

**BEFORE THE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE, CHENNAI**

*(Through Video Conference)*

**Original Application No.73 of 2021 (SZ)**

IN THE MATTER OF

**Visakha Pawan Praja Karmika Sangam,**

A Registered Labour Association No. 799 of 2016,  
Rep by its Secretary Mr. Ganga Raju Kola,  
H. No. 60-33-49, Ambedkar Colony,  
Maikapuram, Vishakhapatnam,  
Andhra Pradesh- 53001.

...Applicant(s)

**Versus**

**1. Union of India**

Rep by its Secretary,  
Ministry of Environment, Forest and Climate Change,  
Indira Paryavaran Bhavan,  
Jorbagh, New Delhi- 110003

**2. Union of India**

Rep by its Secretary,  
Ministry of Petroleum and Natural Gas,  
Sashtri Bhavan, New Delhi-1

**3. Central Pollution Control**

Rep by its Chairman,  
Parivesh Bhavan,  
East Arjun Vihar, New Delhi- 110032

**4. State of Andhra Pradesh**

Rep by its Chief Secretary,  
Government Complex,  
Velagapudi, Guntur District,  
Andhra Pradesh- 522503

**5. Andhra Pradesh Pollution Control Board**

Rep by its Members Secretary,  
D. No. 33-26-14/D2,  
Near Sunrise Hospital, Pusha Hotel Center,  
Chalamvari Street, Kasturibaipet,  
Vijayawada, Andhra Pradesh- 520010.

**6. District Collector and Magistrate**

Main Road, Krishna Nagar,  
Maharani Peta, Vishakhapatanam,  
Andhra Pradesh- 530002.

**7. M/s Hindustan Petroleum Corporation Limited.**

Rep by its Chairman and Managing Director,  
Malkapuram Post, Vishakhapatnam,  
Andhra Pradesh- 530011.

...Respondent(s)

For Applicant(s): Mr. Sravan Kumar.  
For Respondent(s): Mr. G.M. Syed Nurullah Sheriff for R1.  
Mr. A.R. Sakthivel for R2.  
Mrs. MadhuriDonti Reddy for R4 to R6.  
M/s. King & Partridge for R7.

**Judgment Reserved on: 26<sup>th</sup> August, 2022.**

**Judgment Pronounced on: 20<sup>th</sup> October, 2022.**

**CORAM:**

**HON'BLE Smt. JUSTICE PUSHPA SATHYANARAYANA, JUDICIAL MEMBER**

**HON'BLE Shri. SAIBAL DASGUPTA, EXPERT MEMBER**

**JUDGMENT**

***Delivered by Justice Smt. Pushpa Sathyanarayana, Judicial Member***

- 1.** The applicant is challenging the activities of Hindustan Petroleum Corporation Limited (for short 'HPCL') as they are violative of the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Biodiversity Act and also the direction issued by the Andhra Pradesh Pollution Control Board and the conditions imposed by the MoEF&CC.
- 2.** As the authorities, namely, MoEF&CC, the Andhra Pradesh Pollution Control Board and the CRZ have not taken any action against the 'HPCL' which is the 7<sup>th</sup> respondent, the above application is filed seeking a Committee to be appointed consisting of experts from the Pollution Control Board to conduct a site inspection and get factual findings and also assess air and water pollution etc., and direct the 7<sup>th</sup> respondent to implement the recommendations of the Indian Institute of Science, Bangalore with respect to the odour nuisance caused in Visakhapatnam.

- 3.** The 7<sup>th</sup> respondent refinery was established in Visakhapatnam in the year 1957 and the capacity of the plant was increased from 0.65 MMTPA to 8.3MMTPA in the course of time. The industry has been causing smoke, odour nuisance and water pollution for several years. This has resulted in inconvenience and health hazards to the residents of the area. The local residents have made several complaints and given representation to the authorities on the pollution caused by the refinery. In response to those complaints, the Andhra Pradesh Pollution Control Board had also conducted several inspections in the unit and found large number of deficiencies and directed the unit to take precautions.
- 4.** It is further alleged that the bad smell that emanates from the 'HPCL' plant creates nausea, breathlessness, lung, heart, eye and skin diseases to the residents, particularly to the women, children and elderly people. It is alleged that the water samples tested by the Public Health lab confirmed that the ground water was severely contaminated due to untreated water discharge from the industry. The Indian Institute of Science, Bangalore also had made certain recommendations regarding the odour pollution.
- 5.** It is pointed out that the MoEF&CC compliance report found violation in the unit that the mandatory green belt of 33% in the unit was not developed. The conclusion of the monitoring report also stated that the capacity of the unit must be reduced to 70% of the original capacity. In the year 2017, the unit had proposed to extend its capacity from 8.5 MMTPA to 15 MMTPA. Several representations given to the authorities, requesting not to expand the capacity of the unit. Andhra Pradesh Pollution Control Board also conducted an inspection and issued directions on the violations noticed in the unit including directing the unit to submit a bank guarantee of Rs. 64 lakh.
- 6.** It is now complained by the applicant that even the recommendations of the Indian Institute of Science, Bangalore was not implemented. Even during pendency of the application, a major accident occurred due to lack of requisite mandatory maintenance of the plant. On the directions of the Tribunal, a Joint Committee was constituted who had inspected and filed a report. It was recommended that the unit has to pay Rs.24,36,696/- (Rupees Twenty Four Lakhs Thirty Six Thousand Six Hundred and Ninety Six only) as environmental compensation. The

Joint Committee also confirmed the violations raised by the applicant like odour, lack of maintaining 33% of green belt etc. Therefore, the applicant had sought for the above directions in the application.

