

## **UN GLOBAL COMPACT COMMUNICATION ON PROGRESS FOR 2005-06**

The 10 principles of Global Compact are mentioned below :

1. Businesses should support and respect the protection of internationally proclaimed human rights.
2. Make sure that businesses are not complicit in human rights abuses.
3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.
4. Elimination of all forms of forced and compulsory labour.
5. Effective abolition of child labour.
6. Elimination of discrimination in respect of employment and occupation.
7. Businesses should support a precautionary approach to environmental challenges.
8. Undertake initiatives to promote greater environmental responsibility.
9. Encourage the development and diffusion of environmentally friendly technologies.
10. Businesses should work against all forms of corruption, including extortion and bribery.

CPCL stands committed to the principles enshrined in the Global Compact and has been a forerunner in the effective implementation of each and every principle, for many years. This is being achieved through appropriate policies and programmes adopted meticulously by CPCL, besides total compliance of the relevant statutes all these years

**Principle One** - Businesses should support and respect the protection of internationally proclaimed human rights within their sphere of influence.

- CPCL continued its support to the internationally proclaimed Human Rights during the year
- We, at CPCL, treat all our employees as part of one Family and do not allow any distinction amongst our employees on grounds such as race, colour, sex, language, religion, caste, creed, etc
- We not only practice but also spread awareness of universal human rights and values like Freedom of movement, Rights relating to matters in relation to family, home, correspondence, reputation, etc, Right to Own a property, Freedom of opinion and expression amongst all our stakeholders through our in-house journal the “CPCL News”, organizing seminars and training programmes, etc
- We have developed a comprehensive system of Pay and other benefits wherein we have ensured that the remuneration and other benefits paid to our employees is one of the best in the Industry. In addition we have specifically designed various benefits to take care of other needs like Uniform, Subsidized Canteen, Housing and Vehicle advance at low interest rates, Furniture on hire purchase scheme, Medical facilities, Superannuation benefits over and above the statutory requirements,.
- In addition, we have also made substantial contributions for the development of the Community. Notable among them are :
  - i) Organizing a eye camp in Nagapattinam on 24.4.05 in association with Lions Club & Arvind Eye Hospital, a renowned eye care institution. A free eye care camp was also conducted at Manali on 16.10.05
  - ii) Provision of computers, printer and furniture to schools in the neighbouring villages on 10.8.05.
  - iii) Provision of sewing machines to unemployed women/youth of the neighbouring villages on 12.12.05.
  - iv) Promotion of sports by conducting a football tournament among the Manali neighbourhood youth on 2.2.06.
  - v) Organizing relief camps, providing food, water and other amenities to all the neighbouring villages during the unprecedented rainfall which caused havoc in Chennai last year.

**Principle Two-** Make Sure that businesses are not complicit in Human Rights abuses

CPCL has ensured that it is not a party to any Human Rights abuses during the year.

- Our Organization realizes that the prompt handling of grievances of employees and customers is of paramount importance in upholding of human rights and accordingly, we have framed a suitable policy to address any such grievances.
- Issues raised by surrounding villagers and other stakeholders like contractors, dealers and vendors are also attended promptly
- All our employees involved in liaisioning with above mentioned stakeholders are experts in their fields and are skilled in not only ensuring openness and transparency in following the principles of global Compact but also in promoting and encouraging the other stakeholders to safeguard the initiative and avoid potential abuse.
- We encourage our employees to express their views and also seek comments through our Intranet, wherein we have integrated Employee Communication System (ECS) and Intranet Message Board(IMB) for the purpose of enhancing employee participation. Through ECS, employees can directly raise issues, give suggestions, seek clarifications, etc with the Management. The IMB is basically an online discussion board wherein the employees discuss any matter of their liking.

**We have suitably responded to the call of Global Compact Principles One and Two by developing an awareness of human rights not only within our sphere of work but have also influenced all other stakeholders to uphold these universal values.**

**Principle Three-** Businesses should uphold the freedom of association and the effective recognition of the right of collective bargaining

CPCL realizes that the collective strength of employees is an effective partner towards the goal of achieving continuous sustainable growth.

- Freedom of Association is available to all our 1672 employees.
- Our Organization effectively engages in discussions with the collectives on all issues of common interest
- Policies on Pay and allowances as well as other benefits such as Medical Benefits, Leave Travel Concession. Promotion Policy, etc are duly discussed and finalized with the Collectives through Long term Settlements.
- Our Collectives have been our source of strength in achieving excellent performance continuously. The Organization on its part, suitably rewards all its employees by offering better career prospects and providing them with ample opportunities for growth.

- We have proactively shared details of performance, strategies and business plans and strategies with all our Collectives.
- We regularly send our Collectives to various programmes like Management Development programmes, Stress Management Programmes, Technology meets, etc to arm them with various functional as well as conceptual skills.
- A Long Term Settlement on work related benefits was entered into with our Recognized Unions during the year.
- During this year also, we have conducted the following trained programs for our Collectives :
  - i) A programme on “Trade Union Development” was conducted in two batches at Hyderabad during April 2005. Around 50 employees participated in this programme
  - ii) Around 30 employees benefited from the “Professional Development Programme for SC/ST Officers” held at NITIE, Mumbai during 5<sup>th</sup> – 9<sup>th</sup> December 2005 and Indian Institute of Petroleum, Dehradun during 19<sup>th</sup> – 23<sup>rd</sup> December 2005.
  - iii) On 25<sup>th</sup> June 2005, at Chennai, a one day programme was organized on “Trade Union Development” for the benefit of 50 Office bearers/committee members of our Unions (Photograph Attached).
  - iv) In view of the requirements of our SC/ST Association, a development programme was held on December 16<sup>th</sup> and 17<sup>th</sup> at Chennai, 29 employees took part in this programme.

