	0.125
3) initial temp=	33	deg C
final temp	48	deg C
4) heat capacity mix=	0.6	kcal/kg K
5) Delta T	15	deg C
6) Q =	990	Kcal (consider mass as a Kg)
	247.5	kcal/ Kg of Pure methanol
	-99	**kcal/kg of 40% Methanol (exothermic)**

B) ETB + 40% MeOH enthalpy (Plant Batch - R-25001)

	quantity (kg)	kmoles
1) ETB=	8500.0	64.272
2) 40% MeOH in water =	5141.8	64.272 **(Stoichiometry Quantity)**
3) heat capacity mix=	0.6	kcal/kg K
4) Q =	-509035.9	**kcal (exothermic)**
5) Delta T rise=	62.2	deg C

FACTORY MANAGER
UPL LTD., UNIT-5

C) ETB + 40% MeOH enthalpy (Plant Batch - R-25001)

	quantity (kg)	kmoles
1) ETB=	8500.0	64.272
2) 40% MeOH in water =	2570.9	32.136 **(Half of Stoichiometry Quantity)**
3) heat capacity mix=	0.6	kcal/kg K
4) Q =	-254518.0	**kcal (exothermic)**
5) Delta T rise=	38.3	deg C

R D, Thane (Confidential)

GVS CIBATECH
सुरक्षा. समर्पण

GVS Cibatech Pvt. Ltd.,
Firex Testing Laboratory,
A Wing, Ground Floor, LBS Marg,
Bhaichand Textile Compound,
Bhandup (West),
Mumbai – 400 078
Tel:+91-22-25961246

DSC TEST REPORT

REPORT NO.: CAL/D1631902 *Date: 27/02/2019*

PAGE NO. : 1 OF 2

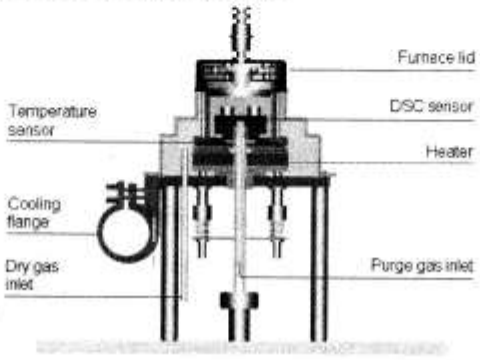
SAMPLE NAME	:	***CM-257/ST-1 Final / Conc. mass***
BATCH NO.	:	-
SAMPLE DESCRIPTION	:	*Liquid*
SAMPLE SOURCE	:	***UPL Limited,*** *R & D Center, Plot No.C-12,,* *Road No.16, Wagle Industrial Estate,* *Thane-400604.* *Mr. Krishna Patole*
DATE OF SAMPLE RECEIPT	:	*25/02/2019*
PARAMETER REQUESTED	:	*Thermal stability*
REMARK	:	*Thermogram*

Authorised Signatory
V.V.Bhujle
Senior Vice President-Technical

GVS CIBATECH
सुरक्षा, संवर्धन

1. **TEST DESCRIPTION:** *Exact quantity of sample is weighed in a Gold Plated High- pressure crucible using a microbalance & the crucible is sealed under atmospheric condition. This sample is heated in the DSC cell from* ***30°C to 400°C at the rate of 4°C per minute****. The results are based on interpretation of the different signals/ peaks of the thermogram.*

2. **SCHEMATIC DIAGRAM OF DSC CELL (FURNACE):**



3. **SAMPLE PREPARATION:** *As such sample*

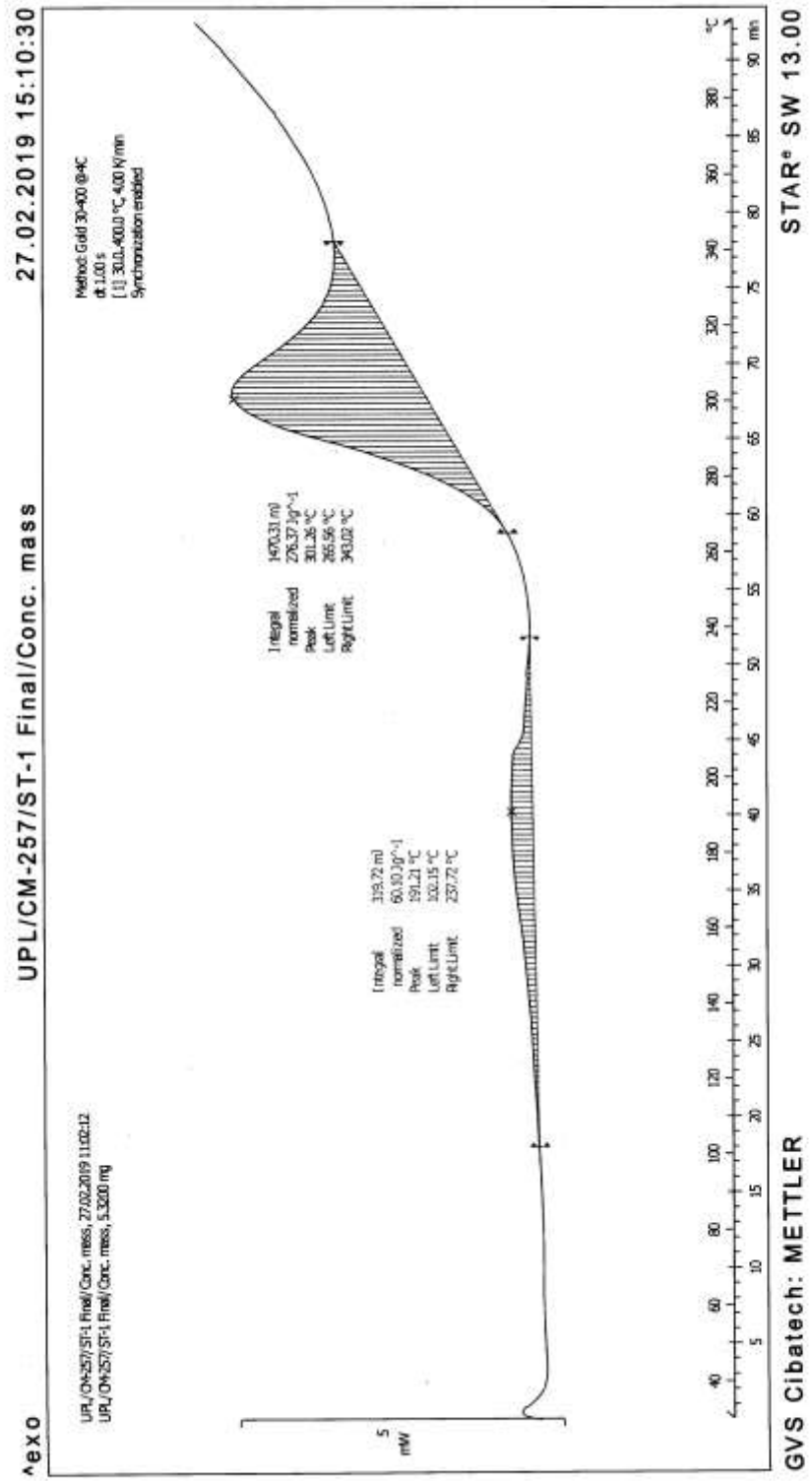
4. **RESULT:**

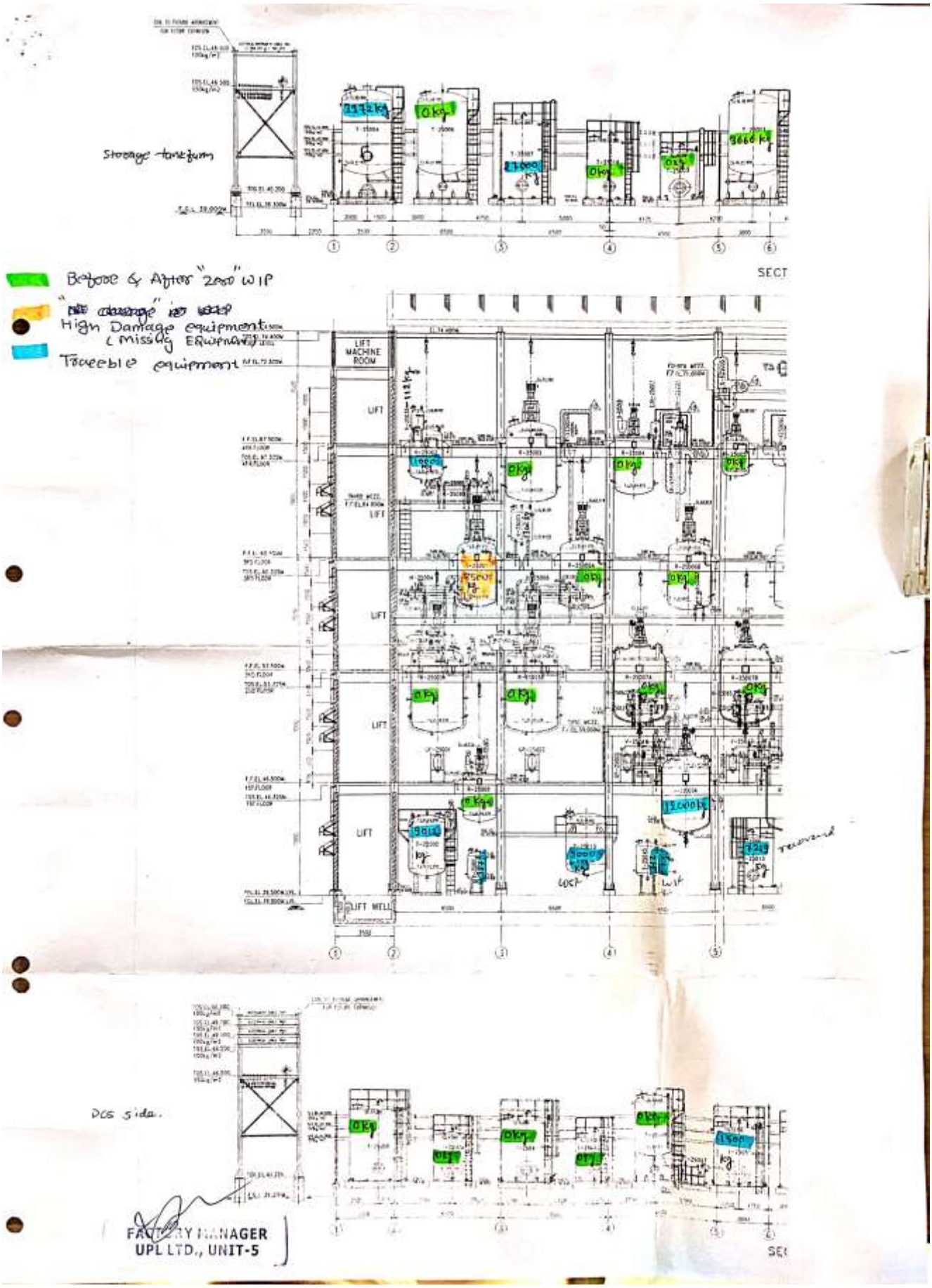
	Onset	*Peak*	*Enthalpy*
1st Exotherm	*102°C*	*191°C*	*60 J/g*
2nd Exotherm	*266°C*	*301°C*	*276 J/g*