- 7. The 1<sup>st</sup> respondent, which is the Ministry of Environment, Forests and Climate Change** has filed its counter affidavit stating that apart from causing odour pollution, there are lot of violations committed in respect of the conditions imposed in the Environmental Clearance granted by them as well as the 'consent to operate' granted by the Pollution Control Board. The operation of the unit with the said violations resulted in serious environmental degradation. As the MoEF&CC is engaged only in policy formulation for abatement, control and prevention of pollution prescribing the environmental standards and they are implemented only through the Central Pollution Control Board and State Pollution Control Board, who are the enforcement authorities. The Pollution Control Boards or the Pollution Control Committees are empowered to take all such measures expedient for the purpose of protection and implementing the quality of the environment as well as prevention.
- 8. The 3<sup>rd</sup> respondent, who is the Central Pollution Control Board,** has filed its reply stating that the Environment Impact Assessment, Notification mandates the requirement of prior Environmental Clearance to the project listed in the schedule of the said notification. The Environmental Clearance is granted to the project proponent by the MoEF&CC under the said notification and they are also monitored periodically.
- 9.** It is alleged that for grant of Environmental Clearance for expansion to the 7<sup>th</sup> respondent, 'HPCL' the public hearing was not conducted when there were various complaints made by the applicant-Association and others regarding the functioning of the 7<sup>th</sup> respondent. Already Indian Institute of Science, Bangalore has submitted its report on odour nuisance and submitted a report to the State Pollution Control Board regarding the marine pollution. There are already the conditions and precautions for preservation and protection of the marine environment published by the Indian Coast Guard. The applicant had alleged that the 7<sup>th</sup> respondent is discharging the untreated water into the sea causing water pollution which has to be addressed only by the State Pollution Control Board.

**10. The State Pollution Control Board, who is the 5<sup>th</sup> respondent,** had in its report stated that a report was called for from it regarding the accident that took place on 25.05.2021 in the 7<sup>th</sup> respondent unit. The total area of the unit is about 1880 acres which was leased from the Visakhapatnam. The 7<sup>th</sup> respondent, 'HPCL' is surrounded by various other industries on all the four sides and the green belt developed in the unit is about 45 acres and in an addition the industry has planted about 06 lakh saplings in Greater Visakhapatnam Municipal Corporation limits.

**11.** The industry was issued with 'Consent for Operation' and hazardous waste authorization by the Board on 09.03.2021 which has got the capacity of 10 million metric ton per annum of crude oil. There was an accident on 25.05.2021 and Andhra Pradesh Pollution Control Board had inspected the site along with the scientific staff of the zonal lab, Vishakhapatnam and monitored the ambient air quality and submitted the monitoring report. It is also observed that contaminated waste water was generated due to fire fighting, sea cooling water is used in the fire water network and the fire water used for fire fighting operations collected in surface drains was routed to effluent treatment plant for treatment along with other waste waters. Water samples were collected during fire fighting operations from the drain where analysed and a report was given by the State Pollution Control Board. The industry was also directed to dispose of the oily sludge generated during fire incident to authorised agencies/treatment storage disposal facility for safe disposal.

**12.** The 7<sup>th</sup> respondent had also 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 the 7<sup>th</sup> respondent to the Andhra Pradesh Pollution Control Board about Rs. 25 Crore worth of works have been undertaken immediately to replace the pipelines and machinery and about 78 metric ton of hydrocarbon was burnt in the fire accident

**13. The 6<sup>th</sup> respondent, who is the District Collector and Magistrate,** also had constituted a Committee on the date of accident and a copy of proceedings was also issued. As per the proceedings, the Committee to enquire and submit a report to find out the cause of

outbreak of fire in the factory, whether sufficient measures have been taken by the management of the factory, whether any negligence or lapses are noticed in avoiding the mishap on the part of the management and whether any departmental failure is noticed were to be discreetly enquired and submitted.

**14. The report submitted by the Enquiry Committee constituted** by the District Collector and District Magistrate was also submitted to the Andhra Pradesh Pollution Control Board. The report also had identified the lapses and had given the recommendations to the unit to avoid such incidents in future.

**15. The 7<sup>th</sup> respondent, who is the refinery unit,** had filed its reply through its Dy. General Manager-Technical. The 7<sup>th</sup> respondent has specifically stated that it has got the name plate capacity of 8.33 Million Metric Tonnes and also a valid 'Consent for Operation' for 10 MMTPA. But the refinery is operating only in the range of 09 to 9.78 MMTPA. The refinery also had obtained all the necessary environmental consents to operate its refinery and complies with conditions imposed upon it by the environmental authorities. A very detailed reply is filed by the refinery unit setting out in detail the response for all the allegations made in the application.

**16.** The refinery unit/7<sup>th</sup> respondent also filed its objection to the Joint Committee report dated 03.12.2021 and reply to the allegations dated 03.10.2021 with respect to the Joint Committee report dated 23.02.2022. There is yet another objection to the report of the Joint committee dated 17.06.2021 filed by the refinery on 16.09.2021.

**17.** The Learned Counsel appearing for the refinery unit confined his argument only with the following issues, namely, (i) provision of 33% of the green belt, (ii) odour nuisance and (iii) the fire accident.