**Principle Four-** Organization supports the elimination of all forms of forced and compulsory labour.

- CPCL believes in voluntary labour and no instances of forced / compulsory labour have come to light during the year.
- As regards compliance of the above by contractors, provisions have been built into the Contract agreement wherein it is stipulated that the contractor has to strictly comply with all labour and other laws/ rules and regulations in relation to the labour.
- In order to ensure the compliance of the above by the Contractor, CPCL also conducts periodic checks and inspection of the contractor’s premises, information and records.
- During 2005-06, we have recruited 5 SC employees and 16 employees belonging to Other Backward Castes (OBC).

**Principle Five-** The effective abolition of child labour.

- We, at CPCL, employ only those people who have attained the age of 18 years
- Our contractors are also required to scrupulously follow the laws/ rules and regulations in respect of engagement of Child Labour.

**Principle Six** – Elimination of discrimination in respect of employment and occupation

CPCL believes in providing equal opportunity for employment and occupation without any discrimination.

- CPCL provides equal opportunities for employment as well as growth opportunities without any discrimination on the basis of race, sex, religion, language, social origin, birth or other status.
- We employ around 70 women employees who constitute around 4.2% of our total employee strength. Our Women employees are placed at various levels of the Organization starting from workman to the Middle Management Level.
- We organize many Women specific development programmes like “Women in today’s Organization”, “Workplace Harassment,” “Communication”, etc for the benefit of our women employees.
- We follow all the Governmental guidelines regarding reservation for Scheduled Castes / Scheduled tribes/ Other Backward Castes and Physically Challenged Persons.
- On the occasion of International Women’s Day, a seminar on the theme “Beyond Laws”. “The Right to be me” was organized, in which eminent women professional from various fields participated.

**We have Managed to deal with fundamental principles in the workplace and have successfully implemented the universally accepted Labour principles in our Organization.**

**Principle Seven** – Businesses should support a precautionary approach to environmental challenges.

**Principle Eight** – Undertake initiatives to promote greater environmental responsibility.

**Principle Nine** – Encourage the development and diffusion of environmentally friendly technologies.

We at CPCL, recognize the impact of industrial operations on environment. We believe that our commitment to Safety, Health and Environment (SHE) is fundamental to CPCL’s values. Therefore, we continuously work towards minimizing the impact of our operations on SHE. To this effect, CPCL took several initiatives in 2005-06 which include :

- CPCL complied with the pollution control norms prescribed by statutory authorities. Procurement action has been initiated for continuous stack monitoring stations for SO<sub>2</sub>, Nox and SPM with a budget of US \$ 1.3 million in the remaining major stacks of the refinery (Ref.I and Ref.II)

- In 2005-06 DeNOx technology has been implemented in 8 major stacks of Ref-III at a cost of Rs..11 crores. This is in addition to the installation of low Nox burners in all the furnaces and process heaters of Ref.III. These two facilities are meant for reducing the emission of Nox from the stacks. Low Nox burners are planned in two major furnaces of Ref.I as part of revamp of atmospheric heater and will be implemented in 2007-08.
- CPCL has implemented the new Zero Discharge Plant in 2005-06 at a cost of US \$ 2.4 million to recycle the treated effluents of ETP-III and produce water for use in captive power plant as DM water feed.
- CPCL is implementing additional 2.5 MGD (475 KL/Hr.) sewage reclamation plant at a cost of US \$ 10 million for recycling and use of city sewage into feed water of DM plant for power generation. It comprises of Sequential Batch Reactor – SBR (a state of the art bio-treatment process for sewage) followed by Ultra-filtration and Reverse Osmosis processes. CPCL is implementing a seawater desalination plant to produce 5.88 MGD of product water for process use. These projects help in resource saving of raw water for public water supply.
- In 2005-06, plantation of around 2000 trees in Refineries at Manali and CBR and their surrounding areas was done.
- Debottlenecking of Tertiary Sewage treatment plant by replacing existing conventional treatment with the state-of-the-art Ultrafiltration system for City Sewage Reclamation for refining process use.
- All Sulphur Recovery units operated efficiently with over 99% recovery of sulphur from Refinery Fuel Gas.

Commitment and involvement of all employees in SHE initiatives is the most important success factor for our company.

The SHE Annual Report of CPCL for the year 2005-06 is a Saga of our efforts to realize our Corporation Vision and Mission of working towards “Prevention of Occupational injury and ill health, damage to property and environment (copy enclosed).

**Principle Ten** – Businesses should work against corruption in all its forms, including extortion and bribery

CPCL is one of the leading voice in the battle against Corruption. We have tried to tackle the problem of Corruption and ensure transparency in our operations in the following ways:

- The conduct rules of our employees namely the Conduct, Discipline and Appeal rules applicable to our Supervisory employees and the Standing Orders applicable to the non-supervisory employees specifically bar accepting, giving, demanding or offering of bribe or any illegal gratification and describe it as a misconduct.

