

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

ORIGINAL APPLICATION No. 73 OF 2021 (SZ)

In The Matter of:

Visakha Pawan Praja Karmika Sangham,
Andhra Pradesh

.....Applicant (s)

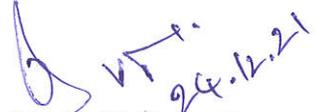
Verses

Union of India and others.

....Respondent (s)

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REPORT OF THE JOINT COMMITTEE IN THE MATTER OF O. A. NO. 73 / 2021
TITLED: VISAKHA PAWAN PRAJA KARMIKA SANGHAM Vs UNION OF INDIA
AND OTHERS, SUBMITTED TO HON'BLE NATIONAL GREEN TRIBUNAL,
SOUTHERN ZONE, CHENNAI IN COMPLIANCE TO HON'BLE NGT ORDER
DATED 17.09.2021.

1. Preamble:

The Hon'ble NGT in its order dated 17.09.2021 in the case of OA 73 of 2021 (SZ) directed to the Joint Committee as below:

.....“9. They have not mentioned what is the extent of green belt developed and also whether there is any possibility of developing green belt in that area and if it could not be developed within the complex, what is the further remedial measures to be taken for improving the green belt within the permissions to mitigate air as well as odour pollution.

10. The Committee has also not mentioned as to whether the guidelines provided by the Indian Institute of Science in 2016 have been complied with by the 7th respondent or not. Further, it is seen from the report that the violations are in existence since long time and even earlier certain deficiencies have been found and notice have been issued by the Pollution Control Board in that regard. So, the number of days of violation taken appears to be not correct. They will have to take the cumulative act of violations for the purpose of ascertaining the number of days violated for the purpose of calculating the compensation, which has been reiterated by the Principal Bench as well as this Tribunal in several cases of this nature.

11. So, under such circumstances, we direct the Committee to re-visit those aspects and submit a further report incorporating their suggestions and recommendations on the basis of the observations made by this Tribunal.

13. The Committee as well as MoEF&CC and Pollution Control Board are directed to file their further reports to this Tribunal on or before 12.11.2021”

The copy of the NGT order dated 17.09.2021 is enclosed as Annexure - 1.

2. Meeting and inspection of the Joint Committee:

The Joint Committee deliberated through VC on October 1, 2021 and December 10, 2021 for the compliance of Hon'ble NGT order dated 17.09.2021. The committee visited M/s HPCL, Visakhapatnam on December 14, 2021 and verified the compliance w.r.t recommendations made by Indian Institute of Science (IISc), Bengaluru in 2016 and development green belt in the industry.

3. Status of Green belt developed by M/s HPCL (Visakh Refinery), Visakhapatnam:

As reported by unit representative, total area of Refinery after expansion is 860 acres and total green belt developed inside the unit is 112.5 acres. The unit via mail dated July 6, 2016 informed APPCB that being a brown field project, there was no adequate space available within the refinery for additional green belt development. The unit under "Green Visakha Programme" had planted 4,50,000 saplings till 2015. APPCB while issuing CFE for expansion in order dated July 6, 2016 and one of the conditions was additional plantation of 2,00,000 saplings to be undertaken and completed during 2016-17. In compliance to the CFE conditions, the unit planted in major areas of Visakhapatnam city viz. Autonagar, Vadlapudi, Parawada, Sheelanagar, Aganampudi, Denkada etc. and planted 2,00,000 saplings. The saplings after maintaining for one year, handed over to Forest Department and the copy of same is enclosed as Annexure 2.

4. Compliance Status of M/s HPCL (7th respondent) for recommendations by IISc, Bengaluru:

S. No.	Recommendations by Indian Institute of Science (IISc), Bengaluru	Compliance Status
1	Even if industries follow the good practices and maintain the emissions within the limits, there are possibilities of episodic odour issues. In such cases, it is a responsibility of each and every industry in the region towards community to cooperate and participate in taking the odour problem in Visakhapatnam area.	Complied It was reported that whenever, the information of odour complaints received from APPCB, the unit had responded quickly and inspected the process area for any leakages. The unit had also interacted with public & APPCB and provided required

		<p>information.</p> <p>It was also reported by RO, APPCB, Visakhapatnam that from past two years no complaints have been received for odour nuisance.</p>
2	<p>APPCB being the nodal agency should form an odour squad comprising members from APPCB, each stake holder industry, prominent community members and experts in environmental areas. Typical tasks of the squad should include:</p> <ul style="list-style-type: none"> • In case of any episode, the APPCB nominee to inform all members about the complaint and locations. • The squad to visit the site and take ambient air samples in Teddler bags which should be stored under appropriate conditions and transported immediately (for GC-MS analysis) to a recognized laboratory. • Upon receiving the complaints from the squad, each industry should check for abnormal emissions/operating conditions, if any, in their industry and report to APPCB and take necessary actions. 	<p>Not applicable to M/s HPCL and pertains to APPCB.</p> <p>APPCB has not established the Odour Squad; however, it was informed that an Emergency Response team has been constituted after the incidents occurred in M/s LG Polymers India Pvt. Ltd., and M/s Sainor Life Sciences Pvt. Ltd. The copy of the circular memo is enclosed as Annexure 3.</p>
3	<p>APPCB should initiate a community medical study to correlate the mortality rates before and after the odour episodes and compare the data during non-episodes to evaluate the hazard.</p>	<p>This recommendation is not applicable to M/s HPCL and pertains to APPCB.</p> <p>APPCB has not initiated a community</p>

		medical study. It was informed by APPCB that no such odour episodes were occurred in recent past.
4	Use of respiratory masks must be encouraged whenever odour is experienced.	Complied The unit has made mandatory for all staffs and workers to use PPEs in refinery premises.
5	Public education is an important concept in odour management. The odour squad should strive to impress upon the people of Visakhapatnam that the common odour one might smell from the industries or any other source will not have serious impact to the average person's health if released in small amounts. It is important to maintain public decorum and take steps to mitigate the panic among the general public through proper education.	Partially complied No such public educations were carried out by industries or APPCB for odour issues. However general environmental awareness programs are being carried out. Committee feels that all industries and APPCB jointly should organize public awareness programs to educate about odour & other pollution problems.

5. Assessment of Environmental Compensation (EC) for non-compliances:

The committee earlier in calculation of EC had considered the directions issued by APPCB after the recommendations of IISc, Bengaluru and for non-compliances observed during inspection. The committee examined the earlier directions issued by APPCB for non-compliances of CFO & CFE conditions and also for odour nuisances. APPCB had issued directions under Section 33 (A) of Water (Prevention and Control of Pollution) Amendment Act 1988 and Section 31 (A) of Air (Prevention and Control of Pollution) Amendment Act 1988 and under, 1987 to M/s HPCL on 14/12/2011, 16/02/2012, 3/10/2016 and 19/03/2020 for non compliances. The copy of the directions issued by APPCB is enclosed as Annexure 4. Hence, the Committee observed that there was a repeated violations by the unit from 2011 onwards and decided to consider the no. of

violations from the date of directions issued by APPCB on 14/12/2011 and recommends levying environmental compensation on the Visakh refinery as detailed below:

$$EC=PI \times N \times R \times S \times LF$$

Where,

EC = Environmental Compensation in INR

PI = Pollution Index of industrial sector (red-80)

N = Number of days of violation took place (date of direction issued to date of compliance verification.)

R = A factor in Rupees for EC (Rs. 100/- may be assumed)

S = Factor for scale of operation (large-1.5)

LF = Location factor (present in Visakhapatnam where population is more than 10 lakh=2)

- i. Pollution Index of industrial sector (PI): Andhra Pradesh Pollution Control Board has categorized this industry into red category of industries and accordingly the combined consent & Authorisation have been granted. For red category of industries, average pollution index is 80.
- ii. Number of days of violation (N): The number of days for which violation took place is considered as the period between the day of violation observed and day of compliance verified by the CPCB/APPCB. From the available records, APPCB issued directions to HPCL on 14/12/2011 and committee verified the compliances on June 23, 2021. Based on the criteria, 3480 days (from 14.12.2011 to 23.06.2021 including both the days) is considered for calculation of period of violation for estimating EC.
- iii. Scale of operation (S): The industry is considered as large as per the capital investment by the industry. Thus, scale of operation (S) for EC estimation is considered as 1.5.
- iv. Location factor (LF): The industry is located in Malkapuram and the total population within municipal boundary and up to 10 km distance from the municipal boundary of the city is 10 million and above. Thus location factor (LF) is considered as 2 for EC estimation.

- v. Factor in Rupees (R) (Rs): As per the environmental compensation estimation guidelines, factor of rupees may be minimum of Rs 100/- and maximum of Rs 500/-. The Committee decided to take rupee factor as Rs. 100/- for estimating environmental compensation.

S.No.	Period of non-compliance	PI	S	LF	R (Rs)	N (days)	Environmental compensation (Rs)
1	14.12.2011 to 23.06.2021	80	1.5	2	100/-	3480	8,35,20,000/-
Total EC for violations						3480	8,35,20,000/-
Rupees eight crores thirty five lakhs and twenty thousand only.							

6. Conclusions and Recommendations

- i. The unit after expansion consists of 860 acres and 112.5 acres is used for green belt development within the premises. At present the unit has no space for developing green belt inside the refinery. However, the unit has developed green belt outside the premises and major areas of Visakhapatnam city viz. Autonagar, Vadlapudi, Parawada, Sheelanagar, Aganampudi, Denkada etc.
- ii. The recommendations made by IISc, Bengaluru pertaining to M/s HPCL, Visakhapatnam (7th respondent) have been complied.
- iii. The committee revisited the no. of days of violations by M/s HPCL and takes the violations date as the date of directions issued by APPCB on 14/12/2011 till 23/06/2021 the day of committee inspected and observed the non-compliances. Hence, for the repeated violations committed by HPCL, Rupees eight crores thirty five lakhs and twenty thousand of EC has been calculated and levied.
- iv. M/s HPCL may be directed to deposit Rs. 8,35,20,000/- with APPCB.
- v. M/s HPCL may be directed to comply with all conditions of Environmental Clearance, Consent For Establishment & Consent For Operate and submit the compliance report to APPCB.
- vi. APPCB may be directed to verify compliance submitted by M/s HPCL and take necessary actions for non-compliances.

- vii. APPCB may be directed to constitute the odour Squad as per the recommendations of IISc, Bengaluru to initiate action and resolve the odour episodes. The APPCB and industries shall jointly organize awareness programmes for public on odour & pollution matters.

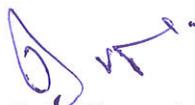
Report dated December 17, 2021.



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Item No.01:

BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

Original Application No. 73 of 2021 (SZ)

(Through Video Conference)

IN THE MATTER OF:

Visakha Pawan Praja Karmika sangam

... Applicant(s)

Vs.

Union of India & Ors.

...Respondent(s)

Date of hearing: 17.09.2021

CORAM:

HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER

HON'BLE MR. SAIBAL DASGUPTA, EXPERT MEMBER

For Applicant(s):

Mr. Sravan Kumar

For Respondent(s):

Mr. Surya Prabhu for Mr. G.M, Syed Nurullah
Sheriff for R1.

Mr. Basu for Ms. Madhuri Donti Reddy for R4 to
R6

Mr. Kumaresan for M/s King & Partridge for R7

ORDER

1. As per order dated 25.02.2021, this Tribunal had admitted the matter and appointed a Joint Committee to go into the question and submit a report and the case was originally posted to 12.04.2021 for that purpose. On 12.04.2021, it was adjourned for completion of pleadings and also for filing of report to 27.05.2021. On 27.05.2021 also it was adjourned for completion of pleadings and consideration of report, since the report has not been filed.

2. Further this Tribunal had directed the Committee to consider the allegations made in the newspaper report published in News Minutes dated 25.05.2021 regarding a fire incident occurred in the 7th respondent unit. Pollution Control Board was directed to inspect and submit their independent report. The case was posted to 28.06.2021 for that purpose. Thereafter, the matter has been adjourned from time to time and lastly it was adjourned to today as per notification dated 15.09.2021.

3. The Joint Committee has filed a report dated 19.07.2021 e-filed on 26.07.2021 and received on the same date which reads as follows:

REPORT OF THE JOINT COMMITTEE ON THE FIRE ACCIDENT OCCURRED IN CDU – III OF M/s. HINDUSTAN PETROLEUM CORPORATION LTD., VISAKH REFINERY, MALKAPURAM, VISAKHAPATNAM, ANDHRA PRADESH IN THE MATTER OF O. A. NO. 73/2021 TITLED: VISAKHA PAWAN PRAJA KARMIKA SANGHAM Vs UNION OF INDIA AND OTHERS, SUBMITTED TO HON'BLE NATIONAL GREEN TRIBUNAL, SOUTHERN ZONE, CHENNAI IN COMPLIANCE TO HON'BLE NGT ORDER DATED MAY 27, 2021.

1. Preamble:

The Hon'ble NGT in its order dated 27.05.2021 in the case of OA 73 of 2021 (SZ) directed to the Committee as below:

.....11. "The committee as well as the Pollution Control Board are also directed to take this also into consideration while assessing the environmental compensation if any to be assessed if there is any violation found."

The copy of the NGT order dated 27.05.2021 is enclosed as *Annexure - 1*.

2. Fire Accident at M/s HPCL, Visakh Refinery, Visakhapatnam, Andhra Pradesh:

A fire accident occurred at M/s HPCL, Visakh Refinery in Crude Distillation Unit – III(CDU – III) on May 25, 2021 at 15:10 hrs.

2.1 Causes for fire accident:

The following are the causes for the fire accident at CDU –III:

- i. The mechanical failure of one of the pipeline elbows on the pump discharge line caused leak in the 6" Carbon Steel (CS) pipeline carrying vacuum residue which contains fuel oil/ bitumen at a temperature of about 350⁰ C & pressure of 16 kg/cm². A hole about 2.5" - 3" was formed (may be due to corrosion) and drained the fluid with high pressure, which resulted in the auto ignition of the hydrocarbon fluid (auto ignition temperature of the vacuum residue fluid is 280⁰C) caused fire at deck 1(first floor) of the CDU-III.

- ii. The fire further extended to deck2 and air fin coolers (deck 3) of the CDU-III. The flames at deck 3 resulted in the rupture of atmospheric column overhead pipeline carrying Naphtha and leading to fire from this location.

3. Measure taken by M/s. HPCL, District collector and APPCB after the fire accident:

3.1 Immediate measure taken by M/s. HPCL(Visakh Refinery):

When the unit noticed black smoke and fire at 15.06 hrs. from the ground floor (deck 1) of the CDU –III, the emergency shutdown of the CDU was taken at 15.07 hrs and all the motor pumps were stopped. The emergency siren was raised at 15.07hrs, the Emergency Response & Disaster Management Plan (ERDMP) of the Refinery was activated immediately and the fire & safety crew reached the area and carried out fire fighting activities using foam tender and dry chemical powder tender. The fire was extinguished at 16:10 hrs, cooling operations were continued in the surrounding area and all clear siren was given at 16:15 hrs. No injury or casualties were reported.

M/s. HPCL Visakh Refinery has submitted the investigation report, dated 03.06.2021 to the Director Refineries on the fire accident occurred in the CDU – III of the refinery on 25.05.2021, wherein reported the cause of the fire accident as,

- 3.1.1 The probable cause is mechanical failure of the 6” hydrocarbon (Vacuum residue) pipe line elbow. This has resulted in release of hydrocarbon (Vacuum residue) at 350°C.
- 3.1.2 The ignition source is the high temperature (above the auto ignition temperature) of the leaked vacuum residue itself.

Copy of the report enclosed (Annexure – 2).

3.2 Immediate measure taken by District Collector, Visakhapatnam, Andhra Pradesh:

On hearing the news of fire accident at HPCL, the officials from the distractive administration reached the unit around 15:25 hrs as per the instruction of District Collector. The RDO, Joint Chief Inspector of Factories, District Fire Officer, officials from the industries department and APPCB reached the site and given necessary instruction to combat the fire for the Emergency response team of HPCL.

The Collector and District Magistrate, Visakhapatnam Dt.25/05/2021 constituted a Committee with the following Members to enquire into the incident of fire at M/s HPCL, Visakh Refinery with a direction to inspect the incident place and to submit the report.

1	Revenue Divisional Officer, Visakhapatnam	Head of the Committee
2	General Manager, District Industries Centre, Visakhapatnam	Member
3	Joint Chief Inspector of Factories, Visakhapatnam	Member
4	District Fire Officer, Visakhapatnam	Member
5	Environmental Engineer, APPCB, Visakhapatnam	Member
6	HOD of Chemical Engineering, IPE	Member
7	Associate Dean of Students Affairs & Assistant Professor, Chemical Engineering, IPE	Member
8	Assistant Professor, Chemical Engineering, IPE	Member
9	Professor, Chemical Engineering department, Andhra University	Member
10	Professor, Chemical Engineering department, Andhra University	Member

The committee constituted by the DC visited M/s HPCL on 28.05.2021 and the detailed report was submitted to the District Collector.

3.3 Immediate action taken by APPCB, Visakhapatnam, Andhra Pradesh:

APPCB immediately rushed to the incident site by 15:40 hrs along with scientific staff of Zonal Laboratory, Visakhapatnam and immediately started monitoring the ambient air in the surrounding areas through Mobile lab in the down wind direction. The Total Volatile Organic Carbons (TVOCs) were monitored in ambient air at various points from the fire accidents and also outside the unit premises. Samples of wastewater generated during fire-fighting operations and accumulated in the drain at CDU-III were collected. The values of TVOC recorded during fire accident were ranging from 0.2 PPM to 7.4 PPM and outside the premises, the maximum TVOC of 0.2 PPM was recorded. Analysis report enclosed as Annexure – 3.