**Odour Nuisance:**

**18.** Pursuant to the complaints received from public of odour problems from several parts of Vizag City, Andhra Pradesh Pollution Control Board (APPCB) and District Administration of Vizag engaged IISC Bangalore to identify the root cause of odour nuisance. The major observation of the IISC is that the compounds responsible for odour

problem in Vizag City could be the cumulative effect of odorous organic and inorganic like unburnt hydrocarbons, BTX solvents, sulphides, amino compounds etc. from the industrial establishment, domestic sewage, municipal solid waste and vehicular exhausts and it is difficult to pinpoint any one industry. Thus the IISC had recommended the following measures for mitigating the pollution from the industries:

*"i. Even if industries follow good practices and maintain crisis 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 order problem in Visakhapatnam area.*

*ii. APPCB being the model 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 nominate to inform all members about the complaint 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 wherever odor is experienced.*

*v. Public education is an important concept in odor management. The odor squad should strive to impress upon people of Visakhapatnem that the common odor 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 regarding proper education."*

**19.** The Joint Committee had observed that the unit had not provided closed collection system to handle the odorous effluent streams. The oil-water separators and equalization tanks are not covered to trap the VOCs. Hence there was a strong odour of VOCs sensed in the ETP I & IV near bio-remediation ponds.

**20.** However, the 7<sup>th</sup> respondent had replied that the odour was localised and intermittent and it was not felt beyond ETP area. VOC recovery system is being implemented in the IETP as part of VRMP which is under mechanical completion stage. The existing ETPs will be non-operational post commissioning of IETP.

- 21.** In its reply, the 7<sup>th</sup> respondent has stated that a purchase order has been placed by the respondent on M/s. Glens Innovation Labs Private limited, Chennai for conducting odour study at the 7<sup>th</sup> respondent refinery which will be reviewed and vetted by IIT Madras and that the work will commence in April 2021. The status of the same is not furnished by the 7<sup>th</sup> respondent.
- 22.** A brief compliance report was also furnished by the refinery unit in which it is stated that despite following good practices and maintaining the emissions within the limits, there are possibilities of episodic odour issues. In such cases, it is the responsibility of the unit to cooperate and participate in tackling the odour problem. It is admitted by the 'HPCL' that checks were carried out inside the refinery and no abnormalities were observed and it was promptly communicated to the complainants and the authorities as applicable. It is also stated that an odour squad comprising members from Andhra Pradesh Pollution Control Board and stakeholders from the industry and prominent community members and experts in environmental area were constituted. The squad would visit the site and take air samples in Tedier bags which would be stored under appropriate conditions and transported to a recognised lab. The unit has stated that as and when complaints were received, the plants were checked for any abnormality and no abnormalities were found. As per the odour squad's recommendation the use of respiratory masks are encouraged.
- 23.** Though the smell from the industries may not have any serious impact on an average person health, the public also should be properly educated on the same as per the recommendation of the odour squad.
- 24.** Albeit, odour control is a major issue in any oil refinery as there is plenty of scope for unpleasant emissions which are inevitable. The 7<sup>th</sup> respondent refinery is a large scale refinery having the potential to generate odour that can be detected over large distances requiring a high performance odour control measures to minimize the odour impact. The odour impact besides being annoying also impacts the health. Stable petrochemical production may be associated with low but long-term exposure to industrial emissions. Nevertheless, accidents in the plants, such as the one happened in this case may temporarily cause high level of exposure in the population living near the plants.

**25.**The APPCB in its observation has not specified any well defined sources for the odour:-

*"a. The unit is not complying with the majority of conditions stipulated in Environmental Clearances granted to Visakha Refinery.*

*b. The unit is not complying with the majority of consent & authorization conditions issued by APPCB on March 9, 2021; these are the same conditions given by APPCB at the time of consent & authorization 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 emission 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, PM2.5 parameter is exceeding at all the five locations, at one point near the ETP-IV area the concentration value of SO<sub>2</sub> 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 efficiency & 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 has to ensure self-monitoring, self-compliance and comply with statutory guidelines, safety measures, and directions issued by MOEF & CC, CPCS, APPCB, Directorate of Factories and other Regulatory Authorities.*

*i. The sulfur content in the crude oil is found to be less than the sulfur content in the all products."*

**26.**From the above report of the APPCB, it can be inferred that most of the odours encountered during the observations were due to normal operations and diffuse emissions.

**27.**To ascertain the source of pollution, the Joint Committee along with the scientist of APPCB Zonal Laboratory carried out Ambient Air Quality Monitoring at 5 locations (Manual monitoring at 3 locations and Mobile van with CAAQMS at 2 locations) in and around the industrial premises.

***"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
<b>I Manual Stations</b>					
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 <sub>2</sub> , NO <sub>2</sub> & NH <sub>3</sub> .
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		
<b>II Mobile Continuous Ambient Air Quality Monitoring Station (CAAQMS)</b>					
1	North-west corner of the industry near ETP - 4	17.700329	83.237126	25.03.2021 and 26.03.2021	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , NH <sub>3</sub> , O <sub>3</sub> , 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 PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, NH<sub>3</sub>, O<sub>3</sub>, 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 <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	NH <sub>3</sub>	O <sub>3</sub>	CO	Benzene
<b>I Manual Stations</b>									
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	-	-	-
<b>II Mobile Continuous Ambient Air Quality Monitoring Station (CAAQMS)</b>									
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 hours)	4 (1 hour)	-
Annual average standard		60	40	50	40	100	180 (1)	2 (8)	5

						hour)	hours	
All values are expressed in $\mu\text{g}/\text{m}^3$ , except CO. CO values are expressed in $\text{mg}/\text{m}^3$ .								
Analysis result of other 49 VOCs is annexed (Annexure – 16).								