- We have also built checkpoints like Annual declaration of property (movable and immovable assets), notifying the company in case of receipt of gifts above a certain value, hospitality and potential conflicts of interest, etc which help in preventing corruption.
- Our Organizational culture encourages transparency, honesty and has clear cut guidelines on acceptable behaviour, which help in eliminating evils of corruption.
- Checks have been in built into the organizational processes governing procurement, marketing, materials, personnel, etc in terms of Manual on delegation of authority.
- Numerous training programmes and workshops are held for disseminating knowledge about organizational systems and building an anti-corruption culture.
- Two days workshop on “Preventing Corruption” covering risks of corruption and corruption prevention actions in relation to planning, design, tendering, construction, operation & maintenance of CPCL’s facilities was conducted by “Transparency International (UK)” at CPCL Training Centre on 21.01.2006.

**Our Organization has set high ethical standards and has taken a principled stand against all forms of corruption.**

**SAFETY, HEALTH AND ENVIRONMENT**  
**ANNUAL REPORT: 2005 – 06**



**WORLD ENVIRONMENT DAY – 5 June 2006**

**DESERTS AND DESERTIFICATION**

**DON'T DESERT DRYLANDS!**



***Chennai Petroleum Corporation Limited***  
***(A group company of IndianOil)***



# **SAFETY, HEALTH AND ENVIRONMENT (SHE)**

## **ANNUAL REPORT: 2005 – 06**

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**A Step Forward towards....**

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## Foreword by The Managing Director

“World Environment Day” observed on 5<sup>th</sup> June every year stimulates world wide awareness on Environment protection. Every year, United Nations Environment Programme declares a theme for this Day in order to bring world attention on prevalent environmental issues. The theme selected for this year is **“Desert and Desertification”** and the slogan is **“Don’t Desert Drylands”** More than 60% of worlds eco-systems are in decline. These include drylands, forests, fisheries and even the air that we breathe. In spite of increasing awareness on their protection, human kind continues to squander out natural capital. We need to act before it is too late.



We at CPCL, recognize the impact of industrial operations on environment. We believe that our commitment to Safety, Health and Environment (SHE) is fundamental to CPCL’s values. Therefore, we have to continuously work towards minimizing the impact of our operations on SHE. To this effect, CPCL took several initiatives in 2005-06 which include:

- Plantation of around 2000 trees in Refineries at Manali and CBR and their surrounding areas.
- Commissioning of a new Zero Discharge plant so as to reuse treated effluents from Refinery III, after “Ultrafiltration” and “Reverse Osmosis”.
- Debottlenecking of Tertiary Sewage treatment plant by replacing existing conventional treatment with the state-of-the-art Ultrafiltration system for City Sewage Reclamation for refining process use.
- Two new Ambient Air Quality Monitoring stations added to the existing 6 Nos. to monitor SO<sub>x</sub>, NO<sub>x</sub>, Particular matters, etc. in air.
- A project on DeNO<sub>x</sub> of Flue gas completed for major process heaters of Refinery III. It will minimise NO<sub>x</sub> emission, in addition to the low NO<sub>x</sub> Burners already provided in these heaters.
- All Sulphur Recovery Units operated efficiently with over 99% recovery of sulphur from Refinery Fuel Gas.
- Projects initiated for one more 2.5 MGD capacity city sewage reclamation plant and a 5.8 MGD Sea Water Desalination plant, with total investment cost of Rs.279 crore.

Commitment and involvement of all employees in SHE initiatives is the most important success factor for our company. While we have come a long way in meeting our commitments in line with our Policy on *Quality, Environment, Health and Safety*, there are still numerous challenges ahead.

The SHE Annual Report of CPCL for the year 2005-06 which is published on this day is a Saga of our efforts to realize our Corporate Vision and Mission of working towards “Prevention of Occupational injury and ill health, damage to property and environment...” I hope this report will not only remain as a document of our past performance but also serve as a step forward towards meeting our future goals.



**K.K.Acharya**  
Managing Director

**Place: Chennai**  
**Date : 5<sup>th</sup> June 2006**



## **SALIENT FEATURES IN THE FIELD OF S H & E RELATED ACTIVITIES AT CPCL, CHENNAI**

- Refinery achieved specific energy consumption of 77.1 MBTU/BBL/NRGF.
- Hydrocarbon loss is 0.43 % wt on the total crude processing.
- Production of diesel with 0.05 % sulphur to meet Bharat Stage II and 0.035 % sulphur to meet Euro III requirements.
- Recycle of treated effluent from the three ETPs on sustainable basis.
- ISO – QEHS certifications
- CPCL's approach to United Nations Global Compact

CPCL since its inception has accorded topmost priority on sustainable development in harmony with nature. Use of best available Eco-friendly technologies, strict control over polluting parameters, re-use of water, zero discharge, reduction of consumption level of resources have been implemented.