Data of the 3 CAAQM Stations being operated by M/s. HPCL within the premises pertaining to the date of fire accident (25.05.2021) was also collected. The results are given below:

3.3.1 At Southgate CAAQM Station (South side to the Industry):

- PM10 values increased from 202 $\mu\text{g}/\text{m}^3$ (14.00 hrs) to 319 $\mu\text{g}/\text{m}^3$ (17.00 hrs) during the accident period. Minimum value of 93 and maximum value of 319 $\mu\text{g}/\text{m}^3$ was observed during the day of accident on 25.05.2021.
- PM2.5 values increased from 37 $\mu\text{g}/\text{m}^3$ (14.00 hrs) to 47.9 $\mu\text{g}/\text{m}^3$ (16.00 hrs) during the accident period. Minimum value of 22 and maximum value of 52 $\mu\text{g}/\text{m}^3$ was observed during the day of accident on 25.05.2021.
- NOx values increased from 17 $\mu\text{g}/\text{m}^3$ (14.00 hrs) to 142 $\mu\text{g}/\text{m}^3$ (16.00 hrs) during the accident period. Minimum value of 05 and maximum value of 132 $\mu\text{g}/\text{m}^3$ was observed during the day of accident on 25.05.2021.
- No significant change in the SO₂ concentrations were observed during the fire accident period. Minimum value of 05 and maximum value of 132 $\mu\text{g}/\text{m}^3$ was observed during the day of accident on 25.05.2021.
- Average value of Air Quality Index (AQI) during the day of accident (25.05.2021) at this location found to be 143, i.e. moderate category. Value of PM10 is exceeding the standard limit prescribed for 24 hour average.

3.3.2 At store yard CAAQM Station (West side to the Industry)

- PM10 value increased from 365 $\mu\text{g}/\text{m}^3$ (14.00 hrs) to 511 $\mu\text{g}/\text{m}^3$ (15.00 hrs) during the accident period. Minimum value of 120 and maximum value of 608 $\mu\text{g}/\text{m}^3$ was observed during the day of accident on 25.05.2021.
- PM2.5 values increased from 73 $\mu\text{g}/\text{m}^3$ (14.00 hrs) to 99 $\mu\text{g}/\text{m}^3$ (15.00 hrs) during the accident period. Minimum value of 37 and maximum value of 99 $\mu\text{g}/\text{m}^3$ was observed during the day of accident on 25.05.2021.

- NO_x values recorded 26.77 µg/m³ (13.15 hrs) and increased to 35.49 µg/m³ (17.30 hrs) during the accident period. Minimum value of 0.6 and maximum value of 11.84 µg/m³ was observed during the day of accident on 25.05.2021.
- No significant change in the SO₂ concentrations were observed during the fire accident period. Minimum value of 11.76 and maximum value of 37.74 µg/m³ was observed during the day of accident on 25.05.2021.
- Average value of Air Quality Index (AQI) during the day of accident (25.05.2021) at this location found to be 204, i.e. poor category. Value of PM₁₀ is exceeding the standard limit prescribed for 24 hour average.

3.3.3 At HLPH CAAQM Station (Northeast side to the Industry)

- PM₁₀ value increased from 252 µg/m³ (15.00 hrs) to 267 µg/m³ (16.00) during the accident period. Minimum value of 130 and maximum value of 411 µg/m³ was observed during the day of accident on 25.05.2021.
- PM_{2.5} values increased from 26 µg/m³ (14.00 hrs) to 30 µg/m³ (16.00 hrs) during the accident period. Minimum value of 21 and maximum value of 153 µg/m³ was observed during the day of accident on 25.05.2021.
- NO_x values increased from 15.8 µg/m³ (14.45 hrs) to 59.7 µg/m³ (15.45 hrs) during the accident period. Minimum value of 15.81 and maximum value of 110 µg/m³ was observed during the day of accident on 25.05.2021.
- As far as the SO₂ concentrations are concerned, minimum value of 30.34 and maximum value of 510 µg/m³ was observed during the day of accident on 25.05.2021.
- Average value of Air Quality Index (AQI) during the day of accident (25.05.2021) at this location found to be 186, i.e. moderate category. Values of PM₁₀, PM_{2.5} and SO₂ are exceeding the standard limits prescribed for 24 hour average.

Ambient air quality data obtained from these CAAQM stations enclosed as Annexure – 4.

APPCB has deployed Mobile CAAQM Station Lab and monitored the ambient air quality in the neighboring residential area, Ajanta colony, Malkapuram for a period of 24 hours on 25.05.2021 and 26.05.2021 to assess the impact of fire accident occurred at M/s. HPCL and the values found to be:

- PM10 values: Minimum 70 µg/m³; maximum 177 µg/m³; average 124 µg/m³.
- PM2.5 values: Minimum 14 µg/m³; maximum 56 µg/m³; average 33 µg/m³.
- NO_x values: Minimum 14.5 µg/m³; maximum 44.8 µg/m³; average 26.7 µg/m³.
- SO₂ values: Minimum 6.3 µg/m³; maximum 34.1 µg/m³; average 21.8 µg/m³.
- AQI value: 116, i.e. moderate category.

Ambient air quality data obtained from the Mobile CAAQM station is enclosed as Annexure – 5.

The characteristics of wastewater generated during fire fighting operation found to be, TSS values ranging from 820 to 1160 mg/lit; COD values from 156 to 184 mg/lit and oil & grease from 8 to 14 mg/lit. Analysis report enclosed as Annexure – 6.

4. Site inspection and observations made by the Joint Committee appointed by Hon'ble NGT:

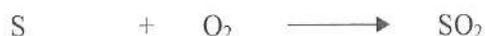
The committee inspected the fire accident site at M/s HPCL on June 23, 2021 and observed the following:

- a. The committee inspected the CDU-III area and physically verified the burnt pipelines and the impact area, deck 1, 2 & 3 floors, which were damaged due to the fire.
- b. It was informed by the unit representative that about 78 MTs of hydrocarbons was burnt in the fire accident, out of which 35 tons of bitumen/furnace oil and 43 tons of Naphtha.

- c. The cause for the fire was informed due to the hole in the 6" CS pipeline carrying the bitumen/furnace oil which may be due to the corrosion/erosion which led to mechanical failure. However, it was informed that the technical reasons for the sudden burst of the pipeline carrying bitumen/furnace oil is to be ascertained.
- d. The refinery has to carryout hydro-testing of the pipelines once in 4 years as per the protocol and carried out the said test in the year, 2012 & 2016. The next testing has to be carried out during the year, 2020. However, it was not conducted and informed that due to COVID-19 situation it got delayed. Self certified copy of the hydro-test report of M/s. HPCL (Visakh Refinery) is enclosed as Annexure – 7.
- e. During inspection, the debris from the fire accident was cleared and the preparation work for repair/ renovation was in progress.
- f. The high oil sludge of 5 KL from the CDU-III was collected in drums and stored in the sludge lagoons for the recovery of oil. The sludge lagoons was inspected and observed that the drums used for collection was dumped along with the sludge.
- g. The sea water of about 6000 KL was used for fire-fighting and informed that the wastewater collected in the drains of CDU-III was diverted to ETP-1 for treatment and discharged along with the cooling water.
- h. To combat the fire, Dry Chemical Powder of 2000 kg and foam tender of 5200 litres along with 6000 KL sea water were used.
- i. The detailed report from the Petroleum and Explosives Safety Organization (PESO), to ascertain the cause for fire accident is awaited.

5. Environmental damage assessment for contribution of emission into atmosphere:

During the fire accident on 25.05.2021 at CDU-III of M/s. HPCL, Visakhapatnam, an amount of 78 tons of hydrocarbons (35 tons Bitumen / Furnace oil and 43 tons of Naphtha) was burnt and emissions were let out into open atmosphere. The 78 tons of burnt hydrocarbons also contain an amount of 1.2 tons of sulphur (@3.4% Sulphur in Bitumen / furnace oil and 0.024% sulphur in Naphtha). Hence, an amount of 76.8 tons of *hydrocarbons and 1.2 tons of sulphur got burnt during the fire accident at M/s. HPCL on 25.05.2021 resulting in the emission of 211 tons of carbon dioxide and 2.38 tons of sulphur dioxide into the surroundings.



*While calculating the quantity of emission of CO₂, the burnt hydrocarbon during fire accident is considered as Methane (CH₄, the simplest hydrocarbon in the homologous series of alkanes) and 100% combustion.

Accordingly, the Joint Committee proposed to levy Environmental damage compensation on M/s. Hindustan Petroleum Corporation Ltd., (Visakh Refinery), Visakhapatnam as per the European Union “Environmental Prices Handbook” EU28 version published in October 2018 wherein prices are expressed in Euros per kilogram pollutant emitted into the environment. The committee has used the document as a reference to calculate the prices of the pollutants emitted into environment. The document indicates three types of pricing, lower, central and upper depending upon magnitude of emissions. The quantities of pollutants emitted were in considerable quantity, but, there was no significant damage to the surrounding environment, injury or casualties reported. Hence, the committee has used central limit environmental prices assigned to SO₂ & CO₂ while calculating the compensation for damage as detailed below. The environmental price of SO₂ is 11.5€₂₀₁₅/Kg emission and for CO₂ is 0.057 €₂₀₁₅/Kg emission, for CO₂ which is a greenhouse gas also includes VAT and increase in 3.5% per annum.

		Calculation for SO₂ emission		Calculation for CO₂ emission
Environmental Compensation for emissions contributed	=	2,380 Kgs of SO ₂ X Environmental price of SO ₂	+	2,11,000 Kgs of CO ₂ X Environmental price of CO ₂ with VAT of 3.5% per annum
	=	2,380 Kgs of SO ₂ X 11.5 €/Kg	+	2,11,000 Kgs X (0.057 €/Kg X 0.21)
	=	27,370 € 1€ = Rs. 89.028 (As on 25.05. 2021)	+	2,525.67 € 1€ = Rs. 89.028 (As on 25.05.2021)
	=	Rs. 24,36,696/-	+	Rs. 2,24,855/-
		Total of Rs. 26,61,551/- (rupees twenty six lakhs sixty one thousand five hundred and fifty one only)		

6. Recommendations of the Committee:

- The unit shall strictly follow the standard laid down protocols / Standard Operating Procedures (SOP) for Hydro testing of pipelines and immediately take precautionary

measures to avoid this type of fire accidents in future. The unit shall immediately take up hydro testing of the remaining two CDUs and confirm its efficiency.

- ii. The unit shall treat the high oily sludge waste of 5KL generated and collected during the fire accident occurred at CDU-III and the status report shall be submitted to APPCB.
- iii. The unit shall pay the compensation of Rs. 26,61,551/-(rupees twenty six lakhs sixty one thousand five hundred and fifty one only)towards damage of environment during the fire accident and the same shall be paid to APPCB.
- iv. To regularly conduct mock-drills to the employees in controlled environment on actions to be taken during failures, gas leakage etc.
- v. The committee humbly submits that the industries have to ensure self-compliance and the industry and its personnel are solely responsible for this negligent act which resulted in the accident. The industries have to adhere self-monitoring and self-compliance to avoid accidents or any other untoward incidents.

Report dated July 19, 2021.



Dr. Suresh Babu Pasupuleti
Scientist-C
Ministry of Environment, Forest & Climate
Change, Vijayawada



Smt. Poornima B M
Scientist D
Central Pollution Control Board
Regional Directorate, Chennai



Dr. B. V. Prasad
Senior Environmental Scientist
Andhra Pradesh Pollution Control Board
Vijayawada



Dr. N. Lingaiah
Senior Principal Scientist
Dept. of Catalysis & Fine Chemicals,
CSIR-IICT, Hyderabad

4. The Andhra Pradesh Pollution Control Board filed a report dated 17.06.2021, e-filed and received today in respect of fire incident occurred on 25.05.2021 in the 7th respondent unit along with certain report submitted by the District Collector which reads as follows:

Report submitted to the Hon'ble National Green Tribunal, Southern Zone, Chennai on fire accident occurred in Crude Distillation Unit -3 of M/s. Hindustan Petroleum Corporation Ltd., (Visakh Refinery), Malkapuram, Visakhapatnam District on 25.05.2021 at 15:10 Hrs.

Preamble:

The Hon'ble NGT conducted hearing on 27.05.2021 in connection with OA No. 73 of 2021(SZ) and directed APPCB to furnish detailed report on the fire accident which was occurred at Crude Distillation Unit (CDU)-III in M/s. Hindustan Petroleum Corporation Limited (Visakh Refinery) on 25.05.2021 at about 15:10 Hrs. The copy of the Hon'ble NGT order dated 27.05.2021 in O.A. No. 73 of 2021 is enclosed at Annexure-1. The details of the industry and detailed report on the fire accident are submitted as below:

1. Details of the industry:

i.	Name and Address of the industry	M/s. Hindustan Petroleum Corporation Ltd., (Visakh Refinery), Malkapuram, Visakhapatnam District, Andhra Pradesh
ii.	Line of Activity	Oil Refinery (Mineral Oil or Petro Refineries) This industrial sector is one among the '17 categories of Highly Polluting Industries'. Listed at S.No. 4(a) of Schedule of EIA Notification, 2006.
iii.	Category of the industry	Red Category.
iv.	Date of commissioning of industry	Refinery: Visakh Refinery in May - 1957; Visakh Refinery Expansion Project-I in January - 1985; Additional Tankage Project in May - 1998; Visakh Refinery Expansion Project-II in August to December - 1999, Diesel Hydro De-Sulphurization in June - 2000; Visakh Refinery Clean Fuel Project - 2010; LPG & Propylene Mounded Storage System in April'2010; Flue Gas De-Sulphurization-I in July-2013; Flue Gas De-Sulphurization-II in December, 2013; Diesel Hydro Treatment Project in Feb-2015; Visakh Refinery Modernization Project in December-2019;
v.	Total area of the plant	Total Area: 890 acres (Leased from M/s.Visakhapatnam Port Trust)
vi.	Surroundings of the Industry:	East: M/s. Indian Oil Corporation Limited Terminal West: M/s. Coromandel Fertilizers Limited, M/s. Hindustan Zinc Limited, M/s. Alufluoride etc., South: 80 Ft. Road (Scindia to Gajuwaka road) followed by residential area of Sriharipuram & Malkapuram.

		<p>North: M/s. Andhra Petro chemicals Limited.</p> <p>Distance from Nearest Habitation: Residential habitations on Southern side.</p> <p>Distance from Nearest water body: Meghadrigedda Surplus canal exists at a distance of about 1 Km which joins Bay of Bengal.</p>
vii.	Extent of Green belt developed in Acres	45.0 acres and in addition, the industry has planted about 6.0 lakhs samplings in Greater Visakhapatnam Municipal Corporation limits.

2. Products & By Products:

This is a petroleum refinery of capacity of 10 Million Metric Tons Per Annum(MMTPA) of Crude oil. The industry was issued Consent for Operation and Hazardous Waste Authorization(CFO & HWA) by the Board vide order dt: 09.03.2021 with a validity upto 31.12.2025 for the following products:

S.No.	Products	Capacity (For 10 MMTPA crude)TPA
1.	Propylene	36,000
2.	LPG - domestic	6,43,000
3.	Naphtha	1,73,000
4.	Gasoline (Euro - VI)	16,55,000
5.	Aviation Turbine Fuel(ATF)	1,20,000
6.	Superior Kerosene Oil(SKO)	5,21,330
7.	Diesel (Euro - VI)	37,86,670
8.	Furnace Oil(FO) @ 3.5% of Sulphur	16,62,000
9.	Furnace Oil(FO) @ 1.0% of Sulphur	2,37,670
10.	Bitumen	2,20,660
11.	Sulphur	56,370
12.	Refinery Fuel (fuel gas + fuel oil + Naptha for Gas Turbine Generators(GTGs))	7,41,670
	Total	1,00,00,000
	Captive power plant	121.20W

3. Details of fire accident occurred on 25.05.2021 and Environmental monitoring conducted by APPCB:

A fire accident was occurred in Crude Distillation Unit (CDU)-III of M/s.Hindustan Petroleum Corporation Limited (Visakh Refinery), Malkapuram, Visakhapatnam District on 25.05.2021 at about 15:10 Hrs. Immediately Emergency response and disaster management plan (ERDMP) of refinery was activated and fire fighting initiated. Fire call was given at 15.10 hrs and 6 Nos Fire tenders of M/s.HPCL(Visakh refinery) were pressed into firefighting operations. 8 nos Fire tenders with 48 member crew from AP State Disaster Response and Fire Service department, 4 nos Fire tenders with 26 member crew from Naval Dock Yard, 1 no Fire tender with 8 member crew from Vizag Port Trust and 1no Fire tender with 6 member crew from Hindustan Ship Yard came for necessary support and assistance in firefighting. These tenders were kept as stand by. The fire was completely extinguished and all clear was given at 16.15 hrs. The Joint Chief Inspector of Factories, Visakhapatnam has informed that the probable cause could be due to mechanical failure in the pipeline in Crude Distillation Unit-3 and the exact root cause will be established after thorough investigation by the Factories Department

who is prescribed authority and also informed that no injuries & casualties due to the accident.

After receiving the information from public about fire accident, officials of APPCB immediately rushed to the incident site by 15:40 Hrs along with scientific staff of Zonal Laboratory, Visakhapatnam and immediately started TVOC monitoring in ambient air about 10 m, 50 m & 100 m from the incident site and also carried out TVOC monitoring outside the industry premises. From the monitoring data it was observed that TVOC values recorded near to the incident area is ranging from 0.2 PPM to 7.4 PPM and outside the industry premises the maximum TVOC values recorded as 0.2 PPM. The Copies of the analysis reports are enclosed at Annexure-2. M/s. HPCL (Visakh Refinery) is operating 3 Continuous Ambient Air Quality stations at South gate, near HLPH and near Store yard. From the air quality data on 25.05.2021 (14.00 to 18.00 hrs) the following were observed:

- a. At Southgate CAAQM station (South side to the Industry)
 - PM₁₀ values increased from 202 µg/m³ (14.00 hrs) to 319 µg/m³ (17.00 hrs).
 - PM_{2.5} values increased from 37 µg/m³ (14.00 hrs) to 47.9 µg/m³ (16.00 hrs).
 - NO_x values increased from 17 µg/m³ (14.00 hrs) to 142 µg/m³ (16.00 hrs) and reduced to 37 µg/m³ (17.45 hrs)
- b. At HLPH CAAQM station (Northeast side to the Industry)
 - PM₁₀ values increased from 252 µg/m³ (15.00 hrs) to 267 µg/m³ (16.00 hrs).
 - PM_{2.5} values increased from 26 µg/m³ (14.00 hrs) to 30 µg/m³ (16.00 hrs).
 - NO_x values increased from 15.8 µg/m³ (14.45 hrs) to 59.7 µg/m³ (15.45 hrs) and reduced to 34.3 µg/m³ (17.45 hrs).
- c. At Store yard CAAQM station (West side to the Industry)
 - PM₁₀ values increased from 365 µg/m³ (14.00 hrs) to 511 µg/m³ (15.00 hrs) and reduced to 225 µg/m³ (17.00 hrs).
 - PM_{2.5} values increased from 73 µg/m³ (14.00 hrs) to 99 µg/m³ (15.00 hrs) and reduced to 53 µg/m³ (17.00 hrs).
 - NO_x values recorded 26.77 µg/m³ (13.15 hrs) and increased to 35.49 µg/m³ (17.30 hrs).