The results show that the values of  $\text{PM}_{10}$  &  $\text{PM}_{2.5}$  values are exceeding the 24 hour average standards. The  $\text{SO}_2$  value at the North-west corner of the industry near ETP – 4 is exceeding the standard. The values of  $\text{SO}_2$  &  $\text{NO}_x$ , 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,  $\text{PM}_{10}$ ,  $\text{PM}_{2.5}$ ,  $\text{SO}_2$ ,  $\text{NO}_x$ , etc. are find their way into the ambient air as fugitive emissions. Higher values of  $\text{PM}_{10}$  &  $\text{PM}_{2.5}$  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  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  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  $\text{SO}_2$  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	$\text{PM}_{10}$	$\text{PM}_{2.5}$	$\text{SO}_2$	$\text{NO}_2$	$\text{NH}_3$	$\text{O}_3$	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 $\text{mg}/\text{m}^3$ .									
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.

28.Regarding emissions of stacks, the report of the committee is as follows:

**"5.1 Monitoring of emission in stacks**

Committee carried out monitoring of flue gas emissions from five important stacks for PM, SO<sub>2</sub> and NO<sub>x</sub> 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/N M3)	Standard
1	Stack attached to DHDS Reformer-61F11	25.03.2021	PM	39.0	100
			SO <sub>2</sub>	63.5	--
			NO <sub>x</sub>	35.7	--
2	Stack attached to combined feed heater and product fractionators reboilers-90F01, 90F02	26.03.2021	PM	24.9	100
			SO <sub>2</sub>	184.7	--
			NO <sub>x</sub>	204.9	--
3	Stack attached to Flue gas desulphurization unit FGD-II	26.03.2021	PM	36.0	50
			SO <sub>2</sub>	147.5	--
			NO <sub>x</sub>	112.8	--
4	Stack attached to continuous catalytic reforming unit (CCR) 74F1, F2, F3, F4	26.03.2021	PM	22.0	100
			SO <sub>2</sub>	25.1	--
			NO <sub>x</sub>	117.4	--
5	Stack attached SRU Train - III Incinerator 79F302	27.03.2021	PM	23.0	100
			SO <sub>2</sub>	32.5	--
			NO <sub>x</sub>	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 (SO<sub>2</sub>), Nitrogen dioxide (NO<sub>2</sub>) 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, SO<sub>2</sub>, NO<sub>x</sub>& hydrocarbons. The Joint Committee calculated pollutant emission load for compliance verification as tabulated below.

**Table 8: Emission Load calculation statement for PM, SO<sub>2</sub> and NO<sub>x</sub> 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 <sub>x</sub> (TPD)	SO <sub>2</sub> (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_1_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_REFORM ER-	NA	0.042	0.054
19	Stack 20	Stack19_DHDS_HGU_61F 1	NA	NA	NA
20	Stack 22	Stack20_DHDS_SRU_65F 001-	NA	0.02	0.042
21	Stack 26	Stack21_DHDS_SRU_79F 302-	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_90F 01_02-	0.054	0.092	0.138
30	Stack 32	Stack_30_DHT_HGU_NAP THA_HEATER_91F01-	0	0.002	0.001
31	Stack 31	Stack_31_DHT_HGU_91M 20-	0.063	0.079	0.071
32	Stack 33	Stack_32_DHT_SRU_92M 22-	0.004	0.018	0.051
<b>Total (as calculated from the results obtained from CEMS connected to 32 stacks)</b>			<b>0.969</b>	<b>5.083</b>	<b>4.521</b>
<b>Total emission load (as stipulated to each stack in the CFO Order against the 32 stacks)</b>			<b>5.609</b>	---	---
<b>Total emission load (as stipulated to each stack in the CFO Order against all the 36 stacks)</b>			<b>6.72</b>	---	---
<b>Total emission load prescribed as per CFO Order</b>			<b>1.11</b>	<b>6.5</b>	<b>11.5</b>
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, SO<sub>2</sub> and NO<sub>2</sub> are meeting the prescribed standard for pollution emission loads."

**29.**As far as the waste water generation and treatment is concerned, there are three Effluent Treatment Plants in HPCL. Treatment 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 of Bay of Bengal.

**30.**During inspection, the Joint Committee collected treated effluents from three outlets of ETPs and the two final outlets discharged into Megadrigedda surplus overflow channel for compliance verification on 26.03.2021.

**31.**The Joint Committee had done the **domestic waste water** treatment analysis and observed that all the parameters are meeting the standards.

**Groundwater Quality Monitoring:**

*"HPCL has installed six piezometer wells inside the unit premises to regularly monitor the groundwater quality. During the inspection, it was informed to the committee that four of the wells are dried up and the Joint Committee collected groundwater samples from two piezometer wells located within the industry premises.*

*Results shows that dissolved solids content in the groundwater 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."*

**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).*

*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 sulphur content have also been verified by the Joint Committee while carrying out sulphur balance studies.*

*From the analysis 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."*

**32.**After the above analysis, the Joint Committee has observed as follows:-

**"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 m<sup>3</sup> 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 100m<sup>3</sup> of each is constructed and filled with low oil sludge, the oil zapper bacteria at 5 kgs/m<sup>3</sup> and nutrients of 250g/m<sup>3</sup> 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., SO<sub>2</sub>, NO<sub>x</sub>, 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 compliancereports.