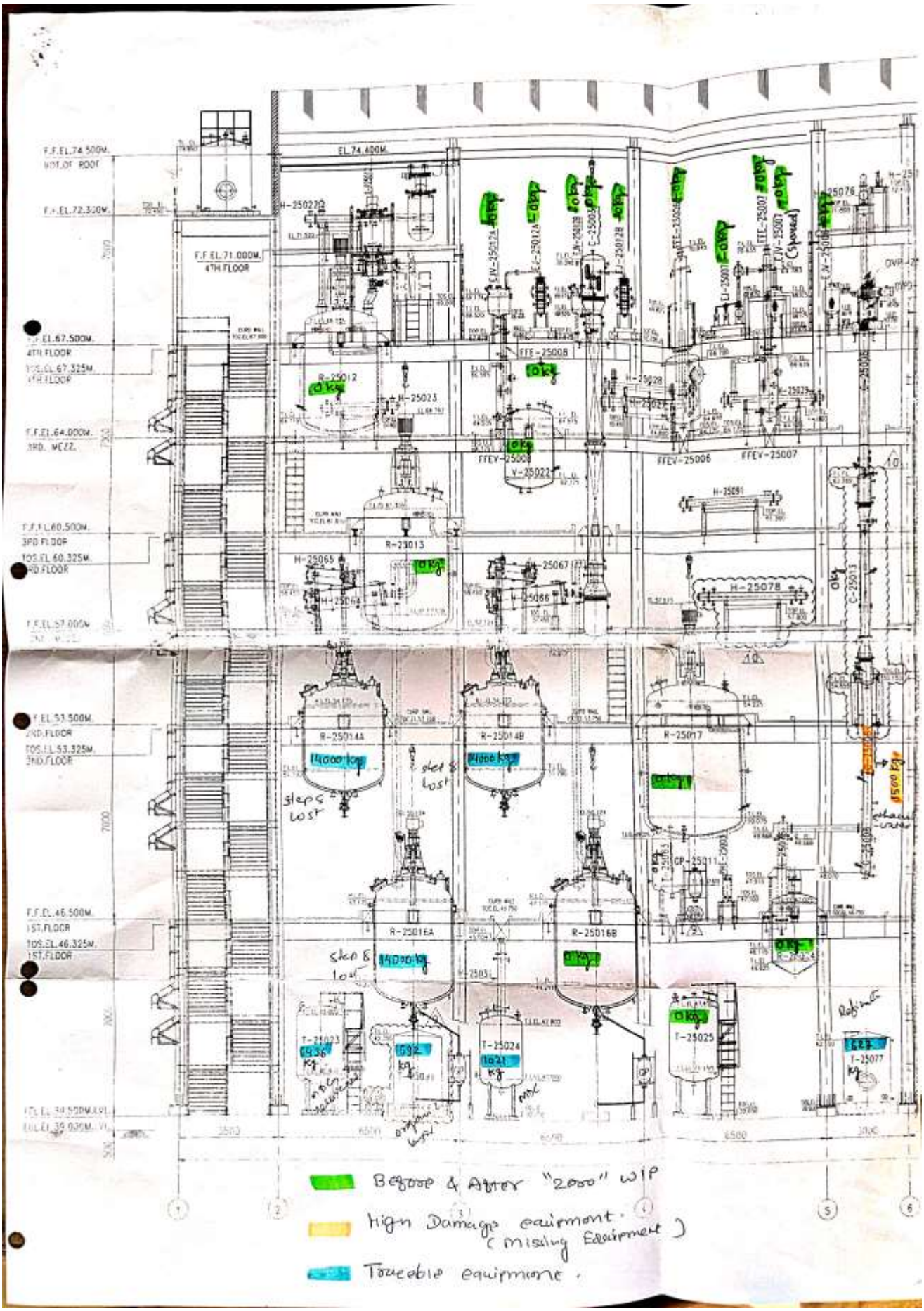
5. **INTERPRETATION & DISCUSSION:**

*The thermogram shows first exothermic decomposition onset at 102°C with heat evolution of 60 J/g of sample (****Severity: Low****) and second exothermic decomposition onset at 266°C with heat evolution of 276 J/g of sample (****Severity: Medium****).*

Analyst


^exo
UPL/CM-257/ST-1 Final/Conc. mass
27.02.2019 15:10:30
UPL/CM-257/ST-1 Final/Conc. mass, 27.02.2019 11:02:12
UPL/CM-257/ST-1 Final/Conc. mass, 5.3200 mg
Method: Gold 30-400 @4C
dt 1.00 s
[1] 30.0-400.0 °C, 4.00 K/min
Synchronization enabled
Integral 1470.31 mJ
normalized 276.37 Jg^-1
Peak 301.26 °C
Left Limit 265.56 °C
Right Limit 343.02 °C
Integral 319.72 mJ
normalized 60.10 Jg^-1
Peak 191.21 °C
Left Limit 100.15 °C
Right Limit 257.72 °C
5 mW
°C
min
STAR° SW 13.00
GVS Cibatech: METTLER


Storage tank farm
Before & After "2nd" WIP
High Damage equipment
(Missing Equipment)
Moveable equipment
LIFT MACHINE ROOM
LIFT
LIFT WELL
DCS side.
FACTORY MANAGER
UPL LTD., UNIT-5


F.F.EL.74.500M.
TOP OF ROOF
EL.74.400M.
F.F.EL.72.300M.
F.F.EL.71.000M.
4TH FLOOR
F.F.EL.67.500M.
4TH FLOOR
TOS.EL.67.325M.
4TH FLOOR
F.F.EL.64.000M.
3RD. MEZZ.
F.F.F.L.60.500M.
3RD FLOOR
TOS.EL.60.325M.
3RD FLOOR
F.F.EL.53.500M.
2ND.FLOOR
TOS.EL.53.325M.
2ND.FLOOR
F.F.EL.46.500M.
1ST.FLOOR
TOS.EL.46.325M.
1ST.FLOOR
H-25022
H-25012
H-25023
H-25013
H-25065
H-25064
H-25067
H-25066
H-25091
H-25078
R-25014A
R-25014B
R-25017
R-25016A
R-25016B
T-25023
T-25024
T-25025
T-25077
FFE-25008
FFEV-25006
FFEV-25007
V-25022
CP-25011
Steps lost
Before & After "2000" WIP
High Damage equipment. (Missing Equipment)
Traceable equipment.

06th March 2021

CM 257 DATA RETRIEVAL REPORT

With reference to service report of M/S Emerson Team on dated 26th Feb 2021, History server was fully burnt and damaged that we could not powered it up and data retrieval is not possible.

We checked with our internal IT experts also and found with such condition of hard disc, data can't be retrieved.

Document Enclosed

1. Burnt images of Hard disk, History station
2. Service Report of OEM (M/S Emerson Team)

History server

History server Hard-disk

History server (Inside view)

FACTORY MANAGER
UPL LTD., UNIT-5

EMERSON

Emerson Process Management (India) Pvt. Ltd.
Delphi B-wing 601,602, Central Avenue
Hiranadani Business Park
Powai, Mumbai-400 076
Tel:022-66620566
Fax:022-66620500

SERVICE REPORT **Date: 26/02/2021**

Customer Name: M/s UPL Ltd. Unit-5	System ID: 0015-0005-2832
Contact Person : Mr.Ajaya Singh	DeltaV R6
Address : Plot No-750/746, GIDC	CM-257 Plant
Industrial Estate, Jhgadia	
Tel/Fax No :	Email ID : ajaya.singh@upl-ltd.com

Type of Service

☐Customer Call	☐Break Down Call	☐Training
☐Start Up	☐AMC-Planned visit	☐Project
☐Commissioning	☐Preventive Maintenance	☐AMC-Emergency

M/S Emerson's engineer visited M/S UPL Ltd. (Unit-5), Jhgadia to carry out following activities dated on 26th February 2021

1) M/s Emerson physically inspected following machines:
   - Engineering Station- Physically damaged.
   - **History Station- Completely burnt**
   - 5 Operating stations- 1 no. is completely burnt out of 5, rest 4 nos. found ok.
   - 3 Remote operating stations- All seems ok.

2) M/s Emerson powered up following machines in presence of UPL Instrumentation/IT team:
   - Engineering Station- can't be possible as hardware is physically damaged.
   - **History Station- can't be possible as hardware is physically burnt.**
   - 5 Operating stations- 4 nos. were successfully powered up but any relevant information not found. 1 no. can't be powered up as completely burnt.
   - 3 Remote operating stations- 2 nos. were successfully powered up but any relevant information not found, 1 no. machine was not powered up but its hard disk is working.

3) **As per observation, physical condition of Engineering station & History station is not good to Power Up, History station was highly damaged and almost burnt with all internal components.**

4) **Emerson expert confirmed that History backup was stored only in history station as per plant system configuration and not in operator station.**

26/02/2021

26/02/2021

1

5) **Emerson team confirmed that Data recovery from such damaged/burnt hard disk is not possible.**

6) As requested by M/s UPL, M/s Emerson will check and revert regarding hardware configuration of Historian station (Dell Configuration).

Job Status ☑ Job completed Tested OK ☐ Not Completed Follow up

Action:

Remark: ☐ Chargeable ☐ AMC ☐ Warranty ☐ Project

Email Ref.: PO/OA:

Customer Acceptance:	Verification:
Signature & Date:	Signature & Date:
Customer Name: UPL Ltd. (Unit - 5) Mr. Ajaya Singh Mr. Shrikrishna Chaudhary Mr. Nilesh Barot Mr. Vaibhav Pachori Mr. Dulabhai Kavad	Emerson Process Management Engineer Name: Mr. Jitendra Patil Mr. Prayagraj Vegda

Remarks If any:

Annexure - 13: Metrological data on 23/02/2021obtained by M/s. DCM SHRIRAM LTD

No.	Date & Time	Outdoor temperature	Wind direction	Outdoor humidity	Average speed	Gust speed	Dew point	Wind chill	Absolute Pressure	Relative pressure	Daily rainfall
1	23-02-2021 0.01	26	289	47	4	4	13.8	26	1010	1013.7	0
2	23-02-2021 0.06	25.9	343	48	1.8	4	14.1	25.9	1009.7	1013.4	0
3	23-02-2021 0.11	25.8	326	49	1.8	4	14.3	25.8	1009.5	1013.2	0
4	23-02-2021 0.16	25.6	311	49	5.4	7.9	14.1	25.6	1009.6	1013.3	0
5	23-02-2021 0.21	25.5	292	47	4	7.9	13.4	25.5	1009.8	1013.5	0
6	23-02-2021 0.26	25.5	350	47	2.2	4	13.4	25.5	1009.6	1013.3	0
7	23-02-2021 0.31	25.4	311	47	6.8	7.9	13.3	25.4	1009.4	1013.1	0
8	23-02-2021 0.36	25.4	326	47	7.2	11.9	13.3	25.4	1009.3	1013	0
9	23-02-2021 0.41	25.3	267	49	2.2	4	13.9	25.3	1009.3	1013	0
10	23-02-2021 0.46	25.2	12	49	1.8	4	13.8	25.2	1009.2	1012.9	0
11	23-02-2021 0.51	25	186	49	0.7	4	13.6	25	1009.3	1013	0
12	23-02-2021 0.56	24.8	73	51	0	0	14	24.8	1009.1	1012.8	0
13	23-02-2021 1.01	24.4	70	52	0	0	13.9	24.4	1008.9	1012.6	0
14	23-02-2021 1.06	24.1	60	53	0	0	14	24.1	1009.2	1012.9	0
15	23-02-2021 1.11	23.8	74	53	0	0	13.7	23.8	1008.8	1012.5	0
16	23-02-2021 1.16	23.5	69	53	0	0	13.4	23.5	1009	1012.7	0
17	23-02-2021 1.21	23.4	50	52	0.7	4	13	23.4	1009	1012.7	0
18	23-02-2021 1.26	23.2	59	53	0	0	13.1	23.2	1008.8	1012.5	0
19	23-02-2021 1.31	23.1	31	53	0	0	13	23.1	1008.6	1012.3	0
20	23-02-2021 1.36	23.1	67	52	0	0	12.7	23.1	1008.7	1012.4	0
21	23-02-2021 1.41	23.1	35	51	0	0	12.4	23.1	1008.8	1012.5	0
22	23-02-2021 1.46	23.2	118	51	2.2	7.9	12.5	23.2	1008.7	1012.4	0
23	23-02-2021 1.51	23.2	39	52	0	0	12.8	23.2	1008.4	1012.1	0
24	23-02-2021 1.56	23.3	55	52	0.4	4	12.9	23.3	1008.6	1012.3	0
25	23-02-2021 2.01	23.3	44	51	0.4	4	12.6	23.3	1008.4	1012.1	0
26	23-02-2021 2.06	23.5	304	49	4.7	7.9	12.2	23.5	1008.3	1012	0
27	23-02-2021 2.11	23.7	274	47	8.3	11.9	11.8	23.7	1008.4	1012.1	0
28	23-02-2021 2.16	23.9	276	48	6.5	7.9	12.3	23.9	1008.2	1011.9	0
29	23-02-2021 2.21	24.2	271	49	4.7	7.9	12.8	24.2	1008.5	1012.2	0
30	23-02-2021 2.26	24.5	279	47	6.5	7.9	12.5	24.5	1008.3	1012	0
31	23-02-2021 2.31	24.8	284	47	5.4	7.9	12.8	24.8	1008.5	1012.2	0
32	23-02-2021 2.36	25	275	47	12.2	15.8	12.9	25	1008.2	1011.9	0
33	23-02-2021 2.41	25.1	242	46	4	7.9	12.7	25.1	1008.4	1012.1	0
34	23-02-2021 2.46	25.2	266	47	5.4	7.9	13.1	25.2	1008.3	1012	0
35	23-02-2021 2.51	25.2	263	47	6.5	7.9	13.1	25.2	1008.1	1011.8	0
36	23-02-2021 2.56	25.1	271	48	4	7.9	13.4	25.1	1008	1011.7	0
37	23-02-2021 3.01	25	270	48	5.4	7.9	13.3	25	1007.9	1011.6	0
38	23-02-2021 3.06	24.9	275	49	9	11.9	13.5	24.9	1007.8	1011.5	0
39	23-02-2021 3.11	24.8	264	48	4.3	7.9	13.1	24.8	1007.7	1011.4	0
40	23-02-2021 3.16	24.7	239	49	0	0	13.3	24.7	1007.8	1011.5	0
41	23-02-2021 3.21	24.6	259	48	6.8	7.9	12.9	24.6	1007.8	1011.5	0
42	23-02-2021 3.26	24.6	267	49	5.8	7.9	13.2	24.6	1007.7	1011.4	0
43	23-02-2021 3.31	24.5	22	50	0	0	13.4	24.5	1007.7	1011.4	0
44	23-02-2021 3.36	24.4	304	50	0.7	4	13.3	24.4	1007.5	1011.2	0
45	23-02-2021 3.41	24.3	333	52	0	0	13.8	24.3	1007.6	1011.3	0
46	23-02-2021 3.46	24.1	29	52	0	0	13.7	24.1	1007.8	1011.5	0
47	23-02-2021 3.51	24	8	52	0	0	13.6	24	1007.5	1011.2	0
48	23-02-2021 3.56	23.7	9	53	0.4	4	13.6	23.7	1007.4	1011.1	0
49	23-02-2021 4.01	23.5	309	52	5.4	7.9	13.1	23.5	1007.4	1011.1	0
50	23-02-2021 4.06	23.4	338	51	5.4	7.9	12.7	23.4	1007.6	1011.3	0
51	23-02-2021 4.11	23.3	44	52	0	0	12.9	23.3	1007.8	1011.5	0
52	23-02-2021 4.16	23.2	273	53	4.7	7.9	13.1	23.2	1007.8	1011.5	0
53	23-02-2021 4.21	23.1	308	51	1.4	4	12.4	23.1	1007.9	1011.6	0
54	23-02-2021 4.26	23.2	281	49	4.3	7.9	11.9	23.2	1007.8	1011.5	0
55	23-02-2021 4.31	23.3	10	47	0	0	11.4	23.3	1007.5	1011.2	0
56	23-02-2021 4.36	23.4	276	50	2.9	4	12.4	23.4	1007.5	1011.2	0
57	23-02-2021 4.41	23.4	278	52	4	4	13	23.4	1007.9	1011.6	0
58	23-02-2021 4.46	23.4	264	52	1.8	4	13	23.4	1007.6	1011.3	0
59	23-02-2021 4.51	23.5	276	50	4	4	12.5	23.5	1007.5	1011.2	0
60	23-02-2021 4.56	23.5	312	50	0.7	4	12.5	23.5	1007.7	1011.4	0
61	23-02-2021 5.01	23.4	326	52	2.2	4	13	23.4	1007.9	1011.6	0
62	23-02-2021 5.06	23.3	338	54	0.7	4	13.5	23.3	1007.9	1011.6	0
63	23-02-2021 5.11	23.1	299	53	2.9	4	13	23.1	1008	1011.7	0
64	23-02-2021 5.16	23.1	290	51	5.4	7.9	12.4	23.1	1007.7	1011.4	0
65	23-02-2021 5.21	23	259	54	2.2	4	13.2	23	1007.9	1011.6	0
66	23-02-2021 5.26	22.8	276	56	2.2	4	13.6	22.8	1008	1011.7	0
67	23-02-2021 5.31	22.6	314	56	2.9	4	13.4	22.6	1008	1011.7	0
68	23-02-2021 5.36	22.4	281	56	5.4	7.9	13.2	22.4	1007.8	1011.5	0
69	23-02-2021 5.41	22.3	291	56	2.9	4	13.1	22.3	1008.1	1011.8	0
70	23-02-2021 5.46	22.2	276	56	3.2	4	13	22.2	1008.1	1011.8	0
71	23-02-2021 5.51	22.1	284	56	5.8	7.9	12.9	22.1	1008.1	1011.8	0
72	23-02-2021 5.56	22.1	337	58	0	0	13.5	22.1	1008.4	1012.1	0

No.	Date & Time	Outdoor temperature	Wind direction	Outdoor humidity	Average speed	Gust speed	Dew point	Wind chill	Absolute Pressure	Relative pressure	Daily rainfall
73	23-02-2021 6.01	21.9	285	59	1.8	4	13.6	21.9	1008.1	1011.8	0
74	23-02-2021 6.06	21.9	289	58	4.3	7.9	13.3	21.9	1008.5	1012.2	0
75	23-02-2021 6.11	21.8	305	57	1.8	4	12.9	21.8	1008.2	1011.9	0
76	23-02-2021 6.16	21.7	314	59	0.4	4	13.4	21.7	1008.4	1012.1	0
77	23-02-2021 6.21	21.6	308	59	2.2	4	13.3	21.6	1008.6	1012.3	0
78	23-02-2021 6.26	21.5	316	60	0.4	4	13.4	21.5	1008.7	1012.4	0
79	23-02-2021 6.31	21.5	26	60	0	0	13.4	21.5	1008.7	1012.4	0
80	23-02-2021 6.36	21.4	345	60	0.4	4	13.3	21.4	1008.7	1012.4	0
81	23-02-2021 6.41	21.3	35	60	0	0	13.2	21.3	1008.6	1012.3	0
82	23-02-2021 6.46	21.1	12	62	0	0	13.6	21.1	1008.9	1012.6	0
83	23-02-2021 6.51	20.9	12	62	0	0	13.4	20.9	1009	1012.7	0
84	23-02-2021 6.56	20.6	17	63	0	0	13.3	20.6	1009	1012.7	0
85	23-02-2021 7.01	20.5	312	62	0	0	13	20.5	1009	1012.7	0
86	23-02-2021 7.06	20.4	26	60	0.4	4	12.4	20.4	1009.1	1012.8	0
87	23-02-2021 7.11	20.3	52	60	0	0	12.3	20.3	1009	1012.7	0
88	23-02-2021 7.16	20.2	45	61	0	0	12.5	20.2	1009.1	1012.8	0
89	23-02-2021 7.21	20.2	41	62	0	0	12.7	20.2	1009.3	1013	0
90	23-02-2021 7.26	20.2	43	60	0	0	12.2	20.2	1009.3	1013	0
91	23-02-2021 7.31	20.2	43	60	1.8	4	12.2	20.2	1009.2	1012.9	0
92	23-02-2021 7.36	20.2	42	59	0	0	12	20.2	1009.4	1013.1	0
93	23-02-2021 7.41	20.2	52	56	0.4	4	11.2	20.2	1009.4	1013.1	0
94	23-02-2021 7.46	20.2	47	56	0.7	4	11.2	20.2	1009.5	1013.2	0
95	23-02-2021 7.51	20.3	75	58	0	0	11.8	20.3	1009.6	1013.3	0
96	23-02-2021 7.56	20.5	73	57	0	0	11.7	20.5	1009.8	1013.5	0
97	23-02-2021 8.01	20.6	43	58	0	0	12.1	20.6	1009.8	1013.5	0
98	23-02-2021 8.06	20.8	51	56	0	0	11.7	20.8	1009.9	1013.6	0
99	23-02-2021 8.11	21	43	54	1.4	4	11.4	21	1009.8	1013.5	0
100	23-02-2021 8.16	21.2	50	52	0.7	4	11	21.2	1010.3	1014	0
101	23-02-2021 8.21	21.5	51	52	0	0	11.3	21.5	1010.2	1013.9	0
102	23-02-2021 8.26	21.9	52	52	0.4	4	11.6	21.9	1010.1	1013.8	0
103	23-02-2021 8.31	22.4	61	52	0	0	12.1	22.4	1010.3	1014	0
104	23-02-2021 8.36	22.9	76	49	0	0	11.6	22.9	1010.4	1014.1	0
105	23-02-2021 8.41	23.4	358	47	0	0	11.5	23.4	1010.4	1014.1	0
106	23-02-2021 8.46	24	35	47	0	0	12	24	1010.5	1014.2	0
107	23-02-2021 8.51	24.6	55	43	0	0	11.2	24.6	1010.4	1014.1	0
108	23-02-2021 8.56	25.3	46	42	0	0	11.5	25.3	1010.8	1014.5	0
109	23-02-2021 9.01	26	11	41	0	0	11.8	26	1010.8	1014.5	0
110	23-02-2021 9.06	26.6	10	42	0	0	12.7	26.6	1010.8	1014.5	0
111	23-02-2021 9.11	27.1	30	40	0.7	4	12.4	27.1	1010.8	1014.5	0
112	23-02-2021 9.16	27.4	54	40	0.4	4	12.6	27.4	1011	1014.7	0
113	23-02-2021 9.21	27.7	354	39	0.7	4	12.5	27.7	1011.2	1014.9	0
114	23-02-2021 9.26	27.9	316	40	0	0	13.1	27.9	1011.2	1014.9	0
115	23-02-2021 9.31	28	318	41	2.9	4	13.6	28	1011.2	1014.9	0
116	23-02-2021 9.36	28.2	278	42	1.4	4	14.1	28.2	1011	1014.7	0
117	23-02-2021 9.41	28.5	265	39	4.7	7.9	13.2	28.5	1011.4	1015.1	0
118	23-02-2021 9.46	28.8	325	40	0	0	13.9	28.8	1011.3	1015	0
119	23-02-2021 9.51	29	348	39	2.2	4	13.7	29	1011.4	1015.1	0
120	23-02-2021 9.56	29.3	286	39	1.4	4	13.9	29.3	1011.5	1015.2	0
121	23-02-2021 10.01	29.6	313	38	6.5	7.9	13.8	29.6	1011.4	1015.1	0
122	23-02-2021 10.06	29.7	307	38	4	7.9	13.9	29.7	1011.3	1015	0
123	23-02-2021 10.11	30	232	36	0.4	4	13.3	30	1011.6	1015.3	0
124	23-02-2021 10.16	30.4	264	30	13	15.8	10.9	30.4	1011.4	1015.1	0
125	23-02-2021 10.21	30.7	314	30	7.2	7.9	11.2	30.7	1011.4	1015.1	0
126	23-02-2021 10.26	31.1	232	30	1.4	4	11.5	31.1	1011.4	1015.1	0
127	23-02-2021 10.31	31.4	313	29	2.2	4	11.3	31.4	1011.6	1015.3	0
128	23-02-2021 10.36	31.8	334	30	1.4	4	12.1	31.8	1011.5	1015.2	0
129	23-02-2021 10.41	32.1	341	27	2.2	4	10.8	32.1	1011.6	1015.3	0
130	23-02-2021 10.46	32.3	280	30	9.4	11.9	12.6	32.3	1011.4	1015.1	0
131	23-02-2021 10.51	32.5	284	28	15.5	19.8	11.7	32.5	1011.4	1015.1	0
132	23-02-2021 10.56	32.6	273	29	7.2	7.9	12.3	32.6	1011.2	1014.9	0
133	23-02-2021 11.01	32.7	307	30	7.2	11.9	12.9	32.7	1011.3	1015	0
134	23-02-2021 11.06	32.7	337	28	5.8	7.9	11.8	32.7	1011.2	1014.9	0
135	23-02-2021 11.11	32.7	264	29	5.4	7.9	12.4	32.7	1011.3	1015	0
136	23-02-2021 11.16	32.7	270	29	19.4	24.1	12.4	32.7	1011.1	1014.8	0
137	23-02-2021 11.21	32.7	324	32	5.8	11.9	13.9	32.7	1011.6	1015.3	0
138	23-02-2021 11.26	32.8	299	30	13.3	15.8	13	32.8	1011.2	1014.9	0
139	23-02-2021 11.31	32.8	312	31	9.4	11.9	13.5	32.8	1011.3	1015	0
140	23-02-2021 11.36	32.8	263	29	11.9	15.8	12.5	32.8	1011.2	1014.9	0
141	23-02-2021 11.41	32.8	7	28	1.4	4	11.9	32.8	1010.9	1014.6	0
142	23-02-2021 11.46	32.9	297	28	5.8	7.9	12	32.9	1010.8	1014.5	0
143	23-02-2021 11.51	33	271	28	15.8	19.8	12.1	33	1010.7	1014.4	0
144	23-02-2021 11.56	33	253	28	14.4	19.8	12.1	33	1010.5	1014.2	0
145	23-02-2021 12.01	33	338	27	12.2	15.8	11.6	33	1010.4	1014.1	0
146	23-02-2021 12.06	33.1	267	28	15.8	15.8	12.2	33.1	1010.4	1014.1	0