The copy of the monitoring reports are enclosed at Annexure-3.

Mobile lab of APPCB was also stationed in the down wind direction to record various parameters in the ambient air continuously. The copy of the monitoring reports are enclosed at Annexure-4.

Contaminated wastewater was generated due to fire fighting. Sea cooling water is used in the fire water network of HPCL-Visakh Refinery and the fire water used for fire-fighting operations collected in surface drains of CDU-3 is routed to Effluent Treatment Plant for treatment along with the other wastewaters. Water samples were collected during fire fighting operations from the drain were analysed and from the data it was observed that the TSS values are ranging from 820 mg/l to 1160 mg/l, COD values are

ranging from 156 mg/l to 184 mg/l, Oil & Grease values are ranging from 8 mg/l to 14 mg/l. The copy of the analysis report is enclosed at annexure-5.

The industry was directed to dispose the oily sludge generated in CDU-3 during fire incident to authorized agencies/ Treatment Storage Disposal Facility (TSDF) for safe disposal. The industry has informed that the oily sludge generated will be mechanically treated for oil recovery and the recovered oil pumped to slop tanks for processing along with crude oil. The residual low oily sludge will be bio-remediated within the industry.

As per the information given by HPCL, about 25 Cr. worth of works have to be undertaken immediately to replace the damaged pipelines and machinery in CDU-III and about 78 MT of hydrocarbon was burnt in this fire incident.

The Collector & District Magistrate, Visakhapatnam has constituted a committee on 25.05.2021 and the copy of proceedings issued by the Collector & District Magistrate, Visakhapatnam is herewith enclosed as annexure-6.

The committee visited the place of incident on 28.05.2021 and physically seen the burnt pipelines and adjoining areas which were badly damaged due to the engulfing of fire. Based on the inspection of committee members, interaction with the HPCL officials and statements collected from the eye witness, the cause of the outbreak of the fire is preliminarily identified that the 6" SR pipeline carrying bituminous at a temperature of 355°C to 400°C and an operating pressure of 16 kg/cm² has developed a hole of about 2.5" to 3" may be due to corrosion or erosion. The technical reasons for the corrosion or erosion are to be ascertained after conducting a detailed study on MOC (Material of Construction) of the pipeline. The bituminous with such higher temperature has escaped from the hole developed in the pipeline and due to auto ignition temperature (280°C for bituminous), it has released lot of smoke and subsequent fire with loud cracking sound. As the projectile of the fire is vertical, the pipelines passing at an height of 30 mts from the ground level got ruptured at six places and contributed more hydrocarbons to the engulfed fire. The type of the fire can be envisaged as Jet Fire followed by Pool Fire.

The committee also observed that as per the air pollution monitoring reports from three CAAQM stations operating by M/s.HPCL shows higher values of PM_{2.5} and PM₁₀ during the fire incident which indicates the considerable extent of air pollution within the plant premises. Due to continuous fire of about 65 minutes, might have increased the ambient temperatures to some extent and incremental adverse impact on various meteorological parameters.

The copy of the detailed report submitted by the Committee to the District Collector is herewith enclosed at annexure-7.

The report is filed for kind consideration.

Date: 17.06.2021


Environmental Engineer
A.P. Pollution Control Board
Regional Office, Visakhapatnam

5. The Joint Committee further filed a report dated 26.05.2021, e-filed and received today with annexure which reads as follows:

**REPORT OF THE JOINT COMMITTEE IN THE MATTER OF O A. NO. 73/2021
TITLED: VISAKHA PAWAN PRAJA KARMIKA SANGHAM Vs UNION OF INDIA
AND OTHERS, SUBMITTED TO HON'BLE NATIONAL GREEN TRIBUNAL,
SOUTHERN ZONE, CHENNAI IN COMPLIANCE TO HON'BLE NGT ORDER
DATED FEBRUARY 25, 2021**

1.0 Preamble:

The Hon'ble National Green Tribunal (NGT), Southern Zone, Chennai in the matter of O. A. No. 73 of 2021 has passed an order dated February 25, 2021 and the operative portion of the order is reproduced as under and the copy of the Hon'ble NGT order is annexed as **Annexure - 1**:

"11... In order to ascertain the genuineness of the allegations made in the application and its impact and the remedial measures if any to be taken, we feel it appropriate to appoint a Joint Committee comprising of (1) a Senior Officer from Ministry of Environment, Forests and Climate Change (MoEF & CC) Integrated, Regional Office, Chennai, (2) a Senior Scientist from Central Pollution Control Board (CPCB), Regional Office, Chennai, (3) a Senior Scientist having some experience in Petroleum Pollution from Andhra Pradesh State Pollution Control Board (APPCB) and (4) a Scientist having experience in Petro-Chemical activities from Indian Institute of Chemical Technology (IICT) under the Council of Scientific & Industrial Research (CSIR), Hyderabad to inspect the unit in question and submit a factual as well as action taken report, if there is any violation found....."

2.0 Constitution of the Joint Committee:

In compliance with the order dated February 25, 2021; as a nodal agency, Andhra Pradesh Pollution Control Board (APPCB), based on the nominations received from the concerned organizations, constituted a Joint Committee on March 20, 2021 comprising the following members:

- i. Dr. Suresh Babu Pasupuleti, Scientist-C, Ministry of Environment, Forest and Climate Change, Integrated Regional Office (IRO), Vijayawada.
- ii. Smt. Poornima B M, Scientist D, Central Pollution Control Board, Regional Directorate – Chennai.
- iii. Dr. B.V. Prasad, Senior Environmental Scientist, APPCB, Vijayawada.
- iv. Dr. N. Lingaiah, Sr. Principal Scientist, Catalysis & Fine Chemicals Division, CSIR-IICT, Hyderabad.

The Joint Committee had its first meeting on March 22, 2021 through video conference (VC) and discussed Terms of Reference (ToR) to proceed further over the case. The committee finalized the dates for the site visit during March 25-27, 2021.

2.1 Terms of Reference (ToR) of the Joint Committee:

As per the Hon'ble NGT order dated February 25, 2021; the committee is entrusted to visit and inspect the site in question and following ToR:

- a. To inspect the unit in question and submit a factual as well as action taken report, if there is any violation found.
- b. To ascertain whether there is any violations of environmental clearance, consent conditions and safety measures provided are sufficient to meet the pollution that is likely to be caused on account of the operating of the unit.
- c. To verify the compliance to the recommendations made by the Indian Institute of Science in 2016 which was directed to be implemented by the Andhra Pradesh State Pollution Control Board (APPCB) during 2016.
- d. To assess environmental compensation if any violation found causing environmental degradation.
- e. To provide the remedial measures for the purpose of mitigating the situation and improve the condition of air quality in that area.
- f. To ascertain the source of pollution and the remedial measures to mitigate the same.

2.2 Site visit by the Joint Committee:

The committee as decided in its first meeting visited the unit M/s. Hindustan Petroleum Corporation Limited (HPCL), Malkapuram, Visakhapatnam, Andhra Pradesh known as Visakha Refinery during March 25-27, 2021. Sh. A. Tirupathi Naidu, GM (I/C), Sri Bhagavan, Deputy General Manager, Sh. Shaik Sardar, Senior Manager Environment and other Technical & Environment Department officials representing the refinery were present during the time of inspection. The committee inspected the unit and verified the compliance status of Environmental Clearance (EC), Consent conditions of both Air & Water, Conditions of Hazardous waste authorization and the directions issued by APPCB. The committee monitored the source emissions & ambient air quality in and around the refinery and collected samples from the Effluent Treatment Plants (ETP) and Sewage Treatment Plant (STP).

3.0 About M/s. Hindustan Petroleum Corporation Limited (HPCL), Malkapuram, Visakhapatnam, AP:

3.1 General Information: M/s Hindustan Petroleum Corporation Limited was commissioned in the year 1957 with an installed capacity of 0.65 Million Metric Tons per Annum (MMTPA) by Caltex Oil Refining (India) Ltd. In the year, 1976 Govt. of India taken over the refinery and subsequently merged with HPCL in 1978. HPCL increased the production capacity phase wise from 0.65 MMTPA to 8.3 MMTPA by installing various types of process units to manufacture various products. The total area of the industry is 723 acres, and is located at 17^o14'41.51" N; 83^o14'54.42" E at an elevation of 5.5m. The unit has 1194 permanent employees and 3500 contract workers.

The unit is surrounded by

North: M/s. Andhra Petro Chemicals Limited.

South: 80 Ft. Road (Scindia to Gajuwaka), Sriharipuram, Malkapuram

East: M/s. IOCL Terminal

West: M/s. Coromandel Fertilizer Ltd., M/s. HZL, M/s. Alufluoride etc.

3.2 Statutory Requirements:

The Environmental Clearances (EC), Consents for Establishment (CFE) and Consents for Operation (CFO) obtained from the Ministry of Environment, Forests & Climate Change, Govt. of India and Andhra Pradesh Pollution Control Board (APPCB) are as follows:

S. No.	EC / CFE / CFO	Capacity (MMTPA)	Order No., dated
1	MoEF & CC EC	4.5 to 7.5	J-11011/22/94-A II (I), dated 30.05.1995 (Annexure – 2)
2		Installation of Diesel Hydro-desulphurization	J-11011/88/96-IA-II(I), dated 10.04.1997 (Annexure – 3)
3		7.5 to 10.0	Lr. No. J-11013/55/2003-1A II (I), 03.02.2004 (Annexure – 4)
4		Mounded storage for Propylene/LPG	J-11011/66/2007-IA II (I), dated 07.03.2008 (Annexure – 5)
5		Expansion from 7.5 to 10.0 MMTPA	J-11011/408/2009-IA-II(I), dated 02.09.2009 (Annexure – 6)
6		8.33 to 15.0	F-No. J-11011/63/2013-IA II (I), 11.02.2016 (Annexure – 7)
7	APPCB CFE	10.0 to 15.0	Order No. 72/APPCB/CFE/RO-VSP/HO/2006, dated 06.07.2016 (Annexure – 8)
8	APPCB CFO & Hazardous waste authorization	10.0 & 121.20 MW captive power plant	Order No. APPCB/VSP/VSP/72/CFO/HO/2016, 24.03.2016 (Annexure – 9)
9		10.0 & 121.20 MW captive power plant	Order No. APPCB/VSP/VSP/72/CFO/HO/2019, 18.12.2019 (Annexure – 10)
10		10.0 & 121.20 MW captive power plant	Order No. APPCB/VSP/VSP/72/CFO/HO/2021, 09.03.2021 (Annexure – 11)
MMTPA: Million Metric Tons Per Annum.			

After obtaining the EC dated 10.02.2016 from MoEF & CC for expansion upto 15 MMTPA, M/s. HPCL applied consent for establishment (CFE) to APPCB for Expansion on June 11, 2016 & June 21, 2016. APPCB issued CFE on July 6, 2016 valid up to seven years from the date of issue of CFE. During the committee inspection, the construction works for expansion project are under progress.

3.3 Process Description:

The series of processes by which products are manufactured from crude oil is collectively known as refining. Crude oil is a mixture of different hydrocarbon compounds and a source of various products like LPG, Naphtha, Gasoline, ATF/SKO, Diesel, Fuel Oil/LSHS and other petroleum speciality products. HPCL sources crude oil containing both high & low sulphur from indigenous

sources viz., Ravva, Mumbai High etc., and imported crude from Middle –East, African countries etc. Crude oil from the tankers is received at the Off-Shore Tanker Terminal (OSTT) and transported to the Visakha Refinery through 9.2 Km underground pipeline. The crude oil is stored in the 12 large tanks.

HPCL has three Crude Distillation Units namely CDU-I, II & III, the secondary units of two Fluid Catalytic Cracking Units, one Vis Breaking Unit (VBU), and one Bitumen Blowing unit (BBU). Product Quality Treating Units like Diesel Hydro Desulphurization unit (DHDS), Hydrogen Generation unit (GHU), Sulphur Recovery unit (SRU), Merox Units (LPG, CRN, ATF), LPG Amine Treating unit & Propylene Recovery Unit (PRU), Fluid Catalytic Cracking Unit (FCCU), Naphtha Hydro Treating Unit (NHTU- (Prime G+) Continuous Catalytic Reforming Unit (CCRU) and Naphtha Isomerizing Unit (NIU).

Crude oil is first subjected to physical separation into various components in crude distillation unit (CDU) by employing a process called fractional distillation. In CDU, the crude is preheated in a battery of heat exchangers utilizing the heat of the various streams from the distillation columns and finally heated in a furnace to a temperature required for effective separation. It is fed to a distillation column wherein it is separated to various streams, viz., Un-stabilized Naphtha, Heavy Naphtha, Kerosene, Straight Run Diesel and Reduced Crude Oil. Un-stabilized Naphtha is further separated in another distillation column called Stabilizer into Liquefied Petroleum Gas (LPG) and Straight Run Naphtha.

The Reduced Crude Oil is subjected to further separation under vacuum conditions in another distillation column. There, it gets separated to Vacuum Diesel, Vacuum Gas Oil and Short Residue. The Short Residue from this column goes for production of either Bitumen or Fuel Oil. The Vacuum Gas Oil from crude distillation unit is further processed in a Fluidized Catalytic Cracking Unit (FCCU) wherein it is converted to value added streams in the presence of a circulating catalyst. The streams that are so generated are Liquefied Petroleum Gas (LPG), Cracked Run Naphtha, Cycle Oils and residue. Clarified oil from FCCUs is also routed to Fuel oil pool for FO production.

LPG from CDUs and FCCUs is treated in Amine Treatment Unit / Merox Unit for removal of Hydrogen Sulphide and Mercaptans. Propylene (> 95% Purity) is recovered from Cracked LPG in Propylene Recovery Unit (PRU).

The Straight Run Naphtha & Cracked Run Naphtha are routed to MS block (NHT/CCR/NIU/FCCNHT) for Desulphurizing / Reforming / Isomerization, thus producing Motor Spirit (Petrol) meeting required statutory specifications. Excess Naphtha if any that could not be converted to Motor Spirit is sold as Naphtha Product.

Table 1: Products produced during the year 2020

S. No.	Product	Permitted quantity as per CFO Order dated 09.03.2021 in TPA	Products Produced during 2020 (Jan. to Dec.) in TPA
1	Propylene	36,000	46,000
2	LPG	6,43,000	4,18,000
3	Naphtha	1,73,000	3,68,700
4	Motor spirit	16,55,000	16,72,900
5	ATF	1,20,000	59,100
6	SKO	5,21,330	1,42,200
7	Diesel	37,86,670	39,31,500
8	FO 3.5 % S	16,62,000	9,36,100
9	FO 1.0% S	2,37,670	1,68,500
10	Bitumen	2,20,660	5,15,400
11	Sulphur	56,370	34,800
12	Refinery Fuel	7,41,670	7,27,300
13	Intermediate Stream Build up	--	50,500
Total:		1,00,00,000	90,71,100
Crude processed during the year, 2020 (January to December)			90,71,100

From the above table, it is observed that the quantities of crude oil processed and the sum of various products produced during the year 2020 is same. This shows that the entire crude oil is converted into useful petroleum products without any loss or leaving any hydrocarbon fraction into the atmosphere, which is practically impossible in any refinery. There will always be good amount of non-recoverable volatile aromatic and aliphatic hydrocarbons emanated during crude processing, which will be vented through flare stacks and subjected to continuous burning throughout the year. The crude will also be having measurable concentrations of water soluble salts, which are removed through water treatment before subjected to distillation.

4.0 Compliance status of Environmental Clearance conditions

The detailed compliance status of conditions stipulated in the environmental clearance letter no. J-11011/22/94-A II (I) dated 30.05.1995, J-11011/88/96- IA II (I) dated 10.04. 1997, J-11013/55/2003-IA II (I) dated 03.02.2004, J-11011/66/2007-1A II (I) dated 07.03.2008, J-11011/408/2009-IA II (I) dated 02.09.2009 and J-11011/63/2013-IA II (I) dated 11.02.2016 along with non-compliances observed are enclosed (Annexure - 12).

4.1 Compliance status of consent conditions issued by APPCB

APPCB renewed combined consent for operation on March 9, 2021 under Water Act, 1974 and Air Act, 1981 and Authorisation under Hazardous & Other Wastes Rules, 2016 up to December 31, 2025. In compliance to Hon'ble NGT order dated February 25, 2021; the committee verified the compliance of the consent conditions. The compliance status of CFO conditions is enclosed (Annexure – 13).

4.2 Compliance status of the recommendations made by the Indian Institute of Science, Bengaluru:

APPCB and District Administration received many public complaints of odour problems from several parts of the Visakhapatnam city during October–November, 2011. APPCB and District Administration of Visakhapatnam engaged Indian Institute of Science (IISc), Bengaluru in the year 2012 to carry out the study for identifying the root cause for odour nuisance in Visakhapatnam city. IISc, Bengaluru carried out the study and submitted the report along with the recommendations in the year 2016. The major observation of the IISc is that the compounds responsible for the odour problem in Visakhapatnam City, particularly Malkapuram, Gajuvaka, Gopalapuram, etc., residential areas could be the cumulative effect of odorous organic and inorganic like, unburnt hydrocarbons, BTX solvents, Sulphides (Hydrogen Sulphide, Mercaptans, Mono & Di methyl sulphides), Amino compounds, etc. from the industrial establishment, domestic sewage, municipal solid waste and vehicular exhausts, and hence, it is difficult to pin point any individual industry.

The important task in mitigating the pollution from the industries is to maintain stack emissions within the stipulated limits. As far as the HPCL Refinery is concerned, the scrubbers of FGDS in FCCU-I & II shall be maintained at its best operating condition.