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 authorization 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 PM<sub>10</sub> & PM<sub>2.5</sub> 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, SO<sub>2</sub>, NO<sub>x</sub> & 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 practices 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, PM2.5 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."

**33.**Therefore, the 7<sup>th</sup> respondent has decided to follow the specific directions recommended by the EAC (Expert Advisory Committee) to comply with the same.

#### **Greenbelt:**

**34.**Vegetation around the industry or the greenbelt is to mitigate the air pollution as the plants serve as a sink for pollutants and also reduce noise level. Greenbelt development is beneficial in several ways leading in conservation of bio-diversity, retention of soil moisture, recharge of groundwater, improving aesthetics of local environment and maintaining pleasant atmosphere of the region.

**35.**It would be relevant to advert to the order passed by the Hon'ble High Court of Andhra Pradesh in **W.P. No.259 of 2017** dated 23.09.2019 wherein a direction was given to the HPCL to comply with the CFO conditions including the recommendations of Andhra Pradesh Pollution Control Board (APPCB) of its report dated 25.04.2019 and further directing the Board to monitor the refinery and take appropriate action if necessary. In the said order, the Andhra Pradesh Pollution Control Board (APPCB) had recommended that besides the completion of plantation of 6,50,000 saplings, there was further scope for development of greenbelt in the vacant areas.

*"The Board has stipulated Load based standards for the stack emissions. Whereas the Industry is measuring the emissions for concentrations. But the industry is generating load based data randomly duly taking volumetric flow data from third party monitored reports. The industry may be recommended to develop a methodology to correlate the concentration based result to convert to load based values to verify the compliance.*

*The industry may be recommended to improve housekeeping near ETP-IV.*

*The industry may be recommended to store used chemical drums in closed sheds.*

***There is further scope for development of Green Belt in the vacant areas.***

*There is scope for improvement of Bio-remediation pond management as certain spillages on ground were observed.*

*The industry may be recommended to comply with CFO conditions."*

**36.**Condition No. 16 of Schedule - B of the CFE Expansion Order dated 06.07.2016 speaks about the greenbelt:

*"the total area of the industry after expansion is 860 acres. Green belt is existing in an area of 45.0 acres. The area of the green belt after expansion is 112.5 acres. The industry vide mail dt. 06.07.2016 informed that being a brown field project, there is no adequate space available within the refinery for provision of additional green belt. Further, plantation of trees is not recommended inside the plant area due to safety considerations and development of green belt along the boundary is prohibited considering the associated security risk. The industry under "Green Visakha Programme" about 4,50,000 saplings were planted till 2015. Additional plantation of 2,00,000 saplings is to be undertaken up and completed during 2016-17. The major areas of plantation are Autonagar, Vadlapudi, Parawada, Sheelanagar, Aganampudi, Denkada etc., and the total acreage of block plantation in these areas is approximately 700 acres."*

**37.**From the above it appears that the industry had complied with the greenbelt requirement.

**38.**Development of greenbelt consisting of 3 tier along the periphery of the project with native species is most important guideline for any type of industry. Green vegetation cover is beneficial in many ways leading to conservation of bio-diversity. The greenbelt species should be selected based on the type/category of the industry and climate conditions. Setting trees around an industry may not serve the purpose of greenbelt without considering the above aspects.

**39.**Therefore, the APPCB may consult the Andhra Pradesh Forest Department and NEERI in this regard for the delineation of the optimal width of a greenbelt in and around the industry based on pollution attenuation coefficient of selected place species. The 7<sup>th</sup> respondent may consider contributing to the greenery of the Vizag city.

## **Fire Accident:**

**40.** It is not a secret that an oil refinery or petroleum product industry is a dangerous job. There is always something that could go wrong. One of the serious risks in these industries is the potential for fire and explosions. It is therefore important to conduct fire risk assessment. The management also put in place several rules and practices and train the employees how to recognize the hazards.

**41.** On 25.05.2021, there was a fire accident at Crude Distillation Unit III of the 7<sup>th</sup> respondent. A report was called for in this regard from Andhra Pradesh Pollution Control Board (APPCB) which was submitted along with the detailed report from the enquiry committee submitted to the Collector & District Magistrate. The cause of the outbreak was found to be the hole that developed on the 6" SR pipeline carrying Bitumen due to corrosion or erosion. The report further observed the following lapses of HPCL during inspection.