No.	Date & Time	Outdoor temperature	Wind direction	Outdoor humidity	Average speed	Gust speed	Dew point	Wind chill	Absolute Pressure	Relative pressure	Daily rainfall
147	23-02-2021 12.11	33.2	266	27	12.2	15.8	11.7	33.2	1010.5	1014.2	0
148	23-02-2021 12.16	33.2	314	27	2.9	7.9	11.7	33.2	1010.4	1014.1	0
149	23-02-2021 12.21	33.4	321	27	5.8	7.9	11.9	33.4	1010.2	1013.9	0
150	23-02-2021 12.26	33.6	278	26	9	11.9	11.5	33.6	1010	1013.7	0
151	23-02-2021 12.31	33.8	308	27	11.5	15.8	12.2	33.8	1009.8	1013.5	0
152	23-02-2021 12.36	34	269	27	7.2	7.9	12.4	34	1009.8	1013.5	0
153	23-02-2021 12.41	34.1	70	27	2.9	4	12.5	34.1	1009.8	1013.5	0
154	23-02-2021 12.46	34.3	332	29	4.3	7.9	13.8	34.3	1009.6	1013.3	0
155	23-02-2021 12.51	34.6	242	28	0	0	13.5	34.6	1009.5	1013.2	0
156	23-02-2021 12.56	34.8	195	29	0.4	4	14.2	34.8	1009.4	1013.1	0
157	23-02-2021 13.01	35	231	31	4	7.9	15.4	35	1009.4	1013.1	0
158	23-02-2021 13.06	35.4	277	24	14.8	19.8	11.8	35.4	1009.4	1013.1	0
159	23-02-2021 13.11	35.5	157	27	0.7	4	13.7	35.5	1009.2	1012.9	0
160	23-02-2021 13.16	35.7	354	27	1.4	4	13.8	35.7	1009.2	1012.9	0
161	23-02-2021 13.21	35.8	262	25	4	7.9	12.8	35.8	1008.9	1012.6	0
162	23-02-2021 13.26	35.8	266	27	9.4	15.8	13.9	35.8	1009.1	1012.8	0
163	23-02-2021 13.31	35.7	286	25	6.5	7.9	12.7	35.7	1008.8	1012.5	0
164	23-02-2021 13.36	35.5	117	27	0.4	4	13.7	35.5	1008.6	1012.3	0
165	23-02-2021 13.41	35.7	62	27	1.4	4	13.8	35.7	1008.7	1012.4	0
166	23-02-2021 13.46	35.7	338	28	5.4	7.9	14.4	35.7	1008.6	1012.3	0
167	23-02-2021 13.51	35.4	33	26	0.7	4	13	35.4	1008.8	1012.5	0
168	23-02-2021 13.56	35.4	215	30	0.7	4	15.2	35.4	1008.4	1012.1	0
169	23-02-2021 14.01	35.7	335	25	9	11.9	12.7	35.7	1008.3	1012	0
170	23-02-2021 14.06	35.6	285	26	6.8	11.9	13.2	35.6	1008	1011.7	0
171	23-02-2021 14.11	35.4	327	26	1.4	4	13	35.4	1007.9	1011.6	0
172	23-02-2021 14.16	35.3	285	26	0.7	4	12.9	35.3	1008	1011.7	0
173	23-02-2021 14.21	35.5	170	25	0.7	4	12.5	35.5	1008	1011.7	0
174	23-02-2021 14.26	35.6	204	25	0	0	12.6	35.6	1007.9	1011.6	0
175	23-02-2021 14.31	35.8	162	28	0	0	14.5	35.8	1007.8	1011.5	0
176	23-02-2021 14.36	36.2	230	29	0.4	4	15.4	36.2	1007.8	1011.5	0
177	23-02-2021 14.41	36.5	39	29	0	0	15.6	36.5	1007.8	1011.5	0
178	23-02-2021 14.46	36.9	217	26	2.2	4	14.3	36.9	1007.7	1011.4	0
179	23-02-2021 14.51	37.1	186	26	0.4	4	14.5	37.1	1007.5	1011.2	0
180	23-02-2021 14.56	37.2	289	27	4	7.9	15.1	37.2	1007.4	1011.1	0
181	23-02-2021 15.01	37	282	25	14.8	15.8	13.8	37	1007.4	1011.1	0
182	23-02-2021 15.06	36.6	275	28	6.8	7.9	15.2	36.6	1007.4	1011.1	0
183	23-02-2021 15.11	36.3	333	28	4.3	7.9	14.9	36.3	1007	1010.7	0
184	23-02-2021 15.16	35.8	248	27	2.2	4	13.9	35.8	1007.2	1010.9	0
185	23-02-2021 15.21	35.4	272	31	8.3	11.9	15.7	35.4	1006.9	1010.6	0
186	23-02-2021 15.26	35.1	205	30	0	0	15	35.1	1006.9	1010.6	0
187	23-02-2021 15.31	35	266	26	14.8	15.8	12.7	35	1007.1	1010.8	0
188	23-02-2021 15.36	34.9	271	27	9	11.9	13.2	34.9	1007	1010.7	0
189	23-02-2021 15.41	34.9	256	30	0.4	4	14.8	34.9	1007	1010.7	0
190	23-02-2021 15.46	34.9	264	28	6.8	11.9	13.7	34.9	1007	1010.7	0
191	23-02-2021 15.51	34.8	295	28	9.7	11.9	13.6	34.8	1007	1010.7	0
192	23-02-2021 15.56	34.8	284	28	7.9	11.9	13.6	34.8	1006.9	1010.6	0
193	23-02-2021 16.01	34.6	284	30	0	0	14.5	34.6	1006.7	1010.4	0
194	23-02-2021 16.06	34.7	286	27	7.2	11.9	13	34.7	1006.8	1010.5	0
195	23-02-2021 16.11	34.6	222	29	2.2	4	14	34.6	1006.7	1010.4	0
196	23-02-2021 16.16	34.7	261	28	6.5	7.9	13.6	34.7	1006.9	1010.6	0
197	23-02-2021 16.21	34.6	234	27	8.3	11.9	12.9	34.6	1006.5	1010.2	0
198	23-02-2021 16.26	34.7	267	28	4.3	7.9	13.6	34.7	1006.6	1010.3	0
199	23-02-2021 16.31	34.7	282	28	9.7	11.9	13.6	34.7	1006.7	1010.4	0
200	23-02-2021 16.36	34.5	241	34	1.4	4	16.4	34.5	1006.7	1010.4	0
201	23-02-2021 16.41	34.5	270	28	9	11.9	13.4	34.5	1006.7	1010.4	0
202	23-02-2021 16.46	34.4	256	28	3.2	4	13.3	34.4	1006.8	1010.5	0
203	23-02-2021 16.51	34.4	342	29	7.2	7.9	13.8	34.4	1006.6	1010.3	0
204	23-02-2021 16.56	34.2	276	29	10.4	11.9	13.7	34.2	1006.7	1010.4	0
205	23-02-2021 17.01	34	278	33	18	19.8	15.5	34	1006.5	1010.2	0
206	23-02-2021 17.06	34	245	29	12.2	15.8	13.5	34	1006.8	1010.5	0
207	23-02-2021 17.11	33.9	2	29	5.4	7.9	13.4	33.9	1006.7	1010.4	0
208	23-02-2021 17.16	33.9	267	28	11.5	11.9	12.9	33.9	1006.7	1010.4	0
209	23-02-2021 17.21	33.8	271	35	9.7	11.9	16.2	33.8	1006.5	1010.2	0
210	23-02-2021 17.26	33.7	275	29	16.9	19.8	13.2	33.7	1006.9	1010.6	0
211	23-02-2021 17.31	33.6	288	29	12.2	15.8	13.2	33.6	1007	1010.7	0
212	23-02-2021 17.36	33.6	277	34	9.7	11.9	15.6	33.6	1007.1	1010.8	0
213	23-02-2021 17.41	33.5	262	30	6.8	11.9	13.6	33.5	1006.9	1010.6	0
214	23-02-2021 17.46	33.4	245	31	0	0	14	33.4	1006.8	1010.5	0
215	23-02-2021 17.51	33.3	305	36	8.3	11.9	16.2	33.3	1006.9	1010.6	0
216	23-02-2021 17.56	33.2	290	33	7.2	11.9	14.8	33.2	1007	1010.7	0
217	23-02-2021 18.01	33.2	270	31	8.3	15.8	13.8	33.2	1006.9	1010.6	0