The recommendations made by the IISc, Bengaluru are:

- i. Even if industries follow good practices and maintain emission within the limits, there are possibilities of episodic odour issues. In such cases, it is the responsibility of each and every industry in the region towards community to cooperate and participate in taking the odour problem in Visakhapatnam area.
- ii. APPCB being the nodal agency, should form an odour squad comprising members from APPCB, each stakeholder industry, prominent community members and experts in environmental field. The task of the squad should include:
 - In case of any episode, the APPCB nominee to inform all members about the compliant and location.
 - The squad to visit the site and take ambient air samples in Tedler bags which should be stored under appropriate conditions and transported immediately (for GC-MC analysis) to recognized laboratory.
 - Upon receiving the complaints from the squad, each industry should check for abnormal emissions or operating conditions if any, in their industry and report to APPCB and take necessary actions.
- iii. APPCB should initiate a community medical study to correlate the mortality rate before and after the odour episode for compare the data during non-episodal to evaluate the hazard.
- iv. Use of respiratory masks must be encouraged whenever odour is experienced.
- v. Public education is an important concept in odour management. The odour squad should strive to impress upon people of Visakhapatnam that the common odour one might smell from the industries or any other sources will not have serious impact on average person's health if released in small amounts. It is important to maintain public decorum and take steps to mitigate the panic among the general public through proper education.

4.3 Compliance status of the directions issued by APPCB dated March 19, 2020:

Based on the recommendations made by IISC, Bengaluru report in 2016; APPCB did not issue any directions to HPCL as there were no specific directions to HPCL. APPCB inspected the industry on February 25, 2020 and based on the observations, legal hearing was conducted before the External Advisory Committee (Task Force) on March 4, 2020. The representative of the industry attended the legal hearing and submitted their views. The committee after detailed discussions issued the directions on March 19, 2020. The copy of the directions issued by APPCB on March 19, 2020 is attached as *Annexure - 14*. During inspection, the committee verified the compliance status of the directions and is enclosed (Annexure - 15).

5.0 Monitoring of ambient air quality and stack emission in HPCL:

To ascertain the source of pollution, committee along with scientist of APPCB, Zonal Laboratory carried out ambient air quality monitoring at 5 locations (Manual monitoring at 3 locations & Mobile van with CAAQMS at 2 locations) in and around the industry premises.

Table 4: Details of ambient air quality monitoring locations

S. No.	Location	Latitude	Longitude	Date of monitoring	Parameters
I Manual Stations					
1	North-east side of the industry (near industry CAAQM stations at HLPH)	17.696921	83.251094	25.03.2021 and 26.03.2021	PM 10, PM 2.5, SO ₂ , NO ₂ & NH ₃ .
2	South-west to industry (Yarada park housing colony – S10 building)	17.688231	83.240756		
3	South-east side of the industry (near industry CAAQM station)	17.688419	83.250038		
II Mobile Continuous Ambient Air Quality Monitoring Station (CAAQMS)					
1	North-west corner of the industry near ETP – 4	17.700329	83.237126	25.03.2021 and 26.03.2021	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , NH ₃ , O ₃ , CO, Benzene and VOCs.
2	South-east side of the industry (near industry CAAQM station)	17.688419	83.250038	26.03.2021 and 27.03.2021	

The parameters monitored are PM₁₀, PM_{2.5}, SO₂, NO₂, NH₃, O₃, CO, Benzene and VOCs between 25.03.2021 and 27.03.2021. The monitoring results are depicted in table 5 below:

Table 5: Ambient air quality monitoring results

S. No.	Location	PM ₁₀	PM _{2.5}	SO ₂	NO _x	NH ₃	O ₃	CO	Benzene
I Manual Stations									
1	North-east side of the industry (near industry CAAQM stations at HLPH)	267	92	44	33	29	-	-	-
2	South-west to industry (Yarada park housing colony – S10 building)	115	69	19	17	27	-	-	-
3	South-east side of the industry (near industry CAAQM station)	248	83	48	36	30	-	-	-
II Mobile Continuous Ambient Air Quality Monitoring Station (CAAQMS)									
1	North-west corner of the industry near ETP – 4	320	89	84	39	40	57.7	1.4	2.7
2	South-east side of the industry (near industry CAAQM station)	298	94	52	42	35	66.2	1.7	3.3
24 Hour average standard		100	60	80	80	400	100 (8 hour s)	4 (1 hour)	-
Annual average standard		60	40	50	40	100	180 (1 hour)	2 (8 hour s)	5
All values are expressed in $\mu\text{g}/\text{m}^3$, except CO. CO values are expressed in mg/m^3 .									
Analysis result of other 49 VOCs is annexed (Annexure – 16).									

The results show that the values of PM₁₀ & PM_{2.5} values are exceeding the 24 hour average standards. The SO₂ value at the North-west corner of the industry near ETP – 4 is exceeding the standard. The values of SO₂ & NO_x, though not exceeding the standard limits found far higher than the values obtained at the locations elsewhere in Visakhapatnam city. This indicates that there are leaks in the process systems through which, PM₁₀, PM_{2.5}, SO₂, NO_x, etc. are find their way into the ambient air as fugitive emissions. Higher values of PM₁₀ & PM_{2.5} in the ambient air could also be attributed due to the expansion works going on within the premises of the refinery.

M/s. HPCL Refinery has installed three CAAQM stations within the periphery of the industry for continuously monitoring the ambient air quality on real-time basis. The data from these stations is transferred to APPCB & CPCB servers. Data pertaining to the monitoring for the period from January, 2020 to March, 2021 is enclosed (*Annexure – 17*). From the results it is observed that the value of PM₁₀ and PM_{2.5} are exceeding the standard. During February 15 to March 15, 2021 in the CAAQMS station at the southern side of the industry, there is a spike in the SO₂ value.

The Joint Committee requested Zonal Laboratory, APPCB, Visakhapatnam to carry out ambient air quality monitoring using mobile CAAQM Station for three days during May 3-6, 2021 and 06.05.2021 in the residential area of Malkapuram at Ajanta colony which lies south-east

direction of M/s. HPCL Refinery to verify the impact of emissions from the refinery. The results obtained are tabulated as below:

Table 6: results of the ambient air quality monitored at Malkapuram in Ajanta colony

S. No.	Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Benzene
1	03.05.2021 to 04.05.2021	91	25	33	25	16	41.2	0.9	1.5
2	04.05.2021 to 05.05.2021	72	17	25	22	15	29.7	1.0	0.6
3	05.05.2021 to 06.05.2021	67	16	37	24	23	55.1	0.9	0.7
24 Hour average standard		100	60	80	80	400	100 (8 hours)	4 (1 hour)	-
Annual average standard		60	40	50	40	100	180 (1 hour)	2 (8 hours)	5
All values are expressed in $\mu\text{g}/\text{m}^3$, except CO. CO values are expressed in mg/m^3 .									
Analysis result of other 49 VOCs is enclosed (Annexure – 16).									

From the table above, it is observed that the all the parameters are well within the standards for all the three days.

5.1 Monitoring of emission in stacks

Committee carried out monitoring of flue gas emissions from five important stacks for PM, SO₂ and NO_x during the period of inspection during March 25-27, 2021. Details of stacks monitored and the results are tabulated below:

Table 7: Analysis results of stacks monitored

S. No.	Stack identity	Date of monitoring	Parameter	Value (mg/NM ³)	Standard
1	Stack attached to DHDS Reformer-61F11	25.03.2021	PM	39.0	100
			SO ₂	63.5	--
			NO _x	35.7	--
2	Stack attached to combined feed heater and product fractionators reboilers-90F01, 90F02	26.03.2021	PM	24.9	100
			SO ₂	184.7	--
			NO _x	204.9	--
3	Stack attached to Flue gas desulphurization unit FGD-II	26.03.2021	PM	36.0	50
			SO ₂	147.5	--
			NO _x	112.8	--
4	Stack attached to continuous catalytic reforming unit (CCR) 74F1, F2, F3, F4	26.03.2021	PM	22.0	100
			SO ₂	25.1	--
			NO _x	117.4	--
5	Stack attached SRU Train – III Incinerator 79F302	27.03.2021	PM	23.0	100
			SO ₂	32.5	--
			NO _x	35.7	--
Analysis reports enclosed (Annexure -18).					

From the results, all the parameters are meeting the prescribed standard by APPCB for all the five stacks monitored.

The Visakha Refinery has installed Online Continuous Emission Monitoring Systems (OCEMS) to 32 stacks to monitor the flue gas emissions for Particulate Matter (PM), Sulfur dioxide (SO₂), Nitrogen dioxide (NO₂) and Carbon monoxide (CO) on real-time basis and connected to APPCB & CPCB server. Analysis data obtained from these stacks for the period from 01.01.2020 to 30.04.2021 has been collected and enclosed (Annexure – 18). There are few exceedances noticed during March, 2021

According to the CFO conditions issued by APPCB has prescribed stipulated standards for pollutant emission loads from the stacks for PM, SO₂, NO_x & hydrocarbons. The Joint Committee calculated pollutant emission load for compliance verification as tabulated below.

Table 8: Emission Load calculation statement for PM, SO₂ and NO_x as per the data obtained from the CEMS connected to stacks - From 01.01.2020 to 30.04.2021

S. No.	Stack ID		SPM (TPD)	NO _x (TPD)	SO ₂ (TPD)
	S. No. as per CFO order	As per CEMS	Actual as per CEMS	Actual as per CEMS	Actual as per CEMS
1	Stack 4	Stack 01 CDU I 2F1	0.028	0.058	0.283
2	Stack 6	Stack02 CDU I 2F2-	0.008	0.043	0.182
3	Stack 5	Stack03 CDU I 2F4-	0.016	0.055	0.275
4	Stack 1	Stack04 CDU II 11F1-	0.068	0.173	0.543
5	Stack 2	Stack05 CDU II 12F1-	0.015	0.066	0.166
6	Stack 12	Stack06 CDU III 42F1-	0.057	0.133	0.552
7	Stack 13	Stack07 CDU III 42F2-	0.01	0.04	0.15
8	Stack 14	Stack08 VBU 46F1-	0.006	0.062	0.137
9	Stack 15	Stack09 FCCU I 4F51-	0.015	0.02	0.116
10	Stack 16	Stack10 FCCU I 4F52-	0.094	0.045	0.146
11	Stack 35	Stack11 FCCU I FGD1-	0.063	0.42	0.184
12	Stack 3	Stack12 FCCU II 14F1-	0.012	0.023	0.139
13	Stack 9	Stack13 FCCU II 14F3-	NA	0.029	0.093
14	Stack 34	Stack14 FCCU II FGD2-	0.111	0.31	0.098
15	Stack 8	Stack15 PP I WIL8-	NA	NA	NA
16	Stack 27	Stack16 PP I IBH-	0.01	0.203	0.273
17	Stack 21	Stack17 DHDS 60F1-	0.002	0.045	0.108
18	Stack 19	Stack 18 DHDS REFORMER-	NA	0.042	0.054
19	Stack 20	Stack19 DHDS HGU 61F1	NA	NA	NA
20	Stack 22	Stack20 DHDS SRU 65F001-	NA	0.02	0.042
21	Stack 26	Stack21 DHDS SRU 79F302-	NA	0.008	0.176
22	Stack 24	Stack22 CCR 74 F1toF4-	0.021	0.135	0.042
23	Stack 23	Stack23 NHT 72 F1F2-	0.003	0.017	0.02
24	Stack 25	Stack24 FCCNHT 75F1-	0.001	0.004	0.006
25	Stack 17	Stack25 CPP HRSGIII-	0.083	0.978	0.047
26	Stack 18	Stack26 CPP HRSGIV-	0.103	0.575	0.06
27	Stack 28	Stack27 CPP HRSGV-	0.058	0.648	0.192
28	Stack 29	Stack28 CPP HRSGVI-	0.064	0.74	0.176
29	Stack 30	Stack 29 DHT FEED 90F01 02-	0.054	0.092	0.138
30	Stack 32	Stack 30 DHT HGU NAPHTHA_H EATER 91F01-	0	0.002	0.001
31	Stack 31	Stack 31 DHT HGU 91M20-	0.063	0.079	0.071
32	Stack 33	Stack 32 DHT SRU 92M22-	0.004	0.018	0.051
Total (as calculated from the results obtained from			0.969	5.083	4.521

CEMS connected to 32 stacks)			
Total emission load (as stipulated to each stack in the CFO Order against the 32 stacks)	5.609	---	---
Total emission load (as stipulated to each stack in the CFO Order against all the 36 stacks)	6.72	---	---
Total emission load prescribed as per CFO Order	1.11	6.5	11.5
Stack monitoring data obtained from the Continuous Emission Monitoring Systems (CEMS) connected to 32 stacks for the period from 01.01.2020 to 30.04.2021. (Annexure – 19).			

From the above calculations, the parameters PM, SO₂ and NO₂ are meeting the prescribed standard for pollution emission loads.

5.2 Water consumption and wastewater generation & treatment details

Domestic and process & washings requirements of the refinery are met from the Greater Visakhapatnam Municipal Corporation supply. Cooling water requirements are met from the water drawn from sea. The refinery has provided the data of water consumption & wastewater generation during the year 2020 (January to December) and treatment facilities available to the Joint Committee during inspection. Details are tabulated below:

Table 9: Water consumption details

S. No.	Purpose	Permitted quantity as per the CFO order dated 18.12.2019 (KLD)	Actual consumption (KLD)
1	Process & washings	10,176	9,250
2	Boiler feed	1,680	7,718
3	Industrial cooling (make up) / humidification / water spraying	5,03,305	2,13,035
4	Industrial water	6,900	---
5	Domestic	732	732
Total:		5,22,793	2,30,735
Remarks: Water consumption for boiler feed was exceeded the permitted quantity.			

a. Waste water generation and treatment:

Wastewater is generated mostly during desalting of crude oil (striped Water), spent caustic solutions, floor washings, crude & product tank washings, boiler blow downs, etc.

Table 10: Wastewater generation

S. No.	Outlet description	Max. daily discharge as per CFO order dated 18.12.2019 (KLD)	Point of disposal	Actual quantity of wastewater discharge during the year 2020 (KLD)
1	Process & Washings	11,820	Shall be discharged into Meghadrigedda surplus course joining Bay of Bengal sea after	5,272

			treatment in ETPs – I, II & IV.	
2	Cooling blow down	2,18,286	Shall be discharged into Meghadrigedda surplus overflow channel through two numbers of Main Hay Filters, which finally joins the sea Bay of Bengal after treatment	2,18,286
3	Domestic effluents	636	Shall be used for onland for irrigation within the industry premises after treatment in STP.	636
Total:		2,30,742	—	2,24,194

There are three effluent treatment plants in HPCL. The status of operation and its operating capacities are as below:

Table 11: ETP status details

Name of ETP	Designed Capacity, (KL/hr)	Inlet Sources to ETP	Status of Operation	Treatment units
ETP-I	135 KL/Hour (3,240 KLD)	CDUs, FCC-I, QC & Product tank	In Operation.	API, TPIs for free oil removal, dissolved air floatation, flocculation tank, equalisation tank, aeration tank & dual media filters (carbon & sand).
ETP-II	325 KL/Hour (7,800 KLD)	Desalter, Oily water & spent caustic effluents	Partially operation and routed to ETP-IV for further treatment.	API, TPIs for free oil removal, neutralisation tank, ammonia stripper, dissolved air floatation tank, equalization tank, two-stage biological treatment, dual media & activated carbon filters.
ETP-IV	180 KL/Hour (4,320 KLD)	Effluents from MS block	In Operation.	API, TPIs, flash mixing tanks, flocculation tank, dissolved air floatation tank, sequential batch reactor for removal of organics, dual media filters, activated carbon filters followed by disinfection through bromination.

Treated effluent along with the ones-through cooling water is discharged into Megadrigedda surplus overflow channel through two numbers of Main Hay Filters, which finally joins the sea Bay of Bengal.

During inspection, Joint Committee collected treated effluents from three outlets of Effluent Treatment Plants and the two final outlets discharged into Megadrigedda surplus overflow

channel for compliance verification on March 26, 2021. The samples collected were analyzed in the Zonal Laboratory, APPCB, Visakhapatnam. Details of samples collected and analysis results are tabulated below:

Table 12: Analysis results of Final outlet

S. No.	Parameters	MHF-II outlet (E-332)	MHF-I outlet (E-333)	CFO Order stipulated standards
1	pH	7.16	7.28	6.50 – 8.50
2	Oil & grease	< 1.0	< 1.0	1.0
3	Hexavalent chromium (as Cr)	0.01	BDL	0.10
All values are expressed in mg/L except pH.				

Table 13: Analysis results of ETPs outlet

S. No.	Parameter	ETP – I – DMF outlet (E-334)	ETP – IV ACF outlet (E-335)	CFO Order stipulated standards
1	pH	7.64	8.33	6.5-8.5
2	Total Suspended Solids at 105 ⁰ C	23	57	20
3	Chemical Oxygen Demand	44	96	125
4	Biochemical Oxygen Demand	10.5	23.0	15
5	Oil & Grease	<1	2.0	5.0
6	Sulphides (as S ²⁻)	1.6	2.4	0.5
7	Ammonical Nitrogen (as NH ₃ -N)	3.9	26.3	15.0
8	Phenols (as C ₆ H ₅ OH)	BDL	0.02	0.35
9	Phosphates (as P)	0.08	0.07	3.0
10	Hexavalent Chromium (as Cr ⁶⁺)	BDL	BDL	0.10
11	Total Chromium (as Cr)	0.0007	0.0010	2.0
12	Lead (as Pb)	0.0002	<0.0001	0.10
13	Zinc (as Zn)	0.0090	0.0080	5.0
14	Nickel (Ni)	0.0083	0.0024	1.0
15	Copper (as Cu)	0.0025	0.0007	1.0
16	Cyanide (as CN ⁻)	BDL	BDL	0.2
All values are expressed in mg/l except pH.				
Analysis reports enclosed (Annexure – 20).				

From the analysis results, it is observed that the values of Total Suspended Solids, Biochemical Oxygen Demand and Ammonical Nitrogen are exceeding the stipulated standards for the sample collected from ETP – IV (ACF outlet) and TSS value in ETP I outlet.