### **Waste Water Treatment & Re-use/recycle:**

- Reclaim and reuse of secondary treated city sewage by TTP – UF and RO.
- Three State-of-the-art effluent treatment plants to treat and recycle the effluent generated in the refinery.
- Implementation of zero discharge projects – ultrafiltration membrane technology followed by RO for recycle and reuse.
- A recycle plant to recover RO rejects

### **Stack Monitoring of emissions:**

- On line SO<sub>2</sub> analysers in all the major stacks
- On line NO<sub>x</sub> analysers in all the major stacks
- On line SPM analysers in all the major stacks
- Use of low NO<sub>x</sub> burners in boilers and process furnace heaters of DHDS and Refinery III.
- Pre commissioning of DeNO<sub>x</sub> facility in process heaters of the Refinery III to reduce NO<sub>x</sub> emissions
- Sulphur Recovery Units with 99.3 % recovery.

### **Ambient air quality monitoring and control:**

- Eight numbers of continuous AAQMs in different locations of the refinery
- Monitoring of weather parameters
- Operation of cleaner production / manufacturing / processing technologies
- Maintaining green belts around the refinery



### **Pioneer in Eco-friendly products/fuels:**

- MS with 1 % benzene
- Production of diesel with 0.05 % sulphur to meet Bharat Stage II and 0.035 % sulphur to meet Euro III requirements.

### **Water Conservation measures:**

- Specific consumption of water has been brought down from 3.45 KL/MT of crude processed (1969) to 2.48 KL/MT (1980) and now stabilized at 1.18 KL/MT of crude processed.
- Ground water recharging by rain water harvesting.

### **Specific Energy Consumption Reduction:**

- Refinery power and steam is produced through cogeneration mode for optimum usage of energy.
- Refinery achieved specific energy consumption of 77.1 MBTU/BBL/NRGF.

### **Unique solid waste handling:**

- In wax polishing hydro-finishing process adopted in place of clay contact unit to avoid solid waste generation
- In situ cleaning of tank bottom sludge through chemical and mechanical cleaning.
- State-of-the-art storage facility for accumulated oily sludge.
- Mechanical treatment of the oily sludge followed by Bio-remediation to liquidate the accumulated oily sludge.

### **Other activities:**

- Minimisation and replacement of “use and throw-away” plastics:
- Solid waste management in refinery through segregation of wastes
- Creating awareness among employees on water conservation (conducting exhibitions, distributing booklets, conducting competitions, etc)
- Environmental Literacy drive in neighboring villages, schools through dance, drama, etc.



## ZERO DISCHARGE PROJECT FOR REFINERY III

By recycling 100% of treated effluents generated, a quantity of about 350 KL / hr of raw water is saved.



### Effluent treatment plant

#### Average treated effluent quality for the year 2005 – 06.

S.No.	Parameters	Average treated effluent quality	MINAS standard
1	pH	7.3	6 – 8.5
2	Oil & Grease	9.3	10
3	Sulphides	0.45	0.5
4	Phenol	0	1
5	Suspended solids	18.7	20
6	BOD	13.8	15
7	COD	54.7	250

All values in mg/lit. except for pH.



## ZERO DISCHARGE PROJECT

To ensure Zero Discharge of treated effluents of Refinery III, a new Zero Discharge Plant has been commissioned. This plant was commissioned by Mr. S.C.Tripathi, Secretary to Government of India, Ministry of Petroleum and Natural Gas, at CPCL's Manali Refinery complex on 27.12.2005 in the presence of Mr. R.Sankaran, Managing Director (i/c), and other senior officials of CPCL.



The Rs.10.44 crore plant has a capacity of 200KL/HR, that is, 1 MGD (1 million gallons per day). This plant thus enables the use of treated refinery effluents for the refinery's process applications.

The conversion of treated effluent to good quality water, using eco-friendly membrane process, is superior to conventional chemical treatment process. This plant uses hollow fibre, low pressure, capillary membranes for Ultra filtration and state-of-art spiral wound Reverse Osmosis membranes. The water thus produced, is free of suspended solids, colloids, micro organisms and dissolved solids.



**UF & RO section**



**Stages of effluent treatment**



## DEBOTTLENECKING OF EXISTING TTP – RO PLANT

A Tertiary cum RO plant installed for reclamation of city sewage about 2.5 MGD (475 KL/hr) which is first of its kind in Asia in magnitude and application wise. This plant converts city sewage, which is a waste into high quality process (boiler feed) water. However, the technology of tertiary treatment envisaged in this plant was '**Conventional**' method of physico-chemical treatment.

CPCL carried out R&D studies with various technologies like dyna sand filtration cum ion exchange, high efficiency reverse osmosis process, photochemical oxidation and ultrafiltration as alternatives to conventional tertiary treatment and UF technology is now adopted.

CPCL established Ultra Filtration System in lieu of the conventional nine stage tertiary treatment as part of debottlenecking of TTP at a cost of about Rs.7.4 crores, by utilising only three of the existing units, viz., hydrotreater, break point chlorination system & multimedia filtration and further pumped to the Ultra Filtration system.



**Ultra Filtration**



**Intermediate storage pond**

The major advantages of this project are:

- No sludge handling / disposal problems
- Direct reduction in consumables such as chemicals (coagulants/flocculating agents), cartridge filters, etc. which contributes to the major of the O&M cost
- Low energy requirements

The use of reclaimed water, results in substantial savings in chemical consumption in treating water for our captive power plants; helps in resource saving of Raw Water which now can be diverted for use by the city population and avoids discharge of the treated effluents.