*"1. Deviation in implementing preventive maintenance schedules as per the Standard Operating Procedures (SOP) within the time. During inspection, it was observed that industry was not conducted the Ultra sonic test for 6 inch pipeline in CDU-3 (fire incident was taken place) for which the due date for testing is August 2020.*

*2. Industry has conducted of hydro-test to the pipelines in August, 2012, and not conducted afterwards this test should be which will be conducted every 4 years which is serious lapse on account of HPCL.*

*3. Failure in identifying corrosion / erosion of the pipelines carrying hydrocarbons at higher temperatures*

*4. Preventive maintenance schedules are not implemented properly."*

**42.** The report also furnished the recommendations suggested by the committee as follows:

*"In view of the fire incident that occurred at HPCL-Visakha Refinery on 25.05.2021 at 3.10 PM the committee has suggested the following recommendations to avoid such incidents in future:*

*1. Industry shall conduct timely Hydro Testing of all pipelines for its efficacy and also shall start the Hydro testing of all pipelines of the other two crude distillation units existing in the same premises immediately by the management to avoid this type of fire incidents.*

*2. Industry shall ensure hydrant pressure of 7 kg / cm<sup>2</sup> at any point of time in the fire hydrant network*

*3. Industry shall ensure the operability of Diesel operated pump dedicated to fire hydrant network. A standby Diesel pump may be installed.*

*4. Industry shall conduct the audit of Foam availability in the plant premises regularly.*

*5. Industry shall strengthen the mutual aid agreement with the nearby industries*

6. Industry shall conduct periodical mock drills and find out any lapses in the mitigation of defined scenario.
7. Industry shall mark the flow directions on the pipelines by indicating arrow marks for easy identification.
8. Industry shall conduct HARA study and implement the recommendations therein from time to time.
9. Industry shall clear accumulated trash and scrap regularly as the industry is under expansion.
10. A detailed metallurgical / micro-structural analysis of the failed pipeline elbow to be carried out to establish the nature of failure by external qualified agency.
11. The management shall follow the directions to be issued by Hon'ble NGT in OA No. 73/2021 which is filed case on the fire incident.
12. HPCL should purchase Hydraulic platform and made it available for any fire mishaps at heights, since most of the pipeline elevated structures are upto 30 meters and above
13. Escape signage boards should be displayed in the entire premises."

**43.**The report of the HPCL / 7<sup>th</sup> respondent on CDU-3 fire accident on 25.05.2021 is as follows:-

**"2.1.1 Ambient Air Quality:**

There was no increase in the ground level concentrations of ambient air quality parameters recorded in the two of the three Continuous Ambient Air Monitoring (CAAM)stations during the fire incident. In the third CAAM station located at south gate, even though there was slight increase in NOx emissions for short duration (15:45 hrs to 16:45 hrs), the 24-hour average value was well within the stipulated limit of National Ambient Air Quality Standards (NAAQS).

Since the wind direction was predominantly towards south east during the incident, the average recorded values of the ambient air quality in CAAMS-1 (South Gate) which is located at south-east in the downwind direction during the incident are provided below:

CAAMS – 1 (South Gate)								
	Nox	So2	CO	PM 10	PM 2.5	Benzene	Ozone	NH3
	µg/m <sup>3</sup>							
Average value observed during incident	66	8	1	240	40	0.4	9	0.1
24 hour Average value (8 AM to 8 AM)	27	8	0.8	177	39	0.8	13	0.1
Stipulated limit	80	80	2	100	60	5	100	400

As can be seen from the above table, all the ambient air quality parameters were within the stipulated limits, except PM10, which has been higher before, during & after the incident due to the ongoing construction activities in the area including the approved refinery modernization project. 15-minute average data recorded in the CAAMS-1 (South Gate) from 14:00 hrs to 17:00 hrs of 25.05.2021 is provided in Annexure-I, which shows that the ambient air quality parameters were within stipulated limits

**2.1.2 Liquid Effluent**

Sea cooling water is the medium used in the fire water network of HPCL-Visakh Refinery. The fire water was mainly used to extinguish fire during the incident besides dry chemical powder (DCP) and aqueous foam. The fire water used for fire-fighting gets

collected in surface drains of CDU-3 and is routed to API separators of ETP-I (as per design) where the traces of oil (if any) will get removed. This fire water (after oil removal) along with sea water cooling tower blow down is routed back to sea through the normal outlet channel of Refinery at MHF-1 (Main Hay Filter).

The fire water samples from CDU-3 surface drain and the final outlet after treatment in the API separators were collected for analysis. The samples were analyzed by MoEF recognized third party laboratory, M/s SV Enviro Labs & Consultants, and it was found vide reports dated 15.06.2021 that the parameters of final outlet were within the stipulated limits of sea cooling water discharge. Analysis reports are provided in Annexure-II.

### **3. CONCLUSIONS**

*From the above, following inference can be drawn:*

*a) The Refinery operations are carried out as per stipulated norms. There is no violation of Consent For Operation (CFO) granted by the environmental authorities. The emissions and discharges resulting from the fire incident in CDU-3 are within the prescribed parameters.*

*b) The fire incident has not impacted the environment or surrounding habitation and the ambient air quality was within stipulated limits."*

**44.** In its objections to the Joint Committee report, the 7<sup>th</sup> respondent had stated that *"the hydrotest and other testing activities are carried out during unit shutdown period stretching about one month. During the shutdown, each equipment will be dismantled, tested and refitted and thereafter Hydro testing will be conducted. For carrying out these activities, more than 1000 workers have to be assembled and they work round the clock for about one month. In view of the Nationwide lockdown due to COVID situation prevailing during the mentioned period, the above said activities could not be taken up as a planned activity. However, the UTG (Ultrasonic Thickness Gauging) of the pipelines was initiated in 2020 and the same was in progress till the onset of the COVID lockdowns. UTG of the balance pipelines and hydro test of all the pipelines were completed during the shutdown. In addition, various established alternate testing methods such as on stream inspections (OSI), Visual Inspection (VI) and in house Remaining Life Assessment (RLA) were carried out for all hydrocarbon (HC) circuits to ensure healthiness and longevity of the pipelines."*

**45.** Regarding the environmental damage assessment for contribution of emission into atmosphere, the Joint Committee proposed to levy environmental damage compensation as per the European Union "Environmental Prices Handbook" EU 28 Version, wherein prices are expressed in Euros/kg pollutant emitted into the environment. The committee had used the document as a reference to calculate the

prices of the pollutants emitted into the environment, as the documents indicates 3 types of pricing viz., lower, central and upper, depending upon magnitude of emissions.