APPCB in the CFO Order, stipulated standards have been prescribed for pollution loads of various effluents parameters to comply with while discharging the treated effluents outside the premises. Accordingly, the Joint Committee made pollution load calculations as tabulated below for compliance verification. As per the calculation, the pollution load of all the parameters are meeting the stipulated standard prescribed by APPCB.

Table 14: Pollution load calculation for effluent

S. No.	Pollutant	ETP / STP	Value (mg/lit)	Quantity of treated effluent (KLD)	Pollutant load (TPD)	
1	TSS	ETP – I – DMF outlet	23	5,272	0.42	
		ETP – IV ACF outlet	57			
		STP outlet	14	636	0.009	
	Total					0.429
	Standard as per CFO order					1.25
2	COD	ETP – I – DMF outlet	44	5,272	0.74	
		ETP – IV ACF outlet	96			
		STP outlet	72	636	0.046	
	Total					0.786
	Standard as per CFO order					17.2
3	BOD	ETP – I – DMF outlet	10.5	5,272	0.18	
		ETP – IV ACF outlet	23			
		STP outlet	18	636	0.011	
	Total					0.191
	Standard as per CFO order					4.6
4	Phenol	ETP – I – DMF outlet	BDL	5,272	0.00011	
		ETP – IV ACF outlet	0.02			
		STP outlet	---	636	---	
	Total					0.00011
	Standard as per CFO order					0.67
5	Sulphide	ETP – I – DMF outlet	1.6	5,272	0.021	
		ETP – IV ACF outlet	2.4			
		STP outlet	---	636	---	
	Total					0.021
	Standard as per CFO order					1.66
6	Oil & Grease	ETP – I – DMF outlet	0.9	2,23,558 (Treated effluent: 5,272 + Cooling blow down: 2,18,286)	0.20	
		ETP – IV ACF outlet				
		MHF-II outlet				
		MHF-I outlet				
	Total					0.20
Standard as per CFO order					12.26	

b. Domestic wastewater treatment details

HPCL has two STPs of 40 KLD capacity (25 & 15 KLD) to treat the sewage generated from the administration block. The wastewater is generated from rest rooms, kitchen and dining area. About 25-30 KLD of sewage is generated and is treated in the STP with Wetland Technology treatment system and the treated water is utilized for on land gardening. During inspection, the STP was monitored and collected samples from the outlet of STP and the results are depicted in the table below:

Table 15: Analysis results of treated domestic effluent

S. No.	Parameter	STP outlet Mg/L except pH	Standard prescribed by APPCB as in CFO
1	pH	8.40	6.5-8.5
2	Total Suspended Solids at 105 ⁰ C	14	100 mg/l
3	Total Dissolved Solids at 105 ⁰ C	820	----
4	Chemical Oxygen Demand	72	----
5	Biochemical Oxygen Demand	18	30 mg/l

From the analysis results, it is observed that all the parameters are meeting the standards.

6. Ground water quality monitoring:

HPCL has installed six piezometer wells inside the unit premises to regularly monitor the ground water quality. During the inspection, it was informed to the committee that four of the wells are dried up and the Joint Committee collected ground water samples from two piezometer wells located within the industry premises. The analysis results of the ground water are detailed below:

Table 16: Analysis results of bore well water samples collected within the premises of the refinery

S. No.	Parameter	Borewell near substation 8A	Borewell near tank 10A	Drinking Water Specifications: IS:10500:2012
				Requirement (Acceptable Limit)
1	pH	7.81	8.03	6.5-8.5
2	Conductivity (as μS/cm)	10190	4400	----
3	Total Dissolved Solids at 105 ⁰ C	7184	2772	500
4	Total Organic Carbon (as TOC)	36.8	8.8	----
5	Chlorides (as Cl)	3229	1101	250
6	Total Alkalinity (as CaCO ₃)	424	380	200
7	Total Hardness (as CaCO ₃)	1104	592	200
8	Calcium (as Ca)	107.2	128.0	75
9	Magnesium (as Mg)	203.1	66.0	30
10	Sodium (as Na)	1938	652	----
11	Potassium (as K)	32	30	----
12	Nitrites Nitrogen (as NO ₂ -N)	0.82	0.05	----
13	Ammonical Nitrogen (as NH ₃ -N)	BDL	BDL	----
14	Phosphates (as P)	0.07	1.82	----
15	Sulphates (as SO ₄)	76.3	142.3	200
16	Fluorides (as F)	1.62	1.10	1.0
Heavy Metals				

17	Lead (as Pb)	0.0004	0.0016	0.01
18	Iron (as Fe)	0.6514	0.5752	0.3
19	Copper (as Cu)	0.0018	0.0056	0.05
20	Zinc (as Zn)	0.0071	0.0173	5
21	Nickel (as Ni)	0.0006	0.0013	0.02
22	Cadmium (as Cd)	<0.0001	<0.0001	0.003
23	Chromium (as Cr)	0.0010	0.0009	0.05
24	Arsenic (as As)	0.0006	0.0002	0.01
25	Manganese (as Mn)	0.0300	0.0865	0.1
All values are expressed in mg/l except pH.				
Analysis report enclosed (Annexure – 21).				

Results shows that dissolved solids content in the ground water within the premises of the refinery are very high exceeding the drinking water standard limits. This may either be attributed to the intrusion of sea water or be attributed to the seepage of sea water drawn by the refinery for cooling purpose.

7.0 Sulphur balance studies:

The Joint Committee carried out Sulphur balance studies for verification of compliance of stipulated standards. For the study, committee collected Sulphur related data of crude processed and petroleum products produced during the year 2020 (January to December).

Table 17: Quantity of crude obtained from various sources and the concentrations of Benzene and Sulphur contents as per the information provided by M/s. HPCL Refinery

S. No.	Type of crude	Crude quantity (TMT)	No. of parcels	Benzene content (wt%)	Sulfur content (%)
1	MH	416.4	8	1.8	0.124
2	Bonny light	1395.7	6	0.1	0.138
3	WTI	1059.3	4	0.1	0.169
4	Quaibo	467.6	3	0.1	0.115
5	ERHA	127.7	1	0.3	0.169
6	AZERI	92.5	1	0.1	0.158
7	Kuwait	62.1	1	0.1	2.808
8	Arab Lt	206.2	8	0.1	1.997
9	Arab Ex Lt	698.5	7	0.2	1.007
10	Arab Hy	510.8	8	0.05	2.978
11	Murban	390.5	5	0.2	0.769
12	Basrah Hvy	39.9	1	0.1	4.2
12	Basrah Lt	1416.3	14	0.1	3.005
13	Das	1902.4	16	0.2	1.186
14	Ravva	285.0	5	0.1	0.052
Total		9070.9	88	0.243	1.258

Accordingly, an amount of about 22,042 metric tons of Benzene and 1,14,112 metric tons of sulfur will be having the 90,70,900 metric tons (9070.9 TMT) of crude obtained by the refinery during the year, 2020.

Table 18: Quantity of petroleum products generated and their Sulphur content

S. No.	Product	Production	Sulphur %	Sulphur quantity
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		in Tons	in product	in Tons (Actual)
1	Propylene	46,000	0.004	1.84
2	LPG	4,18,000	0.013	54.34
3	Naphtha	3,68,700	0.024	88.48
4	Motor spirit	16,72,900	0.001	16.729
5	ATF	59,100	0.036	21.276
6	SKO	1,42,200	0.019	27.018
7	Diesel	39,31,500	0.580	22802.7
8	FO 3.5 % S	9,36,100	3.5	32763.5
9	FO 1.0% S	1,68,500	1	1685
10	Bitumen	5,15,400	5.70	29377.8
11	Sulfur	34,800	--	34800
12	Refinery Fuel	7,27,300	0.22	1600.06
13	Intermediate Stream Build up	50,500		
Total:		90,71,100	--	1,23,238.743

Further, the refinery has used three types of fuels viz., fuel gas, low sulphur heavy stock (LSHS) fuel oil and CPP Naphtha for crude distillation, capital power generation, etc. purposes, which again is also having Sulphur concentrations. The quantities of various fuels used and their sulfur content have also been verified by the Joint Committee while carrying out sulfur balance studies as detailed below:

Table 19: Fuels, Sulphur concentrations and total Sulphur load of the fuels used during 2020:

S. No.	Month	Fuel quantity (Metric Tons)	Sulphur concentration	Total Sulphur (metric tons)
I	Fuel gas			
1	January	18341	82 PPM	1.50396
2	February	19105	75 PPM	1.432875
3	March	20476	69 PPM	1.412844
4	April	19341	70 PPM	1.35387
5	May	18252	63 PPM	1.149876
6	June	18618	75 PPM	1.39635
7	July	17931	66 PPM	1.183446
8	August	16456	54 PPM	0.888624
9	September	19001	53 PPM	1.007053
10	October	19264	27 PPM	0.520128
11	November	19228	21 PPM	0.403788
12	December	17667	17 PPM	0.300339
Total:		223681	---	12.553153
II	LSHS (fuel oil)			
1	January	8162	0.65 (wt%)	53.053
2	February	6252	0.51 (wt%)	31.8852
3	March	4856	0.6 (wt%)	29.136
4	April	4921	0.53 (wt%)	26.0813
5	May	7483	0.59 (wt%)	44.1497
6	June	8118	0.58 (wt%)	47.0844
7	July	7718	0.59 (wt%)	45.5362

8	August	5973	0.66 (wt%)	39.4218
9	September	6250	0.61 (wt%)	38.125
10	October	6810	0.61 (wt%)	41.541
11	November	8595	0.52 (wt%)	44.694
12	December	8338	0.59 (wt%)	49.1942
Total:		83477	---	489.9018
III CPP Naphtha				
1	January	17628	0.020 (wt%)	3.5256
2	February	17135	0.028 (wt%)	4.7978
3	March	18031	0.030 (wt%)	5.4093
4	April	17279	0.020 (wt%)	3.4558
5	May	17827	0.016 (wt%)	2.85232
6	June	16256	0.021 (wt%)	3.41376
7	July	17721	0.019 (wt%)	3.36699
8	August	16032	0.021 (wt%)	3.36672
9	September	16651	0.022 (wt%)	3.66322
10	October	17733	0.019 (wt%)	3.36927
11	November	17389	0.016 (wt%)	2.78224
12	December	14884	0.014 (wt%)	2.08376
Total:		204567	---	42.08678
Total sulfur content in the fuels used (I+II+III) during the year 2020:				544.542
Total sulfur dioxide content that has emitted by the 544.542 tons of sulfur during the year, 2020:				1,089.08
Sulfur dioxide content emitted per day during the year, 2020 :				2.98
Standard emission load of sulfur dioxide as stipulated in the APPCB CFO order dated 18.12.2019.				11.5

From the above Sulphur balance studies, it appears that the refinery is not exceeding the Sulphur dioxide emission load of 11.5 tons per day stipulated in the APPCB CFO order dated 18.12.2019.

In support of the claim of the refinery that is recovering Sulphur from the crude and its products, it has provided the quantity of recovered Sulphur for past five years from 2016-17 to 2020-21 as detailed below.

Table 20: Recovered Sulphur from the crude & its products

S. No.	Financial year (April-March)	Crude processed (TMT)	Sulphur recovered (TMT)	Sulphur shipment (TMT)	Sulphur inventory at the year-end (TMT)
1	2016-17	9,303.9	45.16	47.39	0.12
2	2017-18	9,635.0	43.50	42.89	0.73
3	2018-19	9,773.1	50.80	51.18	0.35
4	2019-20	9,115.0	37.48	36.93	0.90
5	2020-21	9,050.5	34.07	34.82	0.15

8.0 Assessment of Environmental Compensation for non-compliance:

APPCB issued directions for non-compliances to HPCL on March 19, 2020; during inspection committee verified the compliance status and observed that some of the directions have not been complied. It is also observed that the refinery has not complied the EC conditions and CFO conditions. Hence, the Committee recommends to levy environmental compensation on the refinery as detailed below:

$$EC=PI \times N \times R \times S \times LF$$

Where,

EC = Environmental Compensation in INR

PI = Pollution Index of industrial sector (red-80)

N = Number of days of violation took place (date of direction issued to date of compliance verification.)

R = A factor in Rupees for EC (Rs. 100/- may be assumed)

S = Factor for scale of operation (large-1.5)

LF = Location factor (present in Visakhapatnam where population is more than 10 lakh=2)

- i. Pollution Index of industrial sector (PI): Andhra Pradesh Pollution Control Board has categorized this industry into red category of industries and accordingly the Combined consent & Authorisation have been granted. For red category of industries, average pollution index is 80.
- ii. Number of days of violation (N): The number of days for which violation took place is considered as the period between the day of violation observed and day of compliance verified by the CPCB/ APPCB. From the available records, APPCB issued directions to HPCL on March 19, 2020 and committee verified the compliance on March 25, 2021. Based on the criteria, 371 days (from 19.03.2020 to 25.03.2021 including both the days) is considered for calculation of period of violation for estimating EC.
- iii. Scale of operation (S): The industry is considered as large as per the capital investment by the industry. Thus, scale of operation (S) for EC estimation is considered as 1.5.
- iv. Location factor (LF): The industry is located in Malkapuram and the total population within municipal boundary and up to 10 km distance from the municipal boundary of the city is 10 million and above. Thus location factor (LF) is considered as 2 for EC estimation.
- v. Factor in Rupees (R) (Rs): As per the environmental compensation estimation guidelines, factor of rupees may be minimum of Rs 100/- and maximum of Rs 500/-. The Committee decided to take rupee factor as Rs. 100/- for estimating environmental compensation as there was no environmental damage caused by these non-compliances.

S.N	Period of non-compliance	PI	S	LF	R (Rs)	N (days)	Environmental compensation (Rs)
1	19.03.2020 to 25.03.2021	80	1.5	2	100/-	371	89,04,000/-
Total EC for violating						371	89,04,000/-
Rupees eighty nine lakhs and four thousand only.							

9.0 Observations of the committee:

- i. Committee inspected HPCL known as Visakha Refinery during March 25-27, 2021. During inspection the unit was operational, however, FCCU-I, SRU train 1&2, Merox unit were not in operation. It was informed that FCCU-I is currently shutdown due to low catalyst circulation rate, and the unit is having four SRU Trains and total design feed rate of these SRUs is higher than the generated feed gas. Generally, two SRU trains will be in operation. Thus SRU Train-3 and DHT SRU were in operation.
- ii. The unit has three ETPs for treating the different streams of effluents generated. ETP –I is of the capacity 3,240 KLD, ETP – II (7,800 KLD) and ETP – IV of 4320KLD capacity. During inspection, ETP I & ETP –IV were fully operational, but, ETP –II was partially operational and was diverted to ETP –IV for further operation. It may be noted that the design capacity of ETP-IV is smaller compared to ETP-II, hence, complete treatment cannot be achieved. This is also reflected in the analysis results of ETP-IV outlet (Table 13). The chance of bypass is highly possible, however, during inspection no by-pass of effluents was observed.
- iii. In the ETP-II area, the TPI was broken down and the thick black slurry like effluent was spilled all over and was filled in the drains. The drains near ETP-II section was filled with water and white sand like material.
- iv. The storm water drains near the final outlets I & II was filled with water and when enquired, it was told that rain water. The small tank is constructed near the guard pond and it was observed that about four inches oily mark was visible. The water filled in this tank is transported to the rain water harvesting tanks through tankers.
- v. The unit has not provided closed collection system to handle the odours effluent streams. The oil-water separators and equalizations tanks are not covered to trap the VOCs. Hence, during inspection a strong odour of VOCs was sensed by the committee members in the ETP I & IV, near bio-remediation ponds and at guard pond.

- vi. The guard pond is filled with the treated effluent of ETP-I & II and ones through cooling water. It was observed that the oil was floating on the surface of the guard pond near the inlet of ETP treated water.
- vii. The hazardous waste generated by the refinery as per the authorization is stored in a separate shed under lock & key. The different types of wastes are kept separately with demarked. The wastes are disposed accordingly mentioned in the authorization.
- viii. Sludge generated from Crude/Product tanks is shifted to Sludge lagoons and is called as high oily sludge. Processing of this sludge to recover the oil is carried out through a temporary facility (Decanter, Centrifuge, RO Tank) installed by external agency. When 3000 to 5000 m³ of sludge is accumulated, tender is placed for processing of sludge. The third party by installing temporary facility such as Decanter, Centrifuge & RO Tank. The recovered oil generated is pumped to slop oil tanks for further reprocessing in CDUs. Low oily residual sludge generated out of sludge processing is taken to Bins for Bio Remediation process.
- ix. During inspection, it was noticed spillages in the sludge processing area and scatter of sludge near the sludge lagoon ponds. The sludge lagoon ponds were not covered and the VOC measured by hand held instrument showed 8 - 9 PPM. In this area strong VOC was sensed by the committee members. The industry representative informed that it is only local and is not carried to other area of the refinery.
- x. In the bio-remediation process of low oily sludge, 10 bins of 100m³ of each is constructed and filled with low oil sludge, the oil zapper bacteria at 5 kgs/m³ and nutrients of 250g/m³ is mixed along with the sludge. Periodic tilling has to be carried out. After two months the sludge has to be tested for the oil content and if required additional oil zapper bacteria and nutrients have to be added. After 10-12 months, the oil sludge will be completely degraded and can be used as manure.
- xi. However, during inspection it was noticed that the 5 bins were empty and the remaining bins was filled with sludge, but on top of the sludge high oil sludge along with biofilms was dumped. The sludge was too dried and appears that it was not tilled and aerated for the growth of bacteria for the treatment.
- xii. It was informed that the 1st batch was processed in bin no. 2, 5 & 6 and completed in March, 2020. The treated sludge was utilized for garden soil and road repair works in project Site.
- xiii. It has been observed that project had display board at the main entrance gate. However, the critical parameters viz., stack emission, ambient air quality monitoring, water, noise, VOC, etc. data are not being displayed.