## REJECT RECYCLE PLANT FOR RECOVERY OF WATER FROM RO REJECTS

On average 80 KL/hr (0.42 MGD) of RO rejects with TDS of 4000-5000 mg/l are generated from sewage reclamation plant. This plant recovers these rejects with an additional train of reverse osmosis membranes and reclaim about 40-50 KL/hr of water.

### R & D ACTIVITIES

CPCL has completed studies on indigenisation of T.F.C. – RO - membranes in collaboration with Central Salt & Marine Chemicals Research Institute, Bhavnagar and has installed a 1 MLD indigenous RO plant at TTP-RO Plant.



- The plant is provided with 40 numbers of indigenous RO membranes developed after an 8 year R&D work at different levels viz., lab scale, prototype pilot plant etc jointly by CPCL & CSMCRI.
- This 1MLD capacity Demonstration RO plant is in operation continuously in the TTP RO campus.
- Based detailed modeling of various alternates for RO rejects, we are implementing the RO rejects recovery plant – this plant using Sea water RO membranes of TORAY will recover 50% of the feed was product water for use in cooling towers.

### PROJECTS UNDER IMPLEMENTATION

- CPCL is now implementing an additional 2.5 MGD sewage reclamation plant, scheduled to be completed in September 2006.
- The work is in progress for implementing Sea water desalination plant to produce 5.8 MGD of product water.





## Performance data of ETPs, ZDP, TTP & RO 2005-06

<b>ETP</b>	ETP-I Effluent Processed m <sup>3</sup> .	1857140
	ETP-II Effluent Processed m <sup>3</sup>	1593460
	ETP-III Effluent Processed m <sup>3</sup>	1793079
	Cost of chemicals used in ETP I, II & III of m <sup>3</sup>	3.68
<b>TTP-RO-ZDP</b>	Sewage received m <sup>3</sup>	3248694
	TTP Water Produced m <sup>3</sup>	3193782
	RO Feed m <sup>3</sup>	2814406
	Total RO Permeate produced (A,B,C,D Banks Demo Plant) m <sup>3</sup>	2106368
	RO Permeate Export m <sup>3</sup>	2488331
	TTP Water Export to CT m <sup>3</sup>	857815
	Guard Pond Water to ZDP m <sup>3</sup>	695184
	ISP water to ZDP m <sup>3</sup>	347928
	Feed to ZDP m <sup>3</sup>	972824
	UF Permeate Produced m <sup>3</sup>	979251
	Recovery %	91.76
	RO Demo plant feed m <sup>3</sup>	215826
	RO Demo plant product m <sup>3</sup>	161527
	RO Rejects produced m <sup>3</sup>	621973
	RO Rejects sold to MPL-II m <sup>3</sup>	121110
	Cost of chemicals per m <sup>3</sup> of UF permeate Rs.	0.54
	Cost of chemicals of m <sup>3</sup> of TTP-UF water Rs.	0.42
	Cost of chemicals per m <sup>3</sup> of RO water (TTP+UF+RO) Rs.	3.00
	Cost of chemicals per m <sup>3</sup> of RO water (ZDP+UF+RO) Rs.	3.63
	Cost of chemicals per m <sup>3</sup> of UF+RO Rs.	2.45
<b>Slop Oil</b>	Slop oil transferred, KL	74548
	Oily sludge processed, KL	6280



## MECHANICAL TREATMENT OF OILY SLUDGE

The process involves the following steps:

Use of steam to liquefy the oily sludge; mix with cutter stock; pass through strainer / vibro-screen; mix the contents with chemical demulsifier ; pass through heat exchanger followed by decanter centrifuge and separate solids and liquids (water, oil)



Oily sludge is taken out of the sludge lagoon in liquid form by heating the contents to about 50 C using steam and pumping out in to **feed tanks (Tk-1 and Tk-2)** using a vertical transfer pump. The sludge in feed tanks is maintained at 60 C using MP steam to make it suitable for pumping in to **agitator tank (Tk-3)** located at a height of 20 ft from ground level.



The feed sludge, taken in batches of 20 KL each time, is received on **Vibro-screen** fixed top of the **Tk-3** for removal of debris like leaves, rags, stones, etc. **Vibro-screen** is fitted with SS mesh of different sizes for removal of debris.

**Tk-3** receives cutter stock from **LCO tank** for dissolving the heavy oil fraction and demulsifier poly-electrolyte from **Chemical dosing tank** for breaking the emulsion as also hot water (from **Hot water tank**) for washing the debris.

Contents of the **Tk-3** are received by gravity in to **Feed Conditioning Tank Tk-4 & Tk-4A** maintained at 60-70 C using steam.

The conditioned feed is then routed to **Heat exchanger** where the temperature is raised to 80-90 C using steam and then pumped to a **Decanter Centrifuge** located at 10 ft from ground level.

**Decanter centrifuge** separates the oily sludge in to 3 phases namely oil, water and solids. Hot water is pumped in to the **Centrifuge** for washing the solids (final sediments) free of soluble salts and also to clean the **Centrifuge** after completing each batch.



Separated water is received in **Tk-5** while recovered oil is received in **Tk-6** by gravity. Separated water meeting the specification is pumped to ETP-III via the leachate sump / pump system located nearby. Recovered oil meeting the specification is pumped to Slop tank for blending with Crude oil or FO depending on the quality parameters.