**46.**As the quantities of pollutants emitted were in considerable quantity, but there was no significant damage to the surrounding environment injury or casualties reported, the committee had used central limit environmental prices assigned to SO<sub>2</sub> & CO<sub>2</sub> while calculating the damages. This was objected to by the 7<sup>th</sup> respondent contending that *"The Environmental Prices Handbook (EU-28 Version) which contains the standards applicable to the European Union and does not apply to India. Furthermore, as per Clause 3.2 of the Environmental Prices Handbook (EU-28 Version) it is stated that "the damage cost of environmental pollution can vary widely according to local circumstances and nature of environmental emission. Prices make no allowance for these differences". For these reasons, these environmental prices cannot simply be applied to specific cases of environmental pollution, for pollution in other countries or for pollution by non-average emission The Joint sources. Committee appears to have failed to consider the above. Without above, prejudice is further submitted that the Joint Committee Report applies central limit environmental prices even after finding that there was no significant damage to the surrounding environment, injury or casualties reported. Hence, this methodology of estimating the compensation is not applicable. Refinery SO<sub>2</sub> emission on the day of incident (25.05.2021) was 5.6 TPD. Even after considering the SO<sub>2</sub> emissions from hydrocarbon burnt during the fire incident (which was 2.3 MT as reported by the joint committee), overall SO<sub>2</sub> emission from the Refinery was 7.9 TPD, which is less than maximum prescribed limit of 11.5 TPD. Thus, the Refinery has not exceeded the prescribed SO<sub>2</sub> emission limit. The tons CO<sub>2</sub> of equivalent emissions per ton of crude (tCO<sub>2</sub>e / MT) processed is in the range of 0.200 to 0.213 for HPCL - Visakh Refinery. The estimated increase in tCO<sub>2</sub>e / MT due to 211 MT of CO<sub>2</sub> as reported by the joint committee is 0.004 tCO<sub>2</sub>e / MT, which is insignificant. Finally, the committee observed that there is no significant damage to the surrounding environment, the environmental compensation that is linked to the damage, should not have been ascertained. HPCL denies any liability to pay any compensation."*

**47.**The 7<sup>th</sup> respondent also disputed the liability of payment of compensation.

**48.**In this regard, it is useful to refer to the report of enquiry committee on the fire accident wherein the following lapses were identified by the committee:-

**"9.0 IDENTIFICATION OF LAPSES**

*The following lapses of HPCL are observed during the inspection and document verification:*

*1. Deviation in implementing preventive maintenance schedules as per the Standard Operating Procedures (SOP) within the time. During inspection, it was observed that industry was not conducted the Ultra sonic test for 6 inch pipeline in CDU-3 (fire incident was taken place) for which the due date for testing is August 2020.*

*2. Industry has conducted of hydro-test to the pipelines in August, 2012, and not conducted afterwards this test should be which will be conducted every 4 years which is serious lapse on account of HPCL.*

*3. Failure in identifying corrosion / erosion of the pipelines carrying hydrocarbons at high temperatures*

*4. Preventive maintenance schedules are not implemented properly."*

**49.**The above report clearly indicates that the 7<sup>th</sup> respondent had admittedly not conducted hydro test after 2012, though it should have been conducted every 4 years. It is only in 2020 as admitted the Covid-19 disabled them from conducting the hydro test. There is no clear answer given by the unit in this regard.

**50.**The conspectus of the above facts based on the reports of the Joint Committee constituted by the Tribunal and the enquiry committee headed by the District Magistrate on fire accident dated 25.05.2021, the HPCL/7<sup>th</sup> respondent has complied with most of the directions issued by the APPCB, IISC - Bangalore and the Joint Committee but not completely.

**51.**In fact, the recommendations of the IISC, Bangalore were not complied with at the time of inspection of Joint Committee. The committee also found that the directions issued by APPCB for non-compliance of Consent for Operation and Consent for Establishment conditions and also for odour nuisances. The APPCB had issued directions to the unit under Section 33 (A) of the Water (Prevention and Control of Pollution) Act, 1974 and Section 31 (A) of the Air (Prevention and Control of Pollution) Act, 1981 for non-compliances

from 14.12.2011 till 19.03.2020. **Therefore, the committee observed that there were repeated violations by the unit from 2011 onwards** and decided to consider the number of violations from 2011 and recommended levying environmental compensation at Rs.8,35,20,000/ (Rupees Eight Crores Thirty Five Lakhs and Twenty Thousand only). The conclusions and recommendations of the Joint Committee are as follows:-

*"(i) The unit after expansion consists of 860 acres and 112.5 acres is used for greenbelt 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, Parawade, Sheelanagar. Aganampudi, Denkada etc.*

*(ii) The recommendations made by IISC, Bengaluru pertaining to M/s HPCL, Visakhapatnam (7 respondents) 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 and pollution matters."*

**52.** There is merit in the recommendations of the Joint Committee that HPCL had failed to take effective steps despite the long period between 2011 and 2020. HPCL being a CPSE industry carrying out public utility services has to be a model unit of compliance with the environmental norms which was unfortunately not there in this case for more than a decade.

**53.**Accordingly,

**53.1** HPCL is directed to take all the required initiative and comply with the observations of the Joint Committee, IISC – Bangalore and enquiry report within a period of six months.

**53.2** APPCB is to monitor the same and it is not debarred from taking any action against HPCL for any fresh violation under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 and also initiate appropriate action against the erring officials as per the statutes.

**53.3** HPCL is directed to deposit the Environmental Compensation assessed at **Rs.8,35,20,000/- (Rupees Eight Crores Thirty Five Lakhs and Twenty Thousand only)**forthwith.

**53.4** HPCL is directed to deposit a further sum of **Rs.10,00,00,000/- (Rupees TenCrores only)** for their wilful negligence being a PSU which can be spent on restoration of environment and public health in the district of Vizag. Such deposit to be made **within 2 (Two) months** from today to CPCB which will draw a plan to that effect.

**53.5** The Joint Committee to ensure the regular monitoring in implementing the plan.

**53.6** An independent Compliance Report may be filed by the Joint Committee after inspection as to the status of the compliance by the HPCL after 6 (Six) months i.e. by **15<sup>th</sup> May, 2023**.

**54.** Accordingly, the Original Application is disposed of. List the matter in May, 2023 for reporting compliance.

**Sd/-**

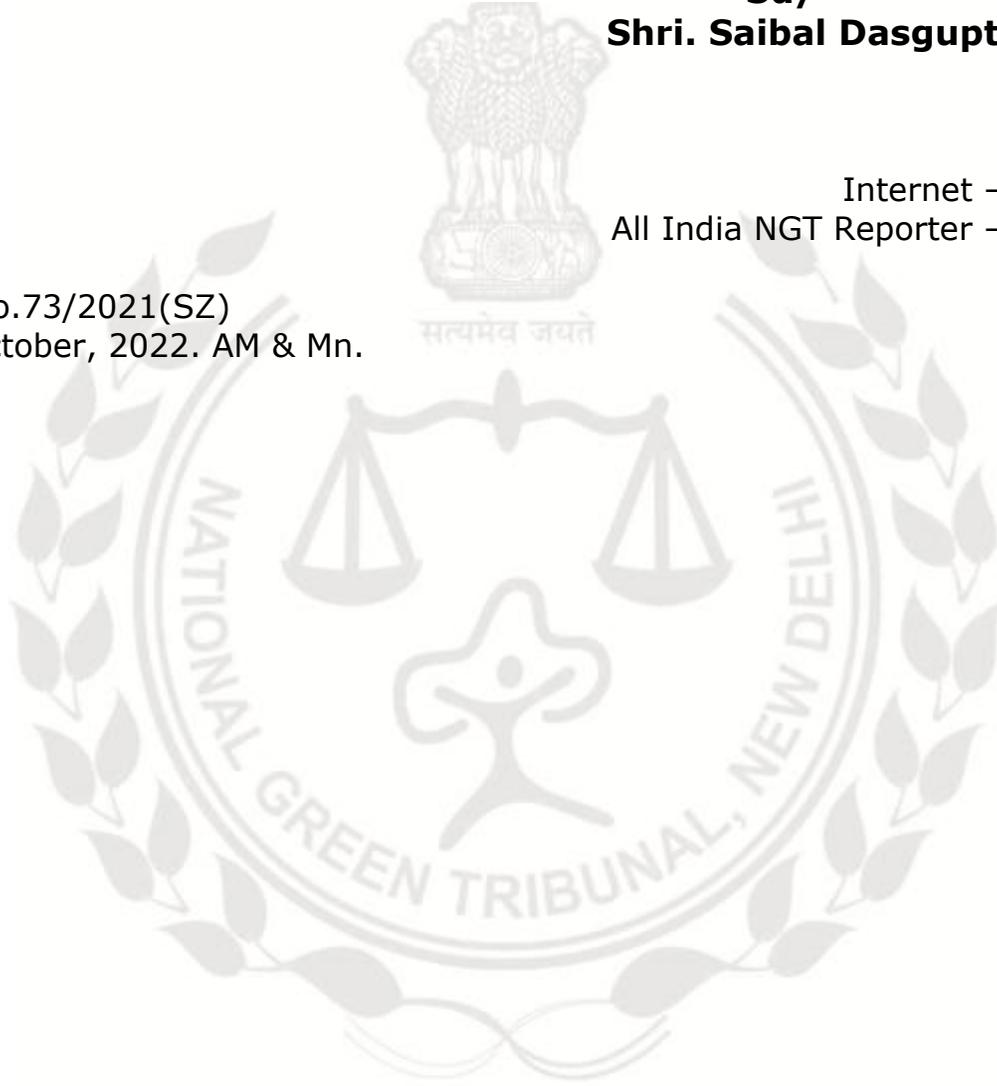
**Smt. Justice Pushpa Sathyanarayana, J.M.**

**Sd/-**

**Shri. Saibal Dasgupta, E.M.**

Internet – Yes/No  
All India NGT Reporter – Yes/No

O.A. No.73/2021(SZ)  
20<sup>th</sup> October, 2022. AM & Mn.



**NGT**