- xiv. Thick black smoke emissions from the flare stacks were observed during inspection of the refinery. APPCB officials have also recorded in their reports during inspection of the refinery on 16.07.2020 and 30.11.2020, which indicate escape of incomplete and unburnt aromatic and aliphatic hydrocarbon emissions into the atmosphere.
- xv. Refinery does not have the inventory of unrecoverable volatile organics venting through the flare stacks for burning.
- xvi. It has been observed that, vide EC dated 03.02.2004 and 02.09.2009 project was under expansion from 7.5 to 10.0 MMTPA. As per EC dated 11.02.2016, project is under expansion from 8.33 MMTPA to 15.0 MMTPA. However, during inspection, no information has been provided for expansion of project from 7.5 to 8.33 MMTPA.
- xvii. It has been observed that the PAs are submitting the six monthly compliance reports with respect to latest EC dated 11.02.2016 only. However, compliance status of earlier granted EC's and monitored data of air, water, noise, etc. are not being submitted.
- xviii. Compliance of standards/norms in terms of fugitive emissions and VOC emissions monitoring at ETP area are not being implemented as per Oil Refinery Industry notified under the Environment (Protection) Rules, 1986 vide G.S.R. 186(E) dated 18th March, 2008.
- xix. The project had not provided a mobile laboratory with adequate facility to monitor ambient air quality outside the refinery premises. The condition has been imposed in the EC dated 30.05.1995. However, till date mobile laboratory was not provided.
- xx. As per CFO, there were 35 stacks were present in the project. However, continuous on-line stack monitoring facilities were provided for 32 stacks only.
- xxi. Monitoring of process emissions viz., SO₂, NO_x, HC (Methane & Non-methane), VOCs and Benzene from various units is not being done.
- xxii. The monthly Sulphur balance sheet of the refinery along with six monthly compliance reports.
- xxiii. Facilities for monitoring of HS, mercaptan, non-methane-HC and Benzene at all CAAQ monitoring stations is not being provided.
- xxiv. The comprehensive water audit reports on annual basis are not being submitted to Ministry's Integrated Regional Office.
- xxv. It has been observed that the PAs are in process of developing green belt in and around the plant premises. However, it has been observed that the plantation around the project area is not satisfactory.

- xxvi. Uploading of environmental statement for each financial year ending 31st March in Form-V on company's website is not being done.

10.0 Suggested remedial measures to mitigate pollution.

The committee suggests the following measures:

- i. The unit should comply with the all the conditions mentioned in the CFO and hazardous waste authorisation and also the directions issued by APPCB for effective and safe operation of the refinery so as to mitigate the pollution to possible extent.
- ii. The unit should take necessary steps to reduce the PM₁₀ & PM_{2.5} values in ambient air within the industry premises, the values in the CAAQMS in all the three locations shows the exceedances throughout the year 2020. The unit should spray water on the road and to plan the timings for the movement of vehicles inside the industry to control the fugitive emissions.
- iii. The five stacks monitored are meeting the prescribed standards, however, two stacks which were not monitored due to some issue in the stack monitoring platform has to be rectified.
- iv. Refinery has provided OCEMS in 32 stacks to monitor PM, SO₂, NO_x & CO and remaining 4 stacks has to be installed. The OCEMS data are connected to CPCB & APPCB servers. CEMS for measuring Hydrocarbons are yet to be installed. A few exceedances were observed during March, 2021. The industry should take periodic calibration and maintenance of analysers to avoid the exceedances in standards.
- v. The unit should rectify and repair the ETP –II components for effective treatment, the effluent spilled near the TPI area should be cleaned. The storm water drains near the ETP-II and final outlets have to be cleared for free flowing and to avoid stagnations. The small pump has to be installed in the tank constructed to collect the rain water near the guard pond to avoid manual transportation of the rain water to the ETP.
- vi. The ETPs should be operated regularly and effectively for meeting the prescribed discharge standards. The unit should install covers either floating /fixed types in the oil-water separator and equalization tanks to trap the VOCs for eliminating the odours. The trapped off-gas has to be treated to remove at least 90% of VOCs.
- vii. The unit should recycle the treated water to the maximum extent to reduce the fresh water consumption instead of fully discharging into sea along with cooling water.
- viii. At present the unit is monitoring the LDAR program annually through third party laboratory. According to the standards for equipment leaks and good practises it is advised to conduct the quarterly monitoring of LDAR for pump seals, compressor seals,

pressure relief devices & heat exchangers and annually monitor the process drains & components that are difficult to monitor.

- ix. The high oily sludge from the crude and products tanks stored in the sludge lagoons has producing VOCs, the unit has to take necessary steps to eliminate the VOCs odour in the area.
- x. The housekeeping at the sludge processing area has to be improved, the unit may take necessary action against the third party laboratory for causing spillages during sludge processing and advise to avoid spillages.
- xi. The bio-remediation of the low oily sludge has to be carried out technically and avoid dumping of unwanted waste in the bins. Before using the treated sludge as manure, it is required to analyse to check that the oily sludge is completely degraded. The oil contents in terms of Total Petroleum Hydrocarbon (TPH) after bioremediation are less than 1%.
- xii. To develop 33 % of total area as a green belt along the industry premises to stop the odour issues as well as to eliminate the fugitive emissions. The unit may plant the odour eliminating plants suitable for refinery industry.
- xiii. Refinery shall work out mass & material balance studies and maintain the inventory of unrecoverable volatile organics venting through the flare stacks for burning. Records to this effect shall be produced before the regulatory officials as and when required.
- xiv. Suggested that the refinery shall procure, install and operate one Continuous Ambient Air Quality Monitoring station (CAAQMS) with PM 10, PM2.5, CO, O3, SO2, NO2, NH3, Benzene, H2S and Mercaptans parameters at an appropriate location in the residential areas of Malkapuram to assess the impact of refinery activities.

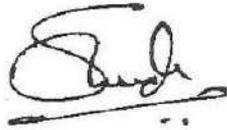
11.0 Concluding remarks:

- a. The unit is not complying the majority of condition stipulated in Environmental Clearances granted to Visakha Refinery.
- b. The unit is not complying with the majority of consent & authorisation conditions issued by APPCB on March 9, 2021; these are the same conditions given by APPCB at the time of consent & authorisation renewal.
- c. APPCB had issued 16 points directions for non-compliance on March 19, 2020; the unit is not complying for 6 points and partially complied for one point even after one year.
- d. The committee had monitored stack emissions at five stacks, manual ambient air quality monitoring at three locations and CAAQM using mobile van at two locations. The stack emissions are meeting the prescribed standards, the ambient air quality for PM₁₀, PM_{2.5}

parameter is exceeding at all the five locations, at one point near the ETP – IV area the concentration value of SO₂ is exceeding the standards.

- e. The effluent discharge standards for the ETP outlet of I & IV are not meeting, however due to mixing of one time cooling water with the treated effluent at the final discharge point, the prescribed discharge parameters are meeting the standards.
- f. The committee calculated the prescribed pollution load for effluent & emission in CFO and are meeting the prescribed standards.
- g. The committee calculated environmental compensation for violation & non-compliance of the directions issued by APPCB and levied Rs. 89,04,000/- (Rupees eighty nine lakhs and four thousand only). M/s. HPCL, Visakha Refinery has to pay Rs. 89,04,000/- to APPCB.
- h. The unit have to ensure self-monitoring, self-compliance and comply with statutory guidelines, safety measures, and directions issued by MOEF & CC, CPCB, APPCB, Directorate of Factories and other Regulatory Authorities.

Report dated May 26, 2021



Dr. Suresh Babu Pasupuleti
Scientist-C

Ministry of Environment, Forest & Climate
Change, Vijayawada



Smt. Poornima B M
Scientist D

Central Pollution Control Board
Regional Directorate, Chennai



Dr. B. V. Prasad

Senior Environmental Scientist
Andhra Pradesh Pollution Control Board
Vijayawada



Dr. N. Lingaiah

Senior Principal Scientist
Catalysis & Fine Chemicals Division,
CSIR-IICT, Hyderabad

6. Earlier they have assessed an environment compensation of Rs. 26,61,551/- (26 lakhs sixty one thousand five hundred fifty one) in respect of pollution caused due to the fire incident happened on

25.05.2021. They have further assessed an environment compensation of Rs. 89,04,000/- (Eighty Nine lakhs four thousand) for the violation and non-compliance of the directions.

7. The Learned Counsel for the applicant as well as 7th respondent submitted that they want to file objections to the Committee reports as according to the applicant, the amount of compensation imposed is not proper and they have not mentioned anything about further action taken report on the basis of the continuous violation as well.

8. The Pollution Control Board as well MoEF&CC are directed to file their independent action taken report on the basis of the observations made by the Joint Committee regarding the alleged violations and also non-compliance of the conditions of developing green belt and other conditions issued in the environment clearance granted and permission granted.

9. They have not mentioned what is the extent of green belt developed and also whether there is any possibility of developing green belt in that area and if it could not be developed within the complex, what is the further remedial measures to be taken for improving the green belt within the permissions to mitigate air as well as odour pollution.

10. The Committee has also not mentioned as to whether the guidelines provided by the Indian Institute of Science in 2016 have been complied with by the 7th respondent or not. Further, it

is seen from the report that the violations are in existence since long time and even earlier certain deficiencies have been found and notice have been issued by the Pollution Control Board in that regard. So, the number of days of violation taken appears to be not correct. They will have to take the cumulative act of violations for the purpose of ascertaining the number of days violated for the purpose of calculating the compensation, which has been reiterated by the Principal Bench as well as this Tribunal in several cases of this nature.

11. So, under such circumstances, we direct the Committee to re-visit those aspects and submit a further report incorporating their suggestions and recommendations on the basis of the observations made by this Tribunal.

12. The MoEF&CC as well as Andhra Pradesh Pollution Control Board are directed to file further action taken report on the basis of the violations noted by them, which they are expected to take as a regulator under the respective statutes and notification. They are also directed to file further action taken report to this Tribunal before the next hearing date.

13. The Committee as well as MoEF&CC and Pollution Control Board are directed to file their further reports to this Tribunal on or before 12.11.2021 by e-filing in the form of Searchable PDF/OCR Supportable PDF and not in the form of Image PDF along with necessary

hardcopies to be produced as per Rules.

14. The parties are at liberty to file their objections, if any, to the Committee reports within 3 weeks and submit a copy of the same to the members of the Committee, so that they can go through the same and submit their views on the same while submitting further report as directed by this Tribunal.

15. In the meantime, the parties are also directed to complete the pleadings.

16. The Registry is directed to communicate this order to the members of the Committee as well as official respondent, Andhra Pradesh Pollution Control Board for their information and compliance of the directions issued by this Tribunal.

17. For completion of pleadings, objection, if any, to the reports and consideration of further reports, post on 12.11.2021.

.....J.M.
(Justice K. Ramakrishnan)

.....E.M.
(Shri. Saibal Dasgupta)

**O.A. No.73/2021,
17th September, 2021. AM.**

Details of Location wise Plantations raised by Social Forestry Division, Visakhapatnam funded by Hindustan Petroleum Corporation Limited

Sl. No	Name of the Range	Date of Counting	Name of the Location	Actual Planting points	No of Plants Counted by HPCL
1	SF VSP-I	2.4.2018 to 18.4.2018	Jaggayyapalem Railway Yard	4000	3500
2			Gopalapatnam to Duvvada	3000	2650
3			Narava GVMC, MLDSTP	2500	2300
4			Gopalapatnam yard near Yelapuvanipalem	3000	2750
5			Porlupalem Andhra Cements	1000	850
6			Simhachalam North cabin area	2000	1950
7			simhachalam to Gopalapatnam	2000	1850
8			Pendurthi Railway Station	1100	950
9			Guraampalem APIIC	1000	900
10			Thatichettlapalem Rly. Ground area	1000	850
11			Thatichettlapalem Rly. New Quarters	1000	900
12			Dharmanagar Aswirwad Kalyanamandapam	1000	910
13			Vadapeta Rly. Area	1000	900
14			Kancharapalem Dhobi ghat	2500	2265
15			Gnanapuram Rly. Area	2000	1750
16			Gollalapalem Nanginarupadu Rayapuraju Tank	30000	27000
17			Kambalakonda ECO Tourism Park	350	350
18			AIMS At Yendada	500	450
19			Rushikonda Surrounding Area	1000	900
20			Narava GVMC, MLDSTP	400	360
21			Container Corporation of India Ltd. Opp. Airport	1000	950
22			Santhosh nagar to Venkatapuram bridge	1500	1400
23			Chinamushidiwada to Laxminarasimha nagar	1400	1250
24			Sapthagiri colony and Surrounding Area	1000	900
25			Sujathanagar Teachers Colony Surrounding Area	2000	1800
26			Nagamalli Colony and surrounding area	1000	900
27			Venkatadrinagar to Karunyanagar	2000	1850
28			Guraampalem APIIC	1500	1350
29			GCC Govt.Colony Juttada	1250	1200
30			Madhurawada to Bakkannapalem	1000	900
31			SF Vsp-II	Electric Sub Station, Pedagandyada	3000
32	Police housing complex			2000	1850
33	Railway authorities area track side, Aganampudi			8600	7800
34	Meghadrigedda Visakha Port Trust area			4500	3900
35	Primary Health Center, Pedagantyada			600	550
36	AVN College complex, Visakhapatnam			2000	1900
37	APIIC area, Tungalam			800	500
38	Visakha Air Port beside Kondagedda area Visakha Port Trust land)			6000	5700
39	Indian Strategic Petroleum Reserves Ltd., (HPCL)			3300	3200
40	V.V. School, Pedagantyada surroundings			1800	1700
41	Sheelanagar via toll gate to fertilizer godowns upto bulb area (VPT land			4600	3800
42	Thadi Sivalayam surroundings			10500	8900
43	Yeleru Canal Steel Plant limits			11600	9850
44	Kondakoppaka limits of Yeluru canal			8250	7930
45	Kotturu highway side of Yeleru canal		7450	5820	
46	SF ELM		Satyanarayana temple around the hill, Anakapalli	10000	9000
47			AMAL College, Old Railway Station to Mulapeta under bridge	4000	3500
48			Lankelapalem over bridge to thadi Railway station	4000	3500
49	SF CDM		Lankelapalem Railway area to Mudumadelu	2000	1500
50			Govt. ITI, Pedagantyada	1000	1000
51			Police training center, Bakkannapalem	15000	14450
52			SVLNS Govt. Degree College, Bheemili	6000	5600
53			MJPAPBCW Residential School for Boys, Simhachalam	3000	2800
54			A.P. Govt. Residential School for Girls, Bheemili	1000	850
55			Aganampudi, Santhinagar & Senivada Colony	2000	1500
56			Ramaraidupeta to T.Sirsapalli	1000	300
57			T.Sirsapalli to Venkatapuram	1000	150
58	Venkatapuram to Thanam		1000	100	
Grand Total:				200000	177335

M/s Hindustan Petroleum Corpn. Ltd., Visakhapatnam counted the no.of plants and observed that survival is 89 % and the plants are in good condition

Taken Over



Forest Range Officer,
S.F. Range
Visakhapatnam-I

Taken Over



Forest Range Officer,
S.F. Range
Visakhapatnam-II

Taken Over



Forest Range Officer,
S.F. Range
Elamanchili

Taken Over



Forest Range Officer,
S.F. Range
Chodavaram

Handed over



Hindustan Petroleum Corpn.
Visakhapatnam

**A.P. POLLUTION CONTROL BOARD
ZONAL OFFICE:: VISAKHAPATNAM**

Circular Memo.No.13570/APPCB/ZO/VSP/2020-2240

dated 14/07/2020

Sub: APPCB-ZO-VSP-Constitution of emergency response teams-Allotment of duties- Orders-issued-Reg.

In light of the accidents occurred at M/s LG Polymers India Pvt. Ltd., Visakhapatnam and M/s Sainor Life Sciences Pvt. Ltd., Parawada, Visakhapatnam in short duration, it is decided to constitute emergency response teams to be prepared in time of emergency and accidents.

The team shall consist of one regular officer JSO/AEE/Analyst Gr.I (Team Leader), one Outsourcing AEE/Analyst, one Filed Assistant and Driver. The team leader and the outsourcing analyst shall be stayed at home and be available, respond to phone calls and shall reach the office in 15 minutes as and when required in case of emergency. The field assistant and driver shall stay in office on duty days from 08.00 PM to next day 08.00 AM. Any request for change in duty shall only be on mutual concern of respective groups and mutual exchange of duties if any, shall only be with the permission of Sri R. Veerendra Kumar, JSO.

Non-availability or non-responsiveness of any member on duty will be viewed very seriously and immediate disciplinary proceedings will be initiated immediately.


JOINT CHIEF ENVIRONMENTAL ENGINEER

To

The Concerned.

Copy to the Assistant Manager (A&A)(FAC), APPCB, Zonal Office, Visakhapatnam to make necessary arrangements for staff on duty staying at office.



ANDHRA PRADESH POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN, A-3, INDUSTRIAL ESTATE,
SANATHNAGAR, HYDERABAD - 500 018.

Annexure - 4

Phone: 040-23887500
Fax: 040- 23815631
Grams: Kalusya Nivarana
Website:

Regd. Post With Ack Due

Order No. 702/APPCB/TF-VSP/2002-162

Dt. 14.12.2011.

DIRECTIONS

Sub:- M/s. Hindustan Petroleum Corporation Limited (Visakh Refinery), Malkapuram, Visakhapatnam – Non-compliance of the Board directions and standards – Odour nuisance being experienced to the general public of Visakhapatnam - Hearing held – **Directions Issued** - Reg.

- Ref:-**
1. CFO & HWA Order No. APPCB/VSP/VSP/72/CFO/HO/2011-1433, dt. 16.08.2011.
 2. Order No.702/PCB/TF-VJA/2002- 22, dt.03.04.2006.
 3. Order No.702/PCB/TF-VJA/2002- 2331, dt.28.02.2009.
 4. Order No.702/PCB/TF-VJA/2002- 1676, dt.09.03.2010.
 5. Order No.702/PCB/TF-VJA/2002- 09, dt.06.09.2010.
 6. Order No.702/PCB/TF-VJA/2002- 312, dt.18.05.2011.
 7. Order No.702/PCB/TF-VJA/2002-09-07, dt.17.09.2011.
 8. Complaints received from the general public and District Administration regarding smell nuisance and adverse news items appeared in the news paper and electronic media in Visakhapatnam.
 9. Show-cause notice No. 702/PCB/TF-VSP/2011-85 dt. 08.11.2011.
 10. Inspection of the industry by the Board officials on 05.11.2011, 09.11.2011 & 11.11.2011, 22.11.2011 & 23.11.2011.
 11. Draft report of Rapid Assessment of Environmental Pollution Studies for HPCL – Refinery conducted by M/s. NEERI
 12. M/s. HPCL, Visakhapatnam letter dt. 09.12.2011
 13. Task Force Committee meeting held on 14/12/2011.