Specifications for the final products from oily sludge are – BS&W < 2% in recovered oil, oil content <5% in final sediment, oil content of <100 ppm in the separated water.

The recovered oil is routed to Slop oil tanks for blending with FO, separated water is routed to ETP for removal of traces of oil before reuse and final sediments are sent for bio-remediation.

Final sediments not meeting the specification of < 5% oil are reprocessed by transferring to **Tk-3** (Agitator tank).

Separated water not meeting the specification of < 100 ppm oil is pumped from **Tk-5** to **Tk-3** for reprocessing.

Recovered oil not meeting the specification of <2% BS&W is pumped from **Tk-6** to **Tk-3** for reprocessing.

## BIO-REMEDICATION OF OILY SLUDGE

Bioremediation is an ecologically sound, natural process; sludge eating bacteria can increase in numbers when an oily sludge (contaminant) is available. When the contaminant is biodegraded, the microbial population naturally declines. The residues from the biological treatment are usually harmless products (carbon dioxide, water and fatty acids).

Many species of soil bacteria, use petroleum hydrocarbons as a food/energy source, transforming them into harmless substances consisting mainly of carbon dioxide, water and fatty acids. Biodegradation harnesses this natural process by promoting the growth of microbes that can effectively biodegrade specific contaminants and convert them to non-toxic by-products. There are two basic types of biodegradation. Bio-stimulation provides nutrients to the indigenous microbial populations. This promotes growth and increases metabolic activity, which is used to biodegrade contaminants. Bio-augmentation introduces specific blends of micro-organisms into a contaminated environment or into a bioreactor in initiate the biodegradation process.

Biodegradation of oily sludge is carried out using the sludge degradation bacterial system that has been developed by The Energy and Resources Institute. Oilvorous-S is formulated with a powdered material and packed in reusable poly-bags for easy transportation to various locations.



## Methodology

Oily sludge management by Oilyvorous-S can biodegrade oily sludge at fast rate.

500 MT of residual sludge from HDPE lined pit is applied in sludge treatment site for biodegradation. Sludge is spread over the soil with 6" layer so that tilling can be done easily. The sludge treatment site is segregated by fencing and should be marked as oily sludge treatment site. Bore well are installed at upstream and downstream of sludge treatment site. To maintain moisture content in sludge treatment site, hosepipe is installed at the site.

After every sludge loading, heavy doses of Oilyvorous-S and nutrients are applied over the sludge. Oily sludge and Oilyvorous-S are mixed by tilling. At 15 days interval, tilling is essential to enhance the sludge biodegradation by Oilyvorous-S. In summer months, water sprinkle is essential at 15 days interval to maintain the moisture level in sludge treatment site.

Exposure of microbes to aerobic conditions is ensured by mixing / tilling periodically. Microbial population is maintained at adequate level by supplementing with periodic application of microbes and nutrients. 95% reduction in initial oil content of the sludge is achieved in a period of 8-10 months.

Oilyvorous-S is a consortium of microbes comprising of

- Acinobacter sp. TERI 19
- Acinerobacter sp. TERI 20
- Burkholderia sp. TERI 21
- Pseudomonas sp. TERI 25

In CPCL, bioremediation project of 500 MT of oily sludge was started on experimental basis in October 2004 and 96% removal of oil was achieved by Aug'05.



**Oily sludge before bio-remediation**



**Oily sludge after bio-remediation**

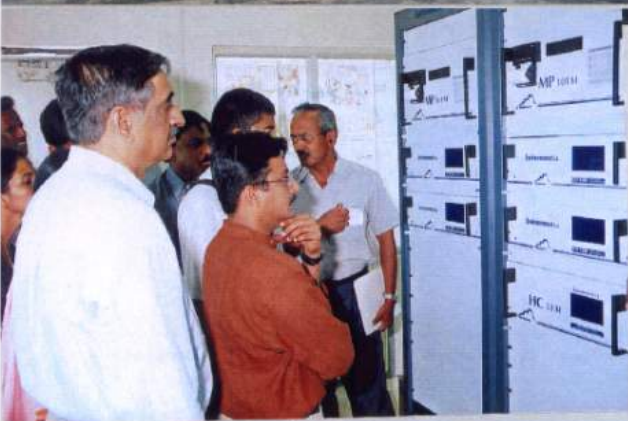


## CLEANER AIR

- a) Air pre-heaters and economisers installed to reduce flue gas emissions.
- b) Floating roof tanks with secondary seals have been provided for crude and light end products to reduce hydrocarbon and fugitive emissions.
- c) Flare gas recovery unit is provided to recover hydrocarbons going to the flare system.
- d) Stack height increased in phases for effective dispersion of emission.
- e) Hydrocracker unit commissioned to improve quality of petrol and diesel products of the refinery and reduce overall sulphur emissions from the refinery.
- f) New sulfur recovery plant with Max Clauss process (S recovery>99%) has been installed to recover elemental sulfur from acid gases
- g) Use of low NO<sub>x</sub> burners in boilers and process furnace heaters of DHDS and Refinery III.
- h) DeNOx facility is completed in process heaters of the Refinery III to reduce NOx emissions
- i) Continuous stack gas analysers in all major refinery stacks for monitoring SO<sub>2</sub>, NO<sub>x</sub> and SPM.
- j) State-of-the-art eight numbers continuous ambient air quality monitoring stations.



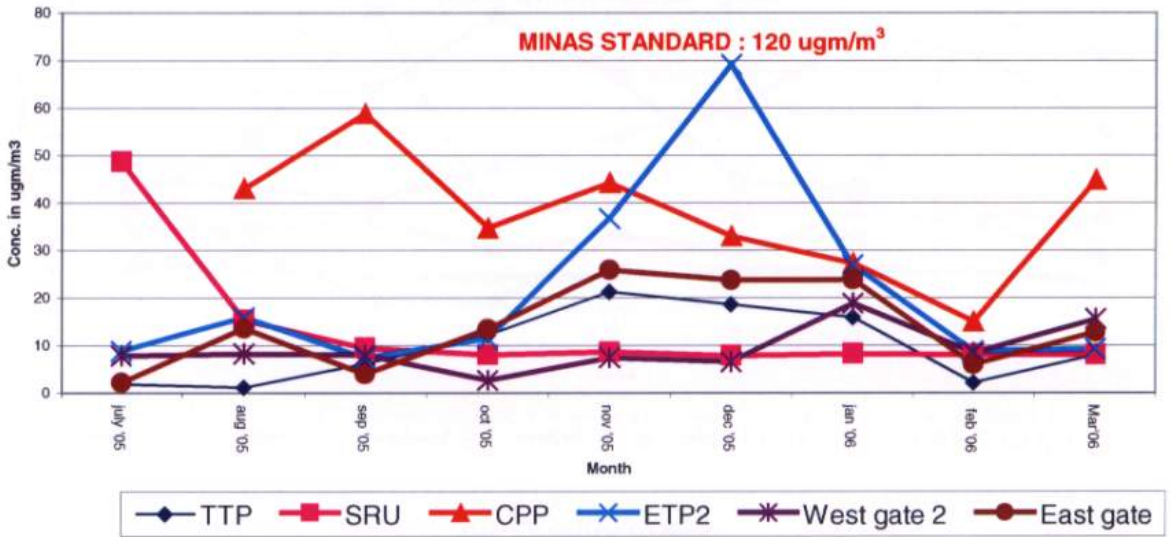
**Ambient air quality monitoring station**



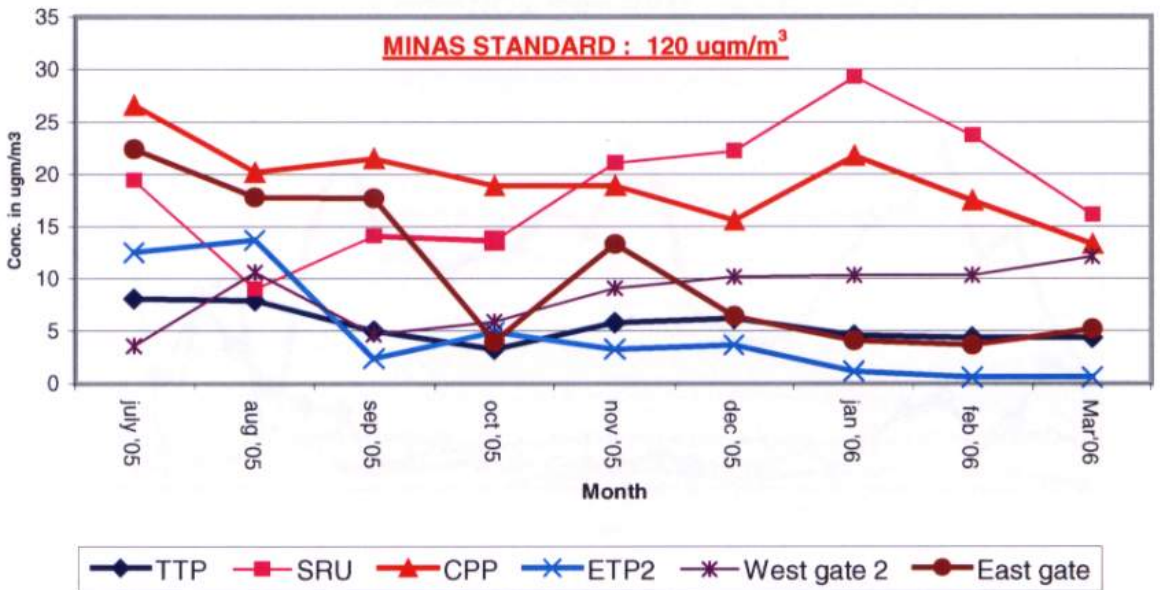
**LAEC members' visit to Ambient air quality monitoring station**



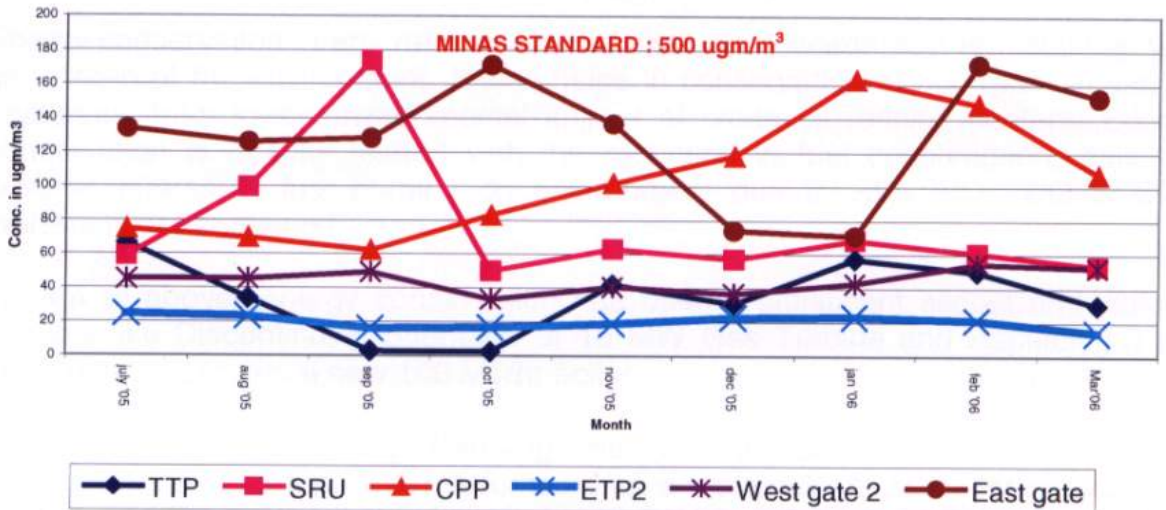
**SO2 values from Jul.05 to Mar.06**



**NOx values from Jul.05 to Mar.06**

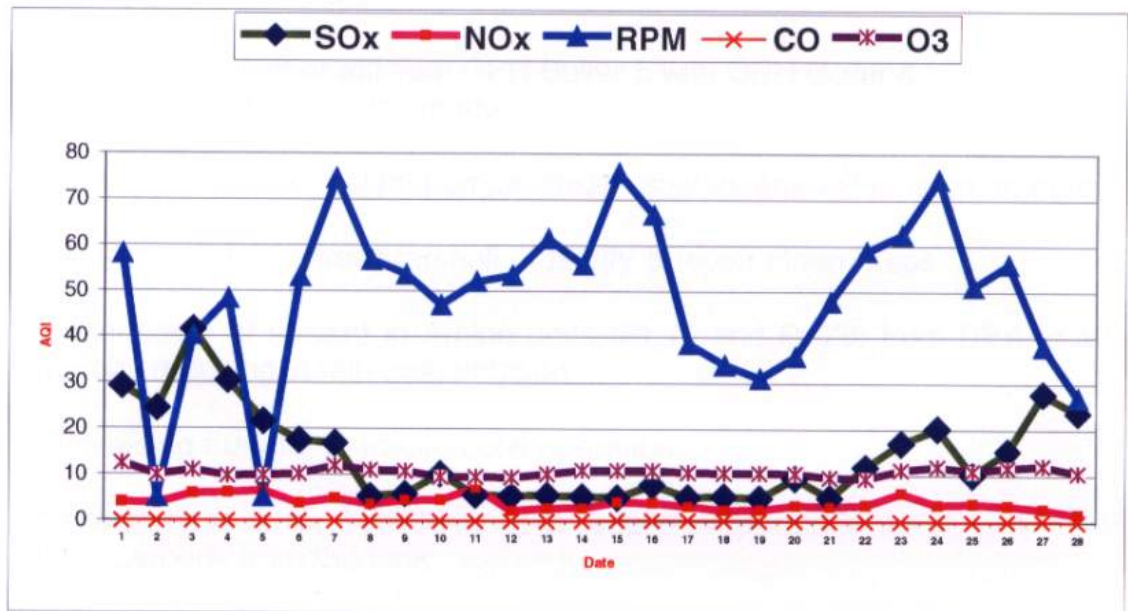


### SPM values from Jul.05 to Mar.06



### Air Quality Index:

Air quality index (AQI) is a measure of pollutants in Ambient Air – as per USEPA, this AQI can be calculated based on VOC, Ozone in the ambient air and of the routine pollutants like  $\text{SO}_2$ ,  $\text{NO}_x$ , RPM, etc. This was carried out from Feb'06 onwards and the results for Feb-Apr'06 show that AQI values inside CPCL premises are in good category (healthy).



### AQI for February 2006



## ENERGY CONSERVATION

Energy conservation in any refinery plays a vital role towards cost reduction as well as upkeep of the environment. It also helps in conservation of non-renewal natural resources, thus lower environmental impact at crude oil refining centers. Energy conservation is directly related with the reduction in fuel consumption, thus the adverse effects of fuel burning on environment due to SO<sub>2</sub>, NO<sub>x</sub>, CO & CO<sub>2</sub>, emissions are contained.

In view of above, Energy conservation has been a significant aspect and various projects like Discontinuing operation of 10 MW Gas Turbine and Replacing 2 old inefficient boilers with a new 100 MT/hr boiler

During 2005-06, additionally, following energy saving schemes were carried out. Polarchem L2K trial run in 1F1-A furnace, on a trial basis, to study for reduction of Fouling and Corrosion on the fireside heat transfer surfaces, Fuel management by application of Magnetic Resonators in Gas Turbines.

Refinery achieved specific energy consumption of 77.1 MBTU/BBL/NRGF in the year 2005-06. Hydrocarbon loss for the year 2005-06 is 0.43 % wt on the total crude processing.