No.	Date & Time	Outdoor temperature	Wind direction	Outdoor humidity	Average speed	Gust speed	Dew point	Wind chill	Absolute Pressure	Relative pressure	Daily rainfall
218	23-02-2021 18.06	33	282	32	8.3	11.9	14.1	33	1007.1	1010.8	0
219	23-02-2021 18.11	32.9	280	33	9	11.9	14.5	32.9	1007.1	1010.8	0
220	23-02-2021 18.16	32.8	274	34	9.4	11.9	14.9	32.8	1007	1010.7	0
221	23-02-2021 18.21	32.6	262	33	15.5	19.8	14.3	32.6	1007.2	1010.9	0
222	23-02-2021 18.26	32.5	260	33	9	11.9	14.2	32.5	1007.2	1010.9	0
223	23-02-2021 18.31	32.3	276	33	14.4	15.8	14	32.3	1007.1	1010.8	0
224	23-02-2021 18.36	32.2	278	34	13.3	15.8	14.4	32.2	1007.1	1010.8	0
225	23-02-2021 18.41	32.1	281	34	12.2	15.8	14.3	32.1	1007.1	1010.8	0
226	23-02-2021 18.46	31.9	271	36	9.4	11.9	15	31.9	1007.3	1011	0
227	23-02-2021 18.51	31.8	277	35	11.5	15.8	14.5	31.8	1007.4	1011.1	0
228	23-02-2021 18.56	31.7	284	36	7.2	11.9	14.8	31.7	1007.1	1010.8	0
229	23-02-2021 19.01	31.6	280	36	6.5	7.9	14.7	31.6	1007.6	1011.3	0
230	23-02-2021 19.06	31.5	278	37	14.8	15.8	15.1	31.5	1007.5	1011.2	0
231	23-02-2021 19.11	31.3	270	35	15.5	15.8	14	31.3	1007.3	1011	0
232	23-02-2021 19.16	31.2	216	37	1.8	4	14.8	31.2	1007.5	1011.2	0
233	23-02-2021 19.21	31.1	254	37	3.2	4	14.7	31.1	1007.3	1011	0
234	23-02-2021 19.26	31	233	36	3.2	4	14.2	31	1007.6	1011.3	0
235	23-02-2021 19.31	30.9	130	40	0	0	15.8	30.9	1007.6	1011.3	0
236	23-02-2021 19.36	30.8	243	39	0	0	15.3	30.8	1007.7	1011.4	0
237	23-02-2021 19.41	30.6	156	39	0	0	15.1	30.6	1007.7	1011.4	0
238	23-02-2021 19.46	30.5	245	41	2.2	4	15.8	30.5	1007.6	1011.3	0
239	23-02-2021 19.51	30.3	309	39	4.3	7.9	14.8	30.3	1007.6	1011.3	0
240	23-02-2021 19.56	30.2	288	41	3.2	4	15.5	30.2	1007.5	1011.2	0
241	23-02-2021 20.01	30.1	80	38	0	0	14.3	30.1	1007.9	1011.6	0
242	23-02-2021 20.06	29.9	301	40	1.8	7.9	14.9	29.9	1008	1011.7	0
243	23-02-2021 20.11	29.8	176	39	0.4	4	14.4	29.8	1007.9	1011.6	0
244	23-02-2021 20.16	29.7	233	38	5.4	7.9	13.9	29.7	1007.9	1011.6	0
245	23-02-2021 20.21	29.6	257	39	6.8	7.9	14.2	29.6	1008.1	1011.8	0
246	23-02-2021 20.26	29.5	124	42	0	0	15.3	29.5	1007.9	1011.6	0
247	23-02-2021 20.31	29.4	227	40	0.7	4	14.4	29.4	1008.1	1011.8	0
248	23-02-2021 20.36	29.3	235	40	0	0	14.3	29.3	1008.2	1011.9	0
249	23-02-2021 20.41	29.2	284	40	4.3	7.9	14.2	29.2	1008.3	1012	0
250	23-02-2021 20.46	29	176	41	0.7	4	14.5	29	1008.1	1011.8	0
251	23-02-2021 20.51	28.9	120	40	0.4	4	14	28.9	1008.3	1012	0
252	23-02-2021 20.56	28.8	122	42	0	0	14.6	28.8	1008.3	1012	0
253	23-02-2021 21.01	28.7	270	41	5.4	11.9	14.2	28.7	1008.5	1012.2	0
254	23-02-2021 21.06	28.6	187	43	0	0	14.8	28.6	1008.6	1012.3	0
255	23-02-2021 21.11	28.5	347	42	2.2	4	14.4	28.5	1008.7	1012.4	0
256	23-02-2021 21.16	28.4	274	40	6.5	7.9	13.5	28.4	1008.5	1012.2	0
257	23-02-2021 21.21	28.3	227	41	1.4	4	13.8	28.3	1008.6	1012.3	0
258	23-02-2021 21.26	28.3	238	41	0.7	4	13.8	28.3	1008.7	1012.4	0
259	23-02-2021 21.31	28.2	237	41	2.2	7.9	13.7	28.2	1008.8	1012.5	0
260	23-02-2021 21.36	28.1	199	41	0.7	4	13.6	28.1	1008.9	1012.6	0
261	23-02-2021 21.41	28.1	256	42	9.7	11.9	14	28.1	1008.7	1012.4	0
262	23-02-2021 21.46	28	280	42	12.2	15.8	13.9	28	1008.7	1012.4	0
263	23-02-2021 21.51	27.9	278	41	12.2	15.8	13.5	27.9	1008.6	1012.3	0
264	23-02-2021 21.56	27.9	275	41	12.2	15.8	13.5	27.9	1008.7	1012.4	0
265	23-02-2021 22.01	27.8	266	41	9.4	11.9	13.4	27.8	1008.7	1012.4	0
266	23-02-2021 22.06	27.8	266	41	9.4	11.9	13.4	27.8	1008.5	1012.2	0
267	23-02-2021 22.11	27.7	298	41	4.7	11.9	13.3	27.7	1008.8	1012.5	0
268	23-02-2021 22.16	27.7	258	41	9.7	11.9	13.3	27.7	1008.9	1012.6	0
269	23-02-2021 22.21	27.7	277	41	11.5	11.9	13.3	27.7	1008.8	1012.5	0
270	23-02-2021 22.26	27.7	289	43	5.4	7.9	14	27.7	1008.7	1012.4	0
271	23-02-2021 22.31	27.7	328	43	0	0	14	27.7	1008.7	1012.4	0
272	23-02-2021 22.36	27.5	288	44	1.4	4	14.2	27.5	1008.9	1012.6	0
273	23-02-2021 22.41	27.4	310	44	0.7	4	14.1	27.4	1008.8	1012.5	0
274	23-02-2021 22.46	27.2	37	45	0	0	14.3	27.2	1008.8	1012.5	0
275	23-02-2021 22.51	27	345	44	3.2	4	13.7	27	1008.7	1012.4	0
276	23-02-2021 22.56	26.8	347	45	0.7	4	13.9	26.8	1008.7	1012.4	0
277	23-02-2021 23.01	26.6	286	45	5.4	7.9	13.7	26.6	1008.7	1012.4	0
278	23-02-2021 23.06	26.3	22	46	0	0	13.8	26.3	1008.8	1012.5	0
279	23-02-2021 23.11	26.1	29	46	0	0	13.6	26.1	1008.7	1012.4	0
280	23-02-2021 23.16	25.8	352	46	0.4	4	13.3	25.8	1008.8	1012.5	0
281	23-02-2021 23.21	25.5	38	46	0.4	4	13.1	25.5	1008.9	1012.6	0
282	23-02-2021 23.26	25.3	36	47	0.4	4	13.2	25.3	1008.5	1012.2	0
283	23-02-2021 23.31	25.1	51	47	1.4	4	13	25.1	1008.6	1012.3	0
284	23-02-2021 23.36	24.9	52	47	0	0	12.8	24.9	1008.9	1012.6	0
285	23-02-2021 23.41	24.8	44	47	2.2	4	12.8	24.8	1008.7	1012.4	0
286	23-02-2021 23.46	24.7	30	47	0.7	4	12.7	24.7	1008.7	1012.4	0
287	23-02-2021 23.51	24.6	325	46	0.4	4	12.2	24.6	1008.5	1012.2	0
288	23-02-2021 23.56	24.6	40	47	0	0	12.6	24.6	1008.5	1012.2	0
	Avg	**28.45**	219.52	**41.05**	**4.16**	**6.35**	**13.35**	**28.45**	**1008.66**	**1012.36**	**0.00**

Annexure - 14: Compensation sheet to diseased person

Compensation calculated by committee

S No.	Name	DOB	Qualification	Designation	Avg. Daily Wage Rate of Gujarat	Age at the time of Death	Salary per month(gross)	Percentage of future prospect	Monthly future prospect	Percentage of deduction towards personal expenses	Monthly income (gross monthly + future prospect)	Monthly amount towards personal expenses	No. of Months	Multiplier	Expense towards love and affection	Expense towards last rites	Compensation
							A		B=50% or 0% of A		C=A+B	D=33.33% or 50% of C	E	F	G	H	I=((A+B-DxExF)+G+H)
1	Late Ketankumar Gevariya	24-11-1991	B.Sc (Chemistry)	Field Executive Process	NA	29	28912	50	14456	33.33	43368	14454.554	12	17	200000	50000	61,48,342.90
2	Late Vanrajsinh Dodiya	10-03-1992	B.Sc (Chemistry)	Field Executive Process	NA	29	29291	50	14645.5	50	43936.5	21968.25	12	17	200000	50000	47,31,523.00
3	Late Krunal Patel	13-11-1992	B.Sc (Chemistry)	Field Executive Process	NA	28	22120	50	11060	50	33180	16590	12	17	200000	50000	36,34,360.00
4	Lt Nehal Mehta	02-09-1995	ITI (AOCP)	Field Specialist Process	NA	25	22115	50	11057.5	50	33172.5	16586.25	12	18	200000	50000	38,32,630.00
5	Late Kuvarlal Kasdekar	14-02-2002	12th Pass	Helper	324.5	19	8437	50	4218.5	50	12655.5	6327.75	12	18	200000	50000	16,16,794.00
6	Late Kamal Panse	12-07-1998	09th Pass	Helper	324.5	23	8437	50	4218.5	50	12655.5	6327.75	12	18	200000	50000	16,16,794.00
7	Late Maniram Dhikare	13-04-1999	09th Pass	Helper	324.5	22	8437	50	4218.5	50	12655.5	6327.75	12	18	200000	50000	16,16,794.00
																Total Compensation	**2,31,97,237.90**

Compensation given by Unit

UPL Limited, Unit - 5
Plot No.746 & 750, P.B. No.9
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
t: +91 2645 226013

Date: 23rd March 2021

To,
Sub Divisional Magistrate,
Jhagadia, Bharuch

Subject: Compensation for the Injured - CM 257 Accident

Dear Sir,

1. Apropos our previous communication on the subject, 53 personnel got injured in CM-257 accident, details of which is tabulated below:

Employment Category	No injury	Minor Injury	Simple Injury	Grievous Injury	Grand Total
Staff	2	16	2	3	23
3rd Party	1	1	1		3
Contract Labour	4	7	5	3	19
Job Work	1	5	1		7
Outsider		1			1
Grand Total	**8**	**30**	**9**	**6**	**53**

2. We are proposing to compensate INR 5 lacs & 2.5 lacs for "Grievous Injury" & "Simple Injury" respectively. Details of the compensation plan is as tabulated below:

Sr	Name	Type of Employment	Type of Injury	Comp	Interim ex-gratia	Final amount
1	Hardikbhai Patel	Staff	Grievous Injury	5	1	4
2	Bind Niteshkumar Darashbhai	Staff	Grievous Injury	5	1	4
3	Merja Ravi Balubhai	Staff	Grievous Injury	5		5
4	Mangal Singh	Contract Labour	Grievous Injury	5	1	4
5	Vasava Bharat bhai	Contract Labour	Grievous Injury	5	1	4
6	Kalyan Yadav	Contract Labour	Grievous Injury	5		5

UPL LIMITED, UNIT-5 JHAGADIA

Registered Office: 3-11, GIDC, Vapi 396 195, Gujarat, India. P +91 260 2432716 CIN:L24219GJ1985PLC025132

UPL Limited, Unit - 5
Plot No.746 & 750, P.B. No.9
GIDC, Dist. Bharuch
Jhagadia 393 110 Gujarat, India

w: upl-ltd.com
t: +91 2645 226013

7	Parmar Mayankkumar Mahendrabhai	3rd Party	Simple Injury	2.5		2.5
8	Hiteshkumar Rameshbhai Suryavanshi	Staff	Simple Injury	2.5		2.5
9	Patel Smitkumar	Staff	Simple Injury	2.5		2.5
10	Raushan Kumar	Contract Labour	Simple Injury	2.5		2.5
11	Balbir	Contract Labour	Simple Injury	2.5		2.5
12	Rajnish Kumar	Contract Labour	Simple Injury	2.5		2.5
13	Surendra Prasad	Contract Labour	Simple Injury	2.5		2.5
14	Tularam Yadav	Contract Labour	Simple Injury	2.5		2.5
15	Mangal Yadav	Job Work	Simple Injury	2.5		2.5
Total				52.5	4	48.5

3. This has approval of the management & we intend to complete this within 5 working days.

Sincerely,
For, UPL Limited (Unit-05),

Anil Mundada
Unit Head
Annexures:

UPL LIMITED, UNIT-5 JHAGADIA

Annexure – "A" : Certificate of Civil Surgeon on Injury Classification

Copy to:

1. Deputy Director of Industrial Safety & Health, Bharuch.
2. Regional Officer, GPCB, Ankleshwar.

Registered Office: 3-11, GIDC, Vapi 396 195, Gujarat, India. P +91 260 2432716 CIN:L24219GJ1985PLC025132

Annexure "A"

જનરલ હોસ્પિટલ, ભરૂચ

નગર સેવા સદનની બાજુમાં, ફોન નંબર:- ૦૨૬૪૨ ૨૪૧૭૫૯,

E-mail:- cdmobha@gmail.com , cdmo.health.bharuch@gmail.com

કમાંક/જહોભ/મકમ/UPL Ltd./૧૮૦૯/૨૦૨૧ તા.૨૦.૦૩.૨૦૨૧

પ્રતિ

સીનીયર એક્ષ્યુકયુટીવ (પી એન્ડ એ),
યુ-પ યુ.પી.એલ લીમીટેડ,
જઝડીયા જી.આઇ.ડી.સી,
ઝગડીયા જી-ભરૂચ

વિષય:- પ્રમાણપત્ર બાબત.

મહોદયશ્રી,

આપના તરફથી મળેલ પત્ર તા.૦૬/૦૩/૨૦૨૧ના પ્રમાણે તા-૨૩/૦૨/૨૦૨૧નાં રોજ CM-257 પ્લાન્ટમાં જે બ્લાસ્ટનો અકસ્માત બનેલ હતો આ બાબતમાં જુદી-જુદી હોસ્પિટલમાં સારવાર પામેલ દર્દીઓના ઇજાની વિગત જણાવેલ છે. તથા ૩ દર્દીઓ નામે ૧) મંગલ રાઠોડ ૨) ભરત વસાવા ૩) નિલેશ બીંડ માટે અપંગતાનું સર્ટીફીકેટની માંગણી કરેલ છે. હાલમાં મંગલ રાઠોડ અને ભરત વસાવા હીલીંગ ટચ હોસ્પિટલ ભરૂચ ખાતે ૨૦ દિવસથી વધારે સમયથી દાખલ છે અને સારવાર હેઠળ છે. આથી જયાં સુધી સારવાર પૂર્ણ ના થાય ત્યાં સુધી અપંગતા બાબતમાં કોઇપણ પ્રકારનો અભિપ્રાય આપી શકાય તેમ નથી. ત્રીજા દર્દી નિતેશ બીંડ બાબતમાં સારવાર કરનાર તબીબનું પણ અભિપ્રાય અપંગતા બાબતમાં નકારાત્મક છે અને એમને ૬ અઠવાડીયા પછી જનરલ હોસ્પિટલ ભરૂચ ખાતે હાંડકાના સર્જન પાસે પૂન:વિચાર માટે લાવવા વિનંતી.

આપના તરફથી આવેલ ૫૩ દર્દીઓ માંથી ૫૧ દર્દીઓની તપાસ કરતાં તથા સારવાર કરનાર તબીબનાં સર્ટીફીકેટ ઉપરથી અમે નીચે મુજબનો ઇજાની ગંભીરતા બાબતમાં અભિપ્રાય આપેલ છે. આ માંથી

1) GRIEVOUS HURT INJURY CASES	– 06
2) SIMPLE INJURY CASES	– 09
3) MINOR INJURY CASES	– 30
4) NO INJURY INJURY CASES	– 08
TOTAL CASES	- 53

મુખ્ય જિલ્લા તબીબી અધિકારી
સહ સિવિલ સર્જન
જનરલ હોસ્પિટલ, ભરૂચ

નકલ સવિનય રવાના
૧) કલેકટરશ્રી, કલેકટરશ્રીની કચેરી, ભરૂચ
૨) એસ.ડી.એમશ્રી ભરૂચ, ઝગડીયા
૩) નિવાસી તબીબી અધિકારીશ્રી. જ.હો.ભરૂચ

COVID-19 Letter

GENERAL HOSPITAL BHARUCH

Chief District Medical officer Cum Civil Surgeon, General Hospital Bharuch.
Nr. Nagar Seva Sadan, Phone/Fax No. 02642 241759,Email:cdmo.health.bharuch@gmail.com

Hospitals Line listing of Of Patients of UPL LIMITED, UNIT-5 JHAGADIA,TA-JHAGADIA, DIST : BHARUCH

Sr No.	Patient Name	Age (Yrs)	Sex	OPD/IPD	DATE OF ADMISSION	DATE OF DISCHARGE	TOTAL DAYS OF ADMISSION	TYPE OF INJURY SIMPLE/GRIEVOUS
JAYABEN MODY HOSPITAL, ANKLESHWAR								
1	KALYAN YADAV	20	MALE	OPD	2/25/2021	2/25/2021	--	GRIEVOUS
2	SMIT PATEL	24	MALE	OPD	2/23/2021	2/23/2021	--	SIMPLE
3	MAYANK PARMAR	24	MALE	OPD	2/23/2021	2/23/2021	--	SIMPLE
4	TULARAM YADAV	20	MALE	OPD	2/23/2021	2/23/2021	--	SIMPLE
5	RAVI MERIJA	24	MALE	OPD	2/23/2021	2/23/2021	--	GRIEVOUS
6	NITESH BIND	29	MALE	IPD	2/23/2021	2/26/2021	4 days	GRIEVOUS
7	HARDIK PATEL	28	MALE	IPD	2/23/2021	3/1/2021	7 days	GRIEVOUS
8	HITESH SURYA VANSHI	25	MALE	OPD	2/23/2021	2/23/2021	--	SIMPLE
9	BALVIR PARIHAR	20	MALE	IPD	2/23/2021	2/24/2021	2 days	SIMPLE
10	MANGAL YADAV	22	MALE	IPD	2/23/2021	3/5/2021	11 days	SIMPLE
11	NILESH YADAV	19	MALE	OPD	2/25/2021	2/25/2021	--	MINOR
12	SHAILENDRA YADAV	22	MALE	OPD	2/25/2021	2/25/2021	--	MINOR
13	HARDIK JAMALIYA	26	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
14	NAGMANISINGH	50	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
15	DIPAK THAKOR	22	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
16	RAJNESH GUPTA	24	MALE	OPD	2/23/2021	2/23/2021	--	SIMPLE
17	TEJAS BORSE	22	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
18	SURENDRA PRASAD	24	MALE	OPD	2/23/2021	2/23/2021	--	SIMPLE
19	KRUNAL SURTI	22	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
20	PRADIP SINGH	24	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
21	NITESH PATEL	26	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
22	GITANSHU PATEL	26	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
23	VINOD BANSKAR	20	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
24	ROSHANKUMAR SHAH	20	MALE	IPD	2/23/2021	2/24/2021	2 days	SIMPLE
25	KAILASH PATI	22	MALE	IPD	2/23/2021	2/24/2021	2 days	MINOR
26	RONAK P. SUTHAR	26	MALE	OPD	2/24/2021	2/24/2021	--	NO INJURY
27	MANJEETSINGH	23	MALE	OPD	2/26/2021	2/26/2021	--	NO INJURY
28	SANDIP SONAR	26	MALE	OPD	2/25/2021	2/25/2021	--	NO INJURY
29	CHANDAN MISHRA	29	MALE	OPD	2/23/2021	2/23/2021	--	NO INJURY
30	ASHOK SHATRUGAN	22	MALE	OPD	2/23/2021	2/23/2021	--	NO INJURY

HEALING TOUCH HOSPITAL, FALSHRUTI NAGAR, BHARUCH

31	MANGAL RATHOD	20	MALE	IPD	2/23/2021	NOT DISCHARGED	IPD>20 Days	GRIEVOUS
32	BHARAT KARANSINGH	25	MALE	IPD	2/23/2021	NOT DISCHARGED	IPD>20 Days	GRIEVOUS
33	NILESH DUDHATRA	30	MALE	OPD	2/23/2021	2/23/2021	--	MINOR

UPL-LIMITED, UNIT- 5 OCCUPATIONAL HEALTH CENTRE, JHAGADIA

34	INDRAPAL JOHARSINGH YADAV	25	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
35	SANTOSH GANGA MANDAL	22	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
36	SANGAMKUMAR THAKOR	23	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
37	MITHILESH KUMAR MANDAL	19	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
38	PAPPUKUMAR MANDAL	26	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
39	DHARMENDRASINH B. RAVALJI	21	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
40	VIJAY PARMAR	30	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
41	JITENDRA MANDAL	26	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
42	SUNIL CHATUR	21	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
43	PRAVIN S. PATEL	30	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
44	ARPIT PATEL	27	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
45	YAGNIK HIRPARA	23	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
46	KRUPALSINH DODIYA	37	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
47	NITIN R. SHRIVASTAV	29	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
48	TARUNESH MOHAN	30	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
49	MANGAL SINGH	24	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
50	JAGDISH S. VASAVA	29	MALE	OPD	2/23/2021	2/23/2021	--	MINOR
51	DINESH SITARAM PAL	25	MALE	OPD	2/23/2021	2/23/2021	--	NO INJURY
52	ROHIT SHARMA	23	MALE	OPD	2/23/2021	2/23/2021	--	NO INJURY
53	PANKAJ SHARMA	19	MALE	OPD	2/23/2021	2/23/2021	--	NO INJURY


Hardikbhai Patel


Hitesh
Suryavanshi


Nitesh Bind


Ravi Merja


Smit Patel

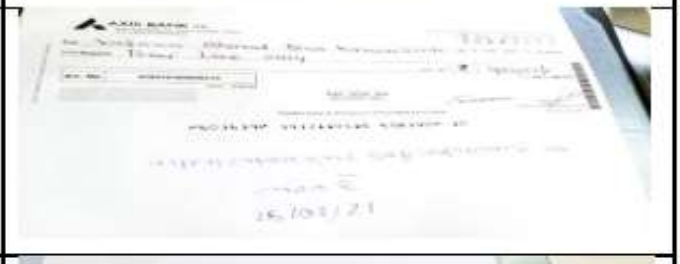

Mangal Yadav


Raushan
Kumar


Mayank
Parmar


Surendra Prasad


Bharat Vasava




Mangal Singh


Balbir


Kalyan
Yadav


Tularam
Yadav


Rajnish
Kumar

Summary of Medical Bills of Treatment

(as on 16 March 2021)

Serial No.	Details	Annexure No.	Amount (Rs)
1	Shrimati Jayben Modi Hospital	Annexure 1	95,984
2	Shrimati Jayben Modi Hospital sanchalit medical store	Annexure 1	88,993
3	Miraj MRI / Multi Slice CT Scan	Annexure 1	32,200
4	Healing touch Hospital - Interim bill	Annexure 1	540,827
	Total		**758,004**

Sincerely,

For, UPL Limited (Unit-05),

Anil Mundada

Unit Head

Annexure - 15: Details about the list of hazardous chemicals with maximum storage quantity and availability of fire tenders of MAH unit in Jhagadia GIDC

M/s. UPL LTD (Unit -5)						
Sr. No.	Name of Hazardous chemicals	Max Storage Quantity :	Unit	Number of storage tank/cylinder/tonner:	Maximum Storage in Single Container	Above ground or Under Ground storage
1	Chlorine	207	MT	4 tanks	200 Ton	Above ground
2	Chlorine	205	MT	110 tonners	200 Ton	Above ground
3	Hydrogen	3064	NM3	536 Cylinders	2900 Nm3	Above ground
4	Hydrogen	150	NM3	Holder	130 NM3	Above ground
5	HydroChloric Acid	306	MT	tank	280 Ton	Above ground
6	Phosphorus Trichloride	250	MT	tank	200 Ton	Above ground
7	POCL3	30	MT	tank	20 Ton	Above ground
8	HSD	98	KL	tank	60 KL	Above ground
9	Acetone	10	KL	tank	7 KL	Under ground PESO tank farm
10	DEK	122	KL	tank	100 KL	Above ground
11	PCl5	10	KL	Carboys	7KL	Above ground
12	EDA	200	KL	tank	180 KL	Above ground
13	CS2	300	KL	tank	200 KL	Above ground under water blanketing
14	CS2 plant	3331	M3	Tank	2500 M3	Above ground under water blanketing
15	Tri Methyl Phosphite	20	Kl	Tank	15 KL	Above ground
16	T Butanol	25	KL	Tank	15 KL	Above ground
17	PDA	100	KL	Tank	80 KL	Above ground
18	Tetrahydrof uran-GF1	30	KL	Tank	25 KL	Above ground
19	Tetrahydrof uran-GF2	30	KL	Tank	25 KL	Above ground
20	Tetrahydrof uran-GF3	30	KL	Tank	25 KL	Above ground
21	Acrolein	20	KL	Tank	12 KL	Above ground
22	Acrolein-GF-2	20	KL	Tank	13 KL	Above ground
23	Acrolein-GF-3	20	KL	Tank	13 KL	Above ground
24	Acrolein-GF-1	50	KL	Tank	40 KL	Above ground
25	Methanol	70	KL	Tank	56 KL	Under ground PESO tank farm
26	Ethanol-GF1	12	KL	Tank	9.6 KL	Under ground PESO tank farm
27	Ethanol-GF2	75	KL	tank	65 KL	Under ground tank
28	Ethanol-GF3	75	KL	tank	65 KL	Under ground tank
29	Ethanol	167	KL	tank	142 KL	Under ground tank
30	Sodium Cyanide	200	Ton	Tin	190 Ton	Above ground
31	Coal	5000	Ton	open yard	5000 Ton	Above ground
32	EDC	37	MT	tank	30 KL	Above ground
33	EDC	15	MT	tank	12.75 KL	Above ground
34	Nitric acid	15	KL	tank	12 KL	Above ground
35	N-Heptane	35	KL	Drums	30 KL	Above ground
36	TEP/ Triethyl phosphate	118	KL	tank	88 KL	Above ground
37	TEP/ Triethyl phosphate	100	KL	tank	80 KL	Above ground
38	TMB/ Tetramethyl benzidine -GF-3	277	KL	tank	240 KL	Above ground
39	TMB/ Tetramethyl benzidine -GF-2	277	KL	tank	240 KL	Above ground
40	TMB/ Tetramethyl benzidine-GF-1	70	KL	tank	56 KL	Above ground
41	Propylene	100	KL	tank	72 KL	above ground enclosed tank
42	DEMP/ Diethyl MethylPhos phonate GF-1	12	KL	tank	9.6 KL	Above ground
43	DEMP/ Diethyl MethylPhos phonate GF-2	30	KL	tank	25 KL	Above ground
44	DEMP/ Diethyl MethylPhos phonate GF-2	30	KL	tank	25 KL	Above ground
45	Acetic acid	15	KL	tank	12 KL	Above ground
46	Acetic acid	15	KL	tank	12 KL	Above ground
47	Acetic acid	35	KL	tank	28 KL	Above ground
48	Chloro acetyl chloride (CAC)	44	KL	tank	40 KL	Above ground
49	MEPA	104	KL	tank	81 KL	Above ground
50	Aniline	123	KL	tank	100 KL	Above ground
51	Toluene	12	KL	tank	10 KL	Under ground tank
52	Acrylonitrile 3	30	KL	tank	20 KL	Above ground
53	Methyl Chloride	200	KL	tank	175 KL	Aboveground enclosed mounted tank
54	Ammonia	164	KL	tank	98 KL	Above ground
55	H2S Gas	13.5	MT	Pipe line	12 MT	Above ground
56	Ethyl Mercaptan	26	MT	tank	12 MT	Above ground

Total Area of the unit	8,87,000	sqm
Fire tender available	Chassis -	TATA 1613
	Water Capacity (litres)	5000
	Foam (litres)	500
	Pump (LPM)	2250
	Monitor (GPM)	1000
	Fire Water Reservoir (KL)	**17400**

M/s Vardhman Acrylics Limited, 755, GIDC Mega Estate, Jhagadia-393 110

Sr. No.	Name of Hazardous chemicals	State of Chemical	Max Storage Quantity (A)	Unit	Number of storage tank/cylinder /tonner:	Additional information
1	Acrylonitrile	Liquid	2100	MT	3 tanks	Toxic, Flammable
2	Vinyl Acetate	Liquid	160	MT	2 tanks	Flammable
3	Sodium Chlorate	Stored in dedicated AC godown in powder form	50	MT	1(AC room)	Explosive
4	Thioglycol	Liquid	8	MT	1 tank	Toxic, Flammable
5	High speed diesel	Liquid	250	KL	1 tank	Flammable
6	Furnace Oil	Liquid	1000	KL	2 tanks	Flammable
7	Chlorine	Liquid & Gas	4.5	MT	5 tonners	Toxic

Total Area of the unit 335349 sq m
Fire tender available Multipurpose Fire Tender having capacity 4500 liter water & 500 liter foam
Fire water reservoir

M/s. AIR LIQUIDE INDIA HOLDING PVT LTD

Sr. No.	Name of Hazardous (Flammable/toxic) :	Max Storage Quantity :	Unit	Number of storage tank/cylinder/tonner:	Maximum Storage in Single Container (Largest	Above ground or Under Ground	Any additional information if any
1	Hydrogen Gas-Flammable	1	Tons	1553 Cylinders	Capacity-0.21 Tons and 275 Hydrogen cylinders	All cylinders are above the ground	Having 2 road trailers for H2 gas and each trailer is having 231 cylinders
2	Liquid Oxygen	704	Tons	3 storage tanks (2 Tanks with capacity-340 Tons and 1 tank-24 tons capacity)	340 tons Capacity	Above the gound	

Total Area of the 20234 sq m
Fire tender Not Available

M/s. KLJ Organic Ltd							
Sr. No.	Name of Hazardous chemicals (Flammable/toxic):	Max Storage Quantity :	Unit	Number of storage	Maximum Storage in	Above ground or Under Ground storage	Any additional information if any
1	Chlorine in tonner	45	MT	50	900 kgs	Above Ground	-
2	HCl in storage tanks	500	MT	8	90 T	Above Ground	-

Total Area of the unit sq m
Fire tender available Not Available

M/s. Panoli Intermediates (India) Pvt. Ltd.								
Sr. No.	Name of Hazardous chemicals (Flammable/toxic)	Max Storage Quantity :	Unit	Number of storage tank/cylinder/tonner:	Maximum Storage in Single Container (Largest Container) :	Above ground or Under Ground storage	Any additional information if any	Any additional information if any
1	Monochloro Benzene	750	MT	3	275 KL	Above	(Bulk storage/cylinder/tonner).	
2	Orthodichloro Benzene	600	MT	2	300 KL	Above		
3	Benzene	450	MT	15	30 KL	Underground		
4	Methanol	65	MT	3	30 KL	1 Underground,2 Above		
5	Ammonia Gas	1.2	MT	In process	In process	In process		
6	Hydrogen	1		2 KM	50 Kgs/Cm2	3''		
7	Chlorine	1		1.5 KM	3 Kgs/Cm2	6''		

Total Area of the unit 30540 sq m
Fire tender available Not Available
Fire Water Reservoir 200 KL

M/s. Aarti Industries Limited						
Sr. No.	Name of Hazardous chemicals (Flammable/toxic):	Max Storage Quantity :	Unit	Number of storage tank/cylin	Maximum Storage in Single	Above ground or Under Ground storage
1	HCL (33%)	25	KL	1	20 KL	Above ground
2	Caustic	5	MT	1	3 Ton	Above ground
3	HCL (33%)	15	KL	1	10 KL	Above ground
4	Caustic	10	MT	1	5 Ton	Above ground
5	NaCL	1	MT	1	200 Kg	Above ground
6	Furnance Oil	58	KL	1	40 KL	Above ground
7	Ammonia	240	Kg	-	240 Kg	Above ground
8	Thermic Fluid (Heat Transfer Oil)	50	KL	1	40 KL	Above ground
9	Diesel	40	KL	1	38 KL	Above ground
10	Toluene (207 B)	140	KL	1	120 KL	Under Ground storage
11	Toluene day tank (B 7)	5	KL	1	4.5 KL	Above ground
12	HNO3 (T -1)	100	KL	1	75 KL	Above ground
13	H2SO4 (T-2)	200	KL	1	180 KL	Above ground
14	H2SO4 (203 -A)	100	KL	1	90 KL	Above ground
15	Spent (204 B)	75	KL	1	60 KL	Above ground
16	Wash water (B-1)	12	KL	1	8 KL	Above ground
17	Alkali water (B-3)	10	KL	1	7 KL	Above ground
18	Acidic water tank (B-8)	20	KL	1	16 KL	Above ground
19	Crude Nitro toluene (T-4)	4	KL	1	3 KL	Above ground
20	Benzene day tank (T- 105)	5	KL	1	3 KL	Above ground
21	Acidic benzene day tank (T-101)	5	KL	1	3 KL	Above ground
22	Spent day tank (T-103)	5	KL	1	3 KL	Above ground
23	Acidic NB day tank (T-104)	6	KL	1	4 KL	Above ground
24	NB Storage T-102)	60	KL	1	45 KL	Above ground
25	DNB Wash water (T-109	10	KL	1	4 KL	Above ground
26	Acodic water tank (T-110)	10	KL	1	8 KL	Above ground
27	DNB Receiver (T-106)	10	KL	1	7 Kl	Above ground
28	DNB storage tank ((T3)	100	KL	1	80 Kl	Above ground
29	Alkali water tank (108 A)	15	KL	1	10 KL	Above ground
30	Alkali water tank (108 B)	15	KL	1	10 KL	Above ground
31	Spent day tank (T 107)	8	KL	1	6 Kl	Above ground
32	Spent storage tank (ST 418)	200	KL	1	180 KL	Above ground
33	Crude NT (ST 101)	200	KL	1	185	Above ground
34	ONT Pure (T-102)	43	KL	1	33	Above ground
35	ONT Pure (T-103)	43	KL	1	33	Above ground
36	MNT+ PNT (T 104)	200	KL	1	185 KL	Above ground
37	PNT Rich+ DNT pure (ST-109)	120	KL	1	95 Kl	Above ground
38	DNT+PNT (T-110)	27	KL	1	25 KL	Above ground
39	PNT Rich+ MNT pure (ST-112)	94	KL	1	70 KL	Above ground
40	Pure MNT (T 113)	30	KL	1	25 KL	Above ground
41	PNT rich + MNT (114)	85	KL	1	70 Kl	Above ground
42	MNT Rich (T-111)	70	KL	1	65 KL	Above ground
43	MNT Rich (T-117)	40	KL	1	30 KL	Above ground
44	MNT+ DNT= PNT (T- 108)	35	KL	1	30 KL	Above ground
45	Pure PNT (T 107)	35	KL	1	30 KL	Above ground
46	MNT+PNT (T 105)	45	KL	1	40Kl	Above ground
47	MNT+PNT (T 105)	70	KL	1	45 Kl	Above ground
48	MNT+PNT +DNT (T 116 A)	20	KL	1	15 KL	Above ground
49	MNT+PNT +DNT (T 116 B)	18	KL	1	15 KL	Above ground
50	Pure PNT (115 A)	35	KL	1	15 KL	Above ground
51	Pure PNT (115 B)	35	KL	1	15 KL	Above ground
52	MDNB ISO 604	25	KL	1	20 Kl	Above ground
53	MDNB ISO 605	25	KL	1	20 Kl	Above ground
54	MDNB ISO 101 A	25	KL	1	20 Kl	Above ground
55	MDNB ISO 101 B	25	KL	1	20 Kl	Above ground
56	3 4 DCNB	600	MT	1	500 Ton	Above ground
57	2 4 DCNB	400	MT	1	350Ton	Above ground
58	PNCB	210	MT	1	200 Ton	Above ground
59	3 5 DCNB	210	MT	1	200 Ton	Above ground
60	2 4 5 TCNB	110	MT	1	100 Ton	Above ground
61	2 3 DCNB	110	MT	1	100 Ton	Above ground
62	3 4 DCA	410	MT	1	320 Ton	Above ground
63	2 5 DCA	450	MT	1	400 Ton	Above ground
64	PCA	240	MT	1	200 Ton	Above ground
65	3 5 DCA	160	MT	1	140 Ton	Above ground
66	2 4 5 TCA	130	MT	1	120Ton	Above ground
67	2 3 DCA	120	MT	1	100 Ton	Above ground
68	METHANOL	40	MT	1	34 Ton	Above ground
69	PLATINUM CATALYST	200	Kg	-	200Kg	Under Ground
70	PALADIUM CATALYST	200	Kg	-	200Kg	Above ground
71	ORTHO TOLUDINE	35	MT	1	32 Ton	Above ground
72	HNO3 (T -201A/B)	150	MT	1	120Ton	Above ground
73	Benzene	130	MT	1	125Ton	Under Ground
74	ODCB & day tank	550	MT	1	500 Ton	Above ground
75	NB Storage-205 A& day tank	220	MT	1	180 Ton	Above ground
76	Spent acid	470	MT	1	420 Ton	Above ground
77	3,4 DCNB	250	MT	1	225 Ton	Above ground
78	2,3 DCNB	100	MT	1	80 Ton	Above ground
79	DNB Crude	400	MT	1	350 Ton	Above ground
80	3,5 DCNB	200	MT	1	170 Ton	Above ground
81	2,4,5 TCNB	400	MT	1	350Ton	Above ground
82	H2O2	10	KL	1	10 KL	Above ground
83	FESO4	10	KL	1	10 KL	Above ground
84	DNB waste water(A)	30	KL	1	15 Kl	Above ground
85	DNB waste water(A)	30	KL	1	15 Kl	Above ground
86	NT waste water (A)	10	KL	1	10 KL	Above ground
87	NT waste water (B)	10	KL	1	10 KL	Above ground
88	DCA wate water	30	KL	1	30 KL	Above ground
89	Benzene	196	MT	5	170MT	Under Ground

Total Area of the unit — sq m
Fire tender available — One Multipurpose Fire Tender
Water Capacity: 5000 L
Foam Capacity: 1000 L

M/s. Gujarat Guardian Limited-Valia							
Sr. No.	Name of Hazardous chemicals	Max Storage Quantity :	Unit	Number of storage tank/cylinder/tonner:	Maximum Storage in Single Container (Largest Container) :	Above ground or Under Ground storage	Any additional information if any
1	LPG	225	MT	4	56.25	Above ground	(Bulk storage/cylinder/tonner), (Flammable/toxic)
2	Ammonia	20.2	MT	2	10.1	Above ground	

Fire tender Not Available

DCM Shriram Ltd. (Unit: Shriram Alkali & Chemicals) plot no. 749, GIDC Indusrial estate, Jhagadia							
Sr. No.	Name of Hazardous chemicals	Max Storage Quantity :	Unit	Number of storage tank/cylinder /tonner:	Maximum Storage in Single Container (Largest Container) :	Above ground or Under Ground storage	Any additional information if any
1	Sodium hydroxide	1923	M3	2	1500	Above ground	Dyle wall available
2	Sodium hydroxide	1100	M3	3	800	Above ground	Dyle wall available
3	Chlorine	100	MT	4	80	Above ground	QRA done
4	Chlorine	92.5	MT	1	80	Above ground	
5	Chlorine	900	Kgs	2016 Tonner	2000 cylinders	Above ground	
6	Hydrochloric acid	127	M3	4	100	Above ground	Dyle wall available
7	Hydrochloric acid	265	M3	2	200	Above ground	Dyle wall available
8	Sulfuric acid(98%)	74.5	M3	1	60	Above ground	Dyle wall available
9	Sulfuric acid(70%)	74.5	M3	1	60	Above ground	Dyle wall available
10	Hydrogen	4240	NM3	Cylinder s	4240 NM3	Above ground	QRA done
11	Hydrogen	9602	NM3	Cylinders	9602 NM3	Above ground	QRA done
12	Furnace Oil	800	KL	1	640 KL	Above ground	QRA done
13	HSD	270	KL	1	200 KL	Above ground	QRA done

Fire tender available 1, 5000, water capacity, 500 ltr Foam compound

M/s. Lanxess India Pvt. Ltd.							
Sr. No.	Name of Hazardous chemicals	Max Storage Quantity : (A)	Unit	Number of storage tank/cylinder/tonner:	Maximum Storage in Single Container (Largest Container) :	Above ground or Under Ground storage	Any additional information if any
1	4-Aminodiphenylamine	200	M3	02 Tanks	100 M3	Above ground	
2	Acetone	256	M3	08 Tanks	32 M2	Under Ground	
3	Acrylonitrile	50	M3	03 Tanks	25 M3	Above Ground	
4	Amine-Z	100	M3	02 Tanks	50 M3	Above Ground	
5	Ammonia	50	M3	01 Tank	50 M3	Above Ground	
6	Aniline	100	M3	01 Tank	100 M3	Above Ground	
7	Chloro methyl methyl ether (CME)	16	M3	02 Tanks	16 M3	Above Ground	
8	DCE	25	M3	01 Tank	25 M3	Above Ground	
9	Diethylene triamine (DETA)	100	M3	02 Tanks	50 M3	Above Ground	
10	Dimethyl Amine (DMA)	25	M3	01 Tank	25 M3	Above Ground	
11	DMEA	25	M3	01 Tank	25 M3	Above Ground	
12	DVB 80%	50	M3	01 Tank	50 M3	Above Ground	
13	H2SO4	100	M3	02 Tanks	50 M3	Above Ground	
14	HCL	35	M3	02 Tanks	30 M3	Above Ground	
15	Hydrogen gas	-		-	-	-	No storage facility
16	Methyl chloride	14	Tonne	14 tonners	700 kg	Above Ground	
17	Methyl Ethyl Ketone	200	M3	03 Tanks	100 M3	Above Ground	
18	Methanol	45	M3	01 Tank	45 M3	Above Ground	
19	Methyl Acrylate	40	drums	Drum	180 kg	Above Ground	
20	Methylal	8	M3	01 Tank	8 M3	Above Ground	
21	Methyl Isoamyl Ketone	32	M3	01 Tank	32 M3	Under Ground	
22	Methyl Isobutyl Ketone	96	M3	04 Tanks	32 M3	Under Ground	
23	NaOH	31	M3	02 tanks	30 M3	Above Ground	
24	Octadiene	5	M3	01 Tank	05 M3	Above Ground	
25	Oleum	25	M3	02 Tanks	25 M3	Above Ground	
26	Paraformaldehyde	300	Bags	Bags	750 kg	Above Ground	
27	p-Nitroaniline (pNA)	150	M3	Bags	1000 kg	Above Ground	
28	Styrene	95	M3	01 Tank	95 M3	Above Ground	
29	Tri-n-butylamine	25	M3	01 Tank	25 M3	Above Ground	
30	Trimethyl Amine (TMA)	25	M3	01 Tank	25 M3	Above Ground	
31	Toluene	32	M3	01 Tank	32 M3	Under Ground	

Total Area of the unit 182400 sq m

Fire tender available One Multi-Purpose fire tender with 3000 liters water, 1000 liters foam

Fire Water Reservoir 3000 KL

M/s. Borocil							
Sr. No.	Name of Hazardous chemicals	Max Storage Quantity :	Unit	Number of storage tank/cylinder/tonner:	Maximum Storage in Single Container (Largest Container) :	Above ground or Under Ground storage	Any additional information if any
1	LPG	58	MT	02 Bullets	30 MT	Above ground storage	