WHEREAS you are operating an Oil Refinery in the name & style of M/s. Hindustan Petroleum Corporation Limited (Visakh Refinery) at Malkapuram, Visakhapatnam and producing the Petroleum Products.

WHEREAS vide reference 1st cited, the A.P. Pollution Control Board issued combined Consent for Operation and Hazardous Waste Authorisation to your industry to process the crude of 10 MMTPA and to produce different petroleum products with a validity period up to 31/12/2012 duly stipulating necessary standards and conditions.

WHEREAS vide reference 2nd to 6th cited, the A.P. Pollution Control Board issued certain directions to your industry for compliance within the time schedules stipulated.

WHEREAS vide reference 7th cited, the A.P. Pollution Control Board reviewed the status of the industry under Comprehensive Environmental Pollution Index (CEPI) Action Plan and issued certain directions to your industry for compliance within the time schedules stipulated. But you have not complied the directions issued by the Board.

WHEREAS vide reference 8th cited, the general public of Visakhapatnam experienced severe odour nuisance in the 1st week of November'2011 and the matter was

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published in the local news papers and electronic media about the odour nuisance faced by people of Visakhapatnam. The Collector & District Magistrate, Visakhapatnam has also brought the same issue to the notice of the Regional Officer, Visakhapatnam and Member Secretary, A.P. Pollution Control Board.

WHEREAS the Joint Chief Environmental Scientist, Central Laboratory, Board Office, Hyderabad & Senior Environmental Engineer, Task Force, Visakhapatnam inspected the industry on 11.11.2011 and observed that the similar smell experienced in the city was also observed in the Merox area due to Mercaptans.

WHEREAS vide reference 9th cited, the Board issued a Showcause notice to your industry for causing severe air pollution with a direction to take corrective measures to eliminate the smell nuisance.

WHEREAS vide reference 10th cited, a team of Board officials consisting of JCES, SEE-TF, Visakhapatnam, SES, Visakhapatnam, Scientists and Engineers inspected your industry and surroundings on 05.11.2011, 09.11.2011 & 11.11.2011, 22.11.2011 & 23.11.2011 and conducted comprehensive monitoring of all the stacks and made the following observations.

1. CAAQM station data located near the store yard of the refinery which was in down ward direction of the industry showed that the SO₂ levels suddenly shot up to 114.929 µg/m³ at about 4-5 PM on 3.11.2011. Simultaneously, NO_x levels have increased to 237.784 µg/m³ during the period. SO₂ levels were in the range 60 µg/m³ till 3 AM of 04.11.2011 and residents of Visakhapatnam faced severe smell nuisance at the same time. This clearly indicated that there were huge SO₂ emissions from the refinery operations and prime cause for the smell nuisance in Visakhapatnam.
2. The smell nuisance continued till 12.11.2011 from the refinery due to the processing of high sulfur crude.
3. The SO₂ levels in Ambient air around the refinery recorded high values for the period 04.11.2011 to 10.11.2011 i.e in the range of 70 to 159 µg/m³ and subsequently came to normal.
4. A team of Board's officials conducted comprehensive monitoring of all stacks on 22nd and 23rd November 2011 and found that the SO₂ load of stack emissions were 11.826 TPD even after switching over to the low & medium sulfur crude.
5. Emission volumes were exceeding the norms stipulated in the consent order Dt. 16.08.2011 as detailed below.

Date of monitoring	Stack attached to	Flue gas discharge (NM3/Hr)	Consented quantity of emissions in NM3/Hr at peak flow	Excess flow
09.11.11	Stack attached to DHDS-PDS Heater 61F01	7430	1566	5864
09.11.11	Stack attached to D-SRU-3 Incinerator 79F310	6732	1519	5213
10.11.11	Stack attached to CDU-I Crude Oil heater 2F1	37410	33009	4401
10.11.11	Stack attached to CDU-II Reduced Crude Oil heater 12F1	34703	25716	8987

10.11.11	Stack attached to CDU-III Crude Oil heater 42F1	77329	57300	20029
10.11.11	Stack attached to VBU Feed heater 46F1	56995	31500	25495
12.11.11	Stack attached to DHDS-PDS Heater 61F01	6788	1566	5222
12.11.11	Stack attached to CDU-II Reduced Crude Oil heater 12F1	45251	25716	19535
12.11.11	Stack attached to D-SRU-3 Incinerator 79F310	8112	1519	6593
12.11.11	Stack attached to CDU-II Crude Oil heater 11F1	86600	79812	6788
13.11.11	Stack attached to D-SRU-3 Incinerator 79F310	24123	1519	22604
13.11.11	Stack attached to CDU-I reduced Crude Oil heater 2F4	39277	24470	14807
22.11.2011	Stack attached to CDU-II Reduced Crude Oil heater 12F1	47826.78	25716	22110.8
22.11.2011	Stack attached to CDU-III reduced Crude Oil heater 42F2	30310.61	15300	15010.6
22.11.2011	Stack attached to FCCU-1 feed heater 4F51	56382.35	21487	34895.3
22.11.2011	Stack attached to CPP-Heat recovery steam generator-HRSG-III	327879.8	320388	7491.8
22.11.2011	Stack attached to FCC-NHT 72-F-01	10262.22	1310	8952.2
22.11.2011	Stack attached to PDS Heater 61F01	4771.307	1566	3205.3
22.11.2011	Stack attached to D-SRU-3 Incinerator 79F310	5759.287	1519	4240.3
22.11.2011	Stack attached to FCCU-II, 14F1	22724.37	20514	2210.4
22.11.2011	Stack attached to FCCU-II CO Boiler 14F2	121369.9	93000	28369.9
23.11.2011	Stack attached to CDU-II Reduced Crude Oil heater 12F1	47826.78	25716	22110.8
23.11.2011	Stack attached to CDU-III reduced Crude Oil heater 42F2	30310.61	15300	15010.6
23.11.2011	Stack attached to FCCU-1 feed heater 4F51	56382.35	21487	34895.3
23.11.2011	Stack attached to CPP-Heat recovery steam generator-HRSG-III	327879.8	320388	7491.8
23.11.2011	Stack attached to FCC-NHT 72-F-01	10262.22	1310	8952.2
23.11.2011	Stack attached to PDS Heater 61F01	4771.307	1566	3205.3
23.11.2011	Stack attached to D-SRU-3 Incinerator 79F310	5759.287	1519	4240.3
23.11.2011	Stack attached to FCCU-II, 14F1	22724.37	20514	2210.4
23.11.2011	Stack attached to FCCU-II CO Boiler 14F2	121369.9	93000	28369.9

6. The industry is not meeting the source based emission norms for SPM which are tabulated below

Sl. No.	Date of monitoring	Stack attached to	SPM standard in mg/Nm ³	SPM monitored value in mg/Nm ³
1	09.11.2011	SRU-3 incinerator	10 mg/Nm ³	99.6 mg/Nm ³
2	10.11.2011	VBU feed heater	115 mg/Nm ³	145 mg/Nm ³
3	10.11.2011	FCCU-II CO boiler	115 mg/Nm ³	195.6 mg/Nm ³
4	11.11.2011	FCCU – II feed	115 mg/Nm ³	132.4 mg/Nm ³

		heater		
5	12.11.2011	SRU-3 incinerator	10 mg/Nm3	133.2 mg/Nm3
6	13.11.2011	SRU-3 incinerator	10 mg/Nm3	61.6 mg/Nm3
7	22.11.2011	FCCU-I CO boiler	115 mg/Nm3	134.9 mg/Nm3
8		NHT	10 mg/Nm3	29 mg/Nm3
9		DHDS heater	115 mg/Nm3	142.1 mg/Nm3
10		SRU Incinerator	115 mg/Nm3	141.2 mg/Nm3
11		SRU-3 incinerator	10 mg/Nm3	149.1 mg/Nm3
12		FCCU – II	115 mg/Nm3	188.1 mg/Nm3
13		FCCU – II CO Boiler	115 mg/Nm3	138.3 mg/Nm3
14	23.11.2011	FCCU –I CO Boiler	115 mg/Nm3	145.0 mg/Nm3
15		CCR	10 mg/Nm3	22.2 mg/Nm3
16		DHDS heater	115 mg/Nm3	129.6 mg/Nm3
17		IBH	115 mg/Nm3	143.7 mg/Nm3

- APPCB stipulated SPM load based standard as 1.11 TPD. The Board Officials conducted the stack monitoring for 18 stacks during 9th, 10th and 11th of November and estimated that the total SPM load from the 18 stacks itself 1.569 TPD. Remaining 12 stacks were not monitored at that time, which is also exceeding the stipulated norm for SPM.
- During comprehensive monitoring on 22nd and 23rd November, the SPM loads were estimated as 1.7022 TPD & 1.579 TPD respectively as against the standard of 1.11 TPD.
- The industry was not meeting the effluent standards as stipulated in the CFO Order. The industry was exceeding the standards for the Oil & Grease, BOD, Phenols & Sulphides which are given below:

ETP – I DMF Outlet

Parameters	Standards	Jan'11	Mar'11	Apr'11	May'11	Jun'11	Jul'11	Aug'11	Sep'11	Oct'11	Nov'11
pH	6.5 - 8.5	6.02	7.31	7.27	11.6	7.47	7.27	7.2	7.8	7.2	7.7
TSS	100	17.0	22.0	22.0	48.0	22.0	62	44.0	14.0	16.0	12.0
BOD	15.0	27.0	19.0	22.0	33.0	24.0	48	24.0	20.0	22.0	-
Phenols	0.35	0.94	0.94	1.21	1.42	0.60	2.12	1.28	1.1	1.0	0.98
Sulphide	0.5	1.02	0.74	0.92	1.20	0.80	1.8	1.1	9.0	4.0	12.0
Oil & Grease	5.0	11.0	8.0	10.0	10.0	8.0	18	11	6.0	4.0	5.0

ETP – II GAC OUTLET

Parameters	Standards	Jan'11	Mar'11	Apr'11	May'11	Jun'11	Jul'11	Aug'11	Sep'11	Oct'11	Nov'11
pH	6.5 - 8.5	7.46	6.82	7.32	5.02	7.82	7.27	8.5	6.7	7.1	6.8
TSS	100	12.0	20.0	16.0	24.0	18.0	22.0	38.0	30	31	20.0
BOD	15.0	22.0	16.0	14.0	15.0	16.0	16.0	15.0	14	15	-
Phenols	0.35	0.84	0.77	0.36	0.51	0.47	0.64	0.52	0.9	0.8	0.8
Sulphide	0.5	0.52	0.54	0.34	0.42	0.47	0.6	0.58	5.0	4.0	4.0
Oil & Grease	5.0	9.0	6.0	8.0	7.0	5.0	6.0	5.0	4.0	3.0	5.0

*bold figures were exceeded the norms.

10. As per the G.S.R. 186 (E), dt.18.03.2008 issued by MoE&F, the industry shall meet the Oil & Grease norm of 1 mg/lit for the cooling effluent. But the Oil and grease in the cooling water was in the range of 3-4 mg/lit, which were collected in the months of July, August, September & November'2011.
11. The meter attached to quantify the off gases routed to the flare was not functioning to ascertain the quantity of gases routed to flare.
12. The industry stocked about 3300 T of oily sludge i.e hazardous wastes in the premises, which was accumulated since a long period and is a violation under the provisions of HWM Rules.
13. The industry has violated the CFO Condition No. 8 by not carrying out the performance evaluation of each unit in ETP and not submitted the report so far.
14. The industry violated the CFO condition no. 17 by using high sulphur crude during bad weather conditions and inversions.

Whereas A.P. Pollution Control Board entrusted a work to M/s. NEERI, Nagpur to study the Rapid Assessment of Environmental Pollution Studies for HPCL – Refinery, Hindustan Zinc Ltd., and VPT. In the draft report, M/s. NEERI reported that there are large variations in the SO₂ emissions (6.0 TPD to 21.1 TPD) estimated on the basis of monitored data and also indicated high variation in Sulfur content of the fuel and crude in HPCL Refinery.

Whereas CPCB officials inspected the refinery from 25th to 27th of April 2011 and observed that the treated effluent is not meeting the standards prescribed.

WHEREAS hearing was conducted by the Task Force Committee of A.P. Pollution Control Board on 14/12/2011 to review the status of the industry. The representatives of the industry attended the hearing and explained about the pollution control measures implemented by them and submitted a representation Dt. 09.12.2011 mentioning that the emission levels of SO₂ are within the consented load of 11.5 TPD and SO₂ concentrations in Ambient air also within the NAAQ standard. The Committee discussed about the status of compliance of the earlier task force directions, consent conditions and the monitoring reports conducted by the Board. After a detailed discussion, the Committee recommended to issue certain directions to your industry:

After detailed discussions and careful consideration of material facts of the case and as per the recommendation of the Committee, **the A.P. Pollution Control Board issues the following directions:**

1. **The industry shall restrict the production capacity to 70% of the Consented quantity permitted in the Consent Order dt. 16.08.2011 i.e., the industry shall process the crude to the tune of 7 MMTPA only with the crude having a sulfur content less than 2% during winter i.e., from October to January.**

(OR)

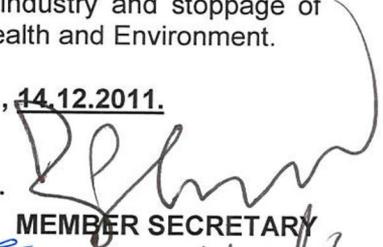
The industry shall process crude containing sulphur content <0.5 % during the period from October to January every year for normal production as consented (CFO) by A.P. Pollution Control Board.

2. The industry shall install on-line P^H meter to the Merox unit to measure the P^H of NaOH. The mercaptane in the spent NaOH shall be precipitated before discharging into ETP.
3. The industry shall submit the inventory of the Crude, products and Sulfur balance on weekly basis to the RO, Visakhapatnam failing which HPCL will be called for explanation and necessary action will be taken.
4. The industry shall provide 7 No. of online stack analysers by January 2012 and rest of the online stack analysers by March 2012 and the same shall be connected to APPCB website, failing which the Bank Guarantee of 1.5 crores would be forfeited without further notice.
5. The industry shall comply with all the conditions stipulated in the Order dt. 18.05.2011 & 17.09.2011.
6. The industry shall comply with the conditions stipulated in the Consent for Operation Order dt. 16.08.2011.

These directions are issued under Sec.33 (A) of Water (Prevention and Control of Pollution) Amendment Act, 1988 and under Sec. 31 (A) of Air (Prevention and Control of Pollution) Amendment Act, 1987.

You are further directed to note that, if you do not comply with the directions issued, further action will be initiated against your industry under Sec. 33(A) of Water (Prevention and Control of Pollution) Amendment Act, 1988 and under Sec. 31 (A) of Air (Prevention and Control of Pollution) Amendment Act, 1987 for closure of your industry and stoppage of Power supply without any further notice, in the interest of Public Health and Environment.

This Order comes into effect from today i.e., 14.12.2011.


MEMBER SECRETARY

To
The Occupier,
M/s. Hindustan Petroleum Corporation Ltd.,
Visakha Refinery,
Post Box No.15,
Visakhapatnam-530 011.

Copy to:

✓ The Joint Chief Environmental Engineer, A.P. Pollution Control Board, Zonal Office, Visakhapatnam for information and necessary action.

The Senior Environmental Engineer (CFO), A.P. Pollution Control Board, Board Office, Hyderabad for information and necessary action.

The Environmental Engineer, A.P. Pollution Control Board, Regional Office, Visakhapatnam for information.



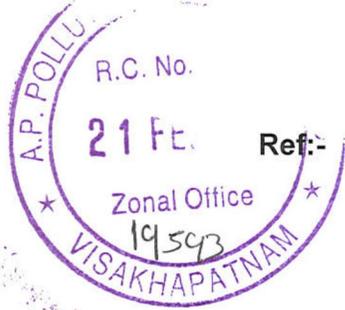
Regd. Post With Ack Due

Order No. 702/APPCB/TF-VSP/2002-235

Dt. 16.02.2012.

DIRECTIONS

Sub:- M/s. Hindustan Petroleum Corporation Limited (Visakh Refinery), Malkapuram, Visakhapatnam – Non-compliance of the Board directions and standards – Odour nuisance being experienced to the general public of Visakhapatnam - Hearing held – **Directions Issued** - Reg.



- Ref:-**
1. CFO & HWA Order No. APPCB/VSP/VSP/72/CFO/HO/2011-1433, dt. 16.08.2011,
 2. Order No.702/PCB/TF-VJA/2002- 22, dt.03.04.2006,
 3. Order No.702/PCB/TF-VJA/2002- 2331, dt.28.02.2009,
 4. Order No.702/PCB/TF-VJA/2002- 1676, dt.09.03.2010,
 5. Order No.702/PCB/TF-VJA/2002- 09, dt.06.09.2010,
 6. Order No.702/PCB/TF-VJA/2002- 312, dt.18.05.2011,
 7. Order No.702/PCB/TF-VJA/2002-09-07, dt.17.09.2011,
 8. Order No. 702/APPCB/TF-VSP/2002 - Dt. 14.12.2011,
 9. Collector & District Magistrate, Visakhapatnam letter dt. 13.02.2012,
 10. Joint inspection of the Refinery by MRO, Visakha Urban and APPCB Officials dt.15.02.2012.
 11. Complaints received from the general public, organizations and District Administration regarding smell nuisance and adverse news items appeared in the news paper and electronic media in Visakhapatnam on 15.02.2012 & 16.02.2012
 12. Task Force Committee meeting held on 16.02.2012.

WHEREAS you are operating an Oil Refinery in the name & style of M/s. Hindustan Petroleum Corporation Limited (Visakh Refinery) at Malkapuram, Visakhapatnam and producing the Petroleum Products.

WHEREAS vide reference 1st cited, the A.P. Pollution Control Board issued combined Consent for Operation and Hazardous Waste Authorisation to your industry to process the crude of 10 MMTPA and to produce different petroleum products with a validity period up to 31/12/2012 duly stipulating necessary standards and conditions.

WHEREAS vide reference 2nd to 7th cited, the A.P. Pollution Control Board issued certain directions to your industry to comply the directions within the time stipulated.

WHEREAS vide reference 8th cited, the A.P. Pollution Control Board imposed restriction on crude throughput capacity & crude specification till January'2012 after reviewing the status of compliance of the earlier task force directions, consent conditions, meteorological conditions in Visakhapatnam bowl area and based on monitoring reports of the Board.

WHEREAS vide reference 9th cited, the Collector & District Magistrate, Visakhapatnam has brought the odour nuisance problem to the notice of the Member Secretary, A.P. Pollution Control Board and requested the Board to continue the restriction on production capacity of Refinery for some more time till the temperatures rise appreciably and the smell nuisance problem was controlled.

WHEREAS vide reference 10th cited, during the joint inspection conducted by MRO, Visakha Urban and APPCB Officials, it was observed that the smell experienced in the city as well in the plant premises and surroundings are similar in nature and wind direction was also from Refinery to towards the City.

WHEREAS vide reference 11th cited, the public of Visakhapatnam experienced severe odour nuisance, and the matter was published in the local news papers and electronic media. The Board also received several representations from different public organizations and political parties about the odour nuisance.

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WHEREAS hearing was conducted by the Task Force Committee of A.P. Pollution Control Board on 16.02.2012 to review the status of the industry. The representative of the industry attended the hearing and explained the pollution control measures implemented by the refinery and also informed that the obnoxious smell in the city could be due to meteorological conditions. The Committee discussed about the status of compliance of the earlier task force directions, consent conditions, meteorological conditions and the monitoring reports of the Board. After a detailed discussion, the committee recommended to extend the time period of the direction no. 1 issued by the Board vide order dt. 14.12.2011 i.e restriction on production capacity upto 29.02.2012 and shall comply with the remaining directions issued in the same order.

After detailed discussions and careful consideration of material facts of the case and as per the recommendation of the Committee, **the A.P. Pollution Control Board issues the following directions.**

1. **The industry shall restrict the production capacity to 70% of the Consented quantity permitted in the Consent Order dt. 16.08.2011 i.e., the industry shall process the crude to the tune of 7 MMTPA only with the crude having a sulfur content less than 2% upto 29.02.2012.**

(OR)

The industry shall process crude containing sulphur content <0.5% upto 29.02.2012 for normal production as consented (CFO) by A.P. Pollution Control Board.

2. **The industry shall comply with the remaining directions issued vide order dt.14.12.2011.**

These directions are issued under Sec.33 (A) of Water (Prevention and Control of Pollution) Amendment Act, 1988 and under Sec. 31 (A) of Air (Prevention and Control of Pollution) Amendment Act, 1987.

You are further directed to note that, if you do not comply with the directions issued, further action will be initiated against your industry under Sec. 33(A) of Water (Prevention and Control of Pollution) Amendment Act, 1988 and under Sec. 31 (A) of Air (Prevention and Control of Pollution) Amendment Act, 1987 for closure of your industry and stoppage of Power supply without any further notice, in the interest of Public Health and Environment.

This Order comes into effect from today i.e., 16.02.2012.


MEMBER SECRETARY

To
The Occupier,
M/s. Hindustan Petroleum Corporation Ltd.,
Visakha Refinery,
Post Box No.15,
Visakhapatnam-530 011.

Copy to

✓ The Joint Chief Environmental Engineer, A.P. Pollution Control Board, Zonal Office, Visakhapatnam for information and necessary action.

The Senior Environmental Engineer (CFO), A.P. Pollution Control Board, Board Office, Hyderabad for information and necessary action.

The Environmental Engineer, A.P. Pollution Control Board, Regional Office, Visakhapatnam for information and to verify the compliance status on regular basis.



ANDHRA PRADESH POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, A-3, INDUSTRIAL ESTATE,
SANATHNAGAR, HYDERABAD - 500 018.

Phone: 040-23887500
Fax: 040-23815631
Grams : Kalusya Nivarana
Website : www.appcb.ap.nic.in

Reqd. Post With Ack Due

Order No. 702/APP/PCB/UH-II/TF-VSP/2016-

Dt. 03.10.2016

DIRECTIONS

Sub: APPCB – TF – HO - M/s. Hindustan Petroleum Corporation Ltd., (Visakha Refinery), Malkapuram, Visakhapatnam. – Non-compliance of Board directions and CFO conditions – Legal Hearing held on 16.09.2016 - DIRECTIONS – Issued - Reg.

Ref:

1. Order No.702/APP/PCB/TF-VSP/2002-235, dt.16.02.2012.
2. Consent Order No.APPCB/VSP/VSP-72/CFO/HO/2016, dt.24.03.2016.
3. Board Officials inspected on 27.07.2016 under Randomized risk based inspections.
4. External Advisory Committee (Task Force) Meeting held on 16.09.2016.

WHEREAS you are operating the industry in the name & style of M/s. Hindustan Petroleum Corporation Ltd., (Visakha Refinery), Malkapuram, Visakhapatnam and producing the Petroleum Refinery.

WHEREAS vide reference 1st cited, the Board issued certain directions to the industry on 16.02.2012 for non-compliance of the Board directions and odour nuisance being experienced to the general public of Visakhapatnam.

WHEREAS vide reference 2nd cited, the Board issued Consent for operation and Hazardous Waste Authorisation to the industry on 24.03.2016 valid up to 31.12.2020 subject to the compliance of standards and conditions stipulated for operating Petroleum Refinery & Diesel Hydro Treater.

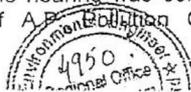
WHEREAS vide reference 3rd cited, the Board officials inspected the industry on 27.07.2016 under randomized risk based inspections and observed the following:

- 1) The industry has not constructed STP for treatment of effluents.
- 2) The Board's officials carried out comprehensive stack monitoring from 06th Jan to 08th Jan – 2016 and observed that the load based standard of SPM is exceeding the standards.

Load based standard	Measured Value
SPM - 1.11 TPD	1.145 TPD
SO ₂ - 11.5 TPD	9.412 TPD

- 3) Few occasions, black smoke is observed through flare stacks.
- 4) Odour nuisance is observed at ETP area.
- 5) Frequently complaints are receiving from the city residents against odour nuisance.
- 6) The industry installed and operating 3 Nos. of CAAQM stations and uplinked to the Board's website. As per the CAAQM data for the last one year, the values are within the limits.
- 7) 45 Acres of green belt is available in the refinery premises. HPCL-VR has taken up plantation of 1,50,000 saplings / year in various locations of Visakhapatnam under Green Visakha program initiated by the Parliamentary Standing Committee on Science & Technology, Environment & Forests. Plantation is being carried out by Social Forestry Division. 4,50,000 saplings planted till date.
- 8) Final report has been submitted by IISc in March 2016 with general conclusion saying that "the Ambient Air Quality in Visakhapatnam city is better than many of towns of similar population and metros. Though the Air emissions in Visakhapatnam were within the stipulated limits, at the time of odour problem, the climate prevailing in winter causing temperature inversion could have created the odour issue."

WHEREAS vide reference 4th cited, the hearing was conducted before the External Advisory Committee (Task Force) Meeting of A.P. Pollution Control Board on 16.09.2016. The



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A.P. POLLUTION CONTROL BOARD
REGIONAL OFFICE

representatives of the industry attended the legal hearing. The committee noted that there are so many complaints are being lodged by the public regarding smell nuisance and the non-compliance of CFO order conditions and the directions of the Board. The representative of the industry informed that flare stacks are adequately designed. They informed odour in ETPs can be due to the aerobic reactions occurring in the bio-reactor, which plays a major role in treatment of the effluents towards reducing the pollutants. However, it is to be noted that such odour is localized and there is absolutely no chance for any odourous compounds getting carried over beyond the refinery boundary. It was also informed that they are constructing STP for treatment of domestic effluents, which will be completed by March'2017. They informed that the fuels used in the refinery are Low Sulphur Heavy Stock (LSHS), desulphurized Fuel Gas and Naphtha. Dedicated storage tanks are available for the low Sulphur liquid fuels from where fuel will be supplied to all furnaces/boilers. The fuel quantity as well as quality from the dedicated tanks are monitored and controlled. Emissions from the refinery are regularly being monitored and are within the stipulated limits. They informed that FGD-I & FGD-II have been commissioned and they are in continuous operation. The SPM emissions from the refinery are within the stipulated limit. They will develop the green belt by end of this year and finally the management will take up the all pollution control measures so as to comply with Board directions. The Committee recommended to direct the industry to monitor the additional parameters viz., Benzene, Toluene & Xylene in the CAAQM Stations.

The Committee after detailed discussions recommended to issue the following directions:

1. *The industry shall construct STP for treatment of domestic effluents within 4 months.*
2. *The industry shall explore the possibility of using treated sewage water from nearest GVMC STP for the reduction of fresh water consumption.*
3. *The industry shall explore the possibility of using low sulphur fuels for heating purposes.*
4. *The industry shall monitor the additional parameters viz., Benzene, Toluene & Xylene in the CAAQM Stations.*
5. *The industry shall develop the thick green belt around the boundary of the factory premises.*
6. *The flare stack shall be improved to flare off all hydrocarbons duly ensuring complete combustion without black smoke.*
7. *The industry shall ensure the validity CFO of the Board and ensure continuous compliance of the conditions issued by the Board.*
8. *The industry shall comply with the green Visaka targets.*
9. *The industry shall Take Necessary measures for control of smell nuisance.*

This order is issued under Sec.33(A) of Water (Prevention and Control of Pollution) Amendment Act, 1988 and under Sec.31(A) of Air (Prevention & Control of Pollution) Amendment Act, 1987.

You are hereby directed to note that, should you violate any one of the directions mentioned above, your unit will be closed under Sec.33(A) of Water (Prevention & Control of Pollution) Amendment Act, 1988 and Sec.31(A) of Air (Prevention & Control of Pollution) Amendment Act, 1987 without any further notice, in the interest of Public Health and Environment.

This Order comes into effect from today i.e., 03.10.2016.

Sd/-
MEMBER SECRETARY

To
M/s. Hindustan Petroleum Corporation Ltd.,
(Visakh Refinery)
Matkapuram,
Visakhapatnam.

Copy to:

1. The Chief Environmental Engineer, A.P. Pollution Control Board, Visakhapatnam for information and necessary action.
2. The Joint Chief Environmental Engineer, A.P. Pollution Control Board, Zonal Office, Visakhapatnam for information and necessary action.
3. The Environmental Engineer, A.P. Pollution Control Board, Regional Office, Visakhapatnam for information and necessary action.

// T.C.F.B.O //

JOINT CHIEF ENVIRONMENTAL ENGINEER
UH-II

PUBLIC INFORMATION OFFICER
A.P. POLLUTION CONTROL BOARD
REGIONAL OFFICE
VISAKHAPATNAM



Order No. 702/APP/PCB/UH-II/TF/VSP/2020-

Date:19.03.2020.

DIRECTIONS

Sub: PCB - TF-HO - M/s. Hindustan Petroleum Corporation Ltd., (Visakh Refinery & DHT Plant), Malkapuram, Visakhapatnam District – Non-Compliance of Board Directions - Legal hearing held on 04.03.2020 – Directions – Issued – Reg.

Ref: 1. Consent Order No: APPCB/VSP/VSP-72/CFO/2016, dt.18.12.2019 valid upto 31.12.2020.
2. Inspection of the industry by Board officials on 25.02.2020.
3. External Advisory Committee (Task Force) Meeting held on 04.03.2020.

Whereas you are operating the Petroleum Refinery in the name & style of M/s. Hindustan Petroleum Corporation Ltd., (Visakha Refinery) is located at Malkapuram, Visakhapatnam District.

Whereas vide reference 1st cited, the Board has issued Consent for Operation & Hazardous Waste Authorization order to the industry vide order dated 18.12.2019 valid up to 31.12.2020 for production of Diesel(Euro-VI), Gasoline, SKO, ATF, LPG etc.,

Whereas vide reference 2nd cited, the Board officials inspected the industry on 25.02.2020 and observed the followings:

1. Expansion works are in progress.
2. The effluent being discharged from the two sources i.e from ETP-I and ETP-IV are not meeting the board standards. At the time of inspection samples were collected from the outlet of the ETP-I and ETP-II.
3. The ETP I Outlet is having BOD of 20 mg/l against standard of 15 mg/l, sulphides 1.8 mg/l against standard of 0.5 mg/l .
4. ETP-IV having BOD of 16 mg/l against standard of 15 mg/l and TSS 27 mg/l against standard of 20 mg/l .
5. Oil traces are letting in to Megadrigadda surplus channel finally into sea at Naval dock yard channel.
6. Online monitoring values of Stack are exceeding the Board standards and exceedance notices have been served to the industry.
7. Frequent complaints are received against odour nuisance in the city and from the Naval Colony.
8. The industry shall monitor the odor nuisance substances like Di-Methyl amines, Di-Ethyl amines, H₂S and Mercaptance and petroleum hydrocarbons leakages with NABL accredited labs and shall take necessary measure for control of odor nuisance.
9. Frequent Black smoke is observed through flare stacks.
10. HPCI shall comply with the CPCB directions and guidelines issued regarding performance of the calibration of on line monitoring system once in 6 months.
11. The industry shall construct sheds for the storage of hazardous waste. A sample was collected from the internal drain near slop oil tank which is having oil & Grease of 6.2 ppm against 10 ppm, PH 4.89 against 6.5 -8.5 , TSS 415 against 20 mg/l, COD 172 mg/l against 125 mg/l, the BOD 48 mg/l against 15 mg/l.
12. As per the CFO, the cooling blowdown of 2,18,286 KLd is permitted for disposal into Megadrigadda surplus course finally joining to sea, after treatment.
13. During the inspection , cooling Tower outlet(2 nos) are collected and oil& Grease is exceeding (2.6 ppm and 3.2 ppm)the standard (1 PPM).

14. The AAQ was conducted at three places and PM10 is 113 µg/m³ against the standard of 100 µg/m³.
15. From the consolidated analysis reports (Jan 2019 to Dec 2019) of ETP-I outlet (DMF outlet) the BOD, Nickel and lead exceeded the standards multiple times and the Hexavalent Chromium and Mercury exceeded one time.
16. From the consolidated analysis reports (Jan 2019 to Dec 2019) of ETP-I outlet (Cooling tower) the TSS, BOD, phosphates, nickel, copper, Nickel and lead Mercury one time.
17. From the consolidated analysis reports (Jan 2019 to Dec 2019) of ETP-IV outlet (DMF outlet) the Ph BOD, COD, Copper Hexavalent Chromium and lead exceeded the standards.
18. The industry has provided online connectivity to all the 36 stacks. From 01.09.2019 to 29.02.2020, considering all the parameters the values have exceeded 644 times.

Whereas vide reference 3rd cited, legal hearing was conducted before the External Advisory Committee (Task Force) Meeting of A.P. Pollution Control Board on 04.03.2020. The representatives of the industry have attended the legal hearing and submitted that they are meeting ETP outlet standards and informed that the incidences of odorous emissions are sporadic and the increase in SPM during the monitoring is due to ongoing construction activity.

The Committee, after detailed discussions, recommended to issue the following directions. The Board hereby issue the following directions under Sec.33 (A) of Water (Prevention and Control of Pollution) Amendment Act, 1988 and under Sec.31 (A) of Air (Prevention & Control of Pollution) Amendment Act, 1987:

- 1. The industry shall carry out the study by reputed institute like IIT regarding the odour issue.**
- 2. The industry shall ensure that reduced sulphur compounds and other odorous compound emissions are within odour detection threshold.**
- 3. The industry shall carry out the Leak Detection and Repair Program (LDAR) at the specified regular intervals to identify the emission of VOCs, Volatile Hazardous Air pollutants from any leaking equipment, process equipment, etc preferably every month and the records shall be submitted to the APPCB officials during inspection.**
- 4. VOCs shall be monitored at vulnerable locations periodically inside the plant. The sporadic odorous emissions shall also be placed on record and necessary measures to stop reoccurrences shall be taken.**
- 5. The industry shall ensure that odorous compounds in Merox unit are within odour detection threshold at minute levels.**
- 6. Gas detection systems shall be in place to detect process leakages.**
- 7. The industry shall operate the ETP-I, ETP-II and ETP- IV continuously to ensure that the outlet of each meet the discharge standards as stipulated in the CFO. The industry shall ensure that treated process water, Treated cooling tower blow down joining the Meghadrigadda shall meet the discharge standards including the heavy metals.**
- 8. The industry shall ensure that values of parameters of Online Stack monitoring systems are within the Board standards.**
- 9. The industry shall ensure that values of continuous Ambient Air Quality Monitoring (CAAQM) station are within the standards.**
- 10. The industry shall submit their preparedness plan for the use of low Sulphur fuels in case of bad weather conditions.**
- 11. The industry shall comply with CFO conditions.**
- 12. The contaminated storm water shall not be let outside the industry premises.**
- 13. The preventive maintenance of VOC condensers shall be taken up at regular intervals.**
- 14. The industry shall submit BG of Rs.64 Lakhs towards the compliance of above directions within 15 days for valid of one year.**

You are hereby directed to note that, should you violate any one of the directions mentioned above, your unit will be closed under Sec.33 (A) of Water (Prevention & Control of Pollution) Amendment Act, 1988 and Sec.31 (A) of Air (Prevention & Control of Pollution) Amendment Act, 1987 without any further notice, in the interest of Public Health and Environment.

This Order comes into effect from today i.e., 19.03.2020.

**Sd/-
MEMBER SECRETARY**

**To
M/s. Hindustan Petroleum Corporation Ltd.,
(Visakh Refinery & DHT Plant), Malkapuram,
Visakhapatnam District.**

Copy to:

1. The Joint Chief Environmental Engineer, ZO, Visakhapatnam for information for information and necessary action.
2. The Environmental Engineer, Regional Office, Visakhapatnam for information and necessary action.

//T.C.F.B.O. //

**JOINT CHIEF ENVIRONMENTAL ENGINEER
UH-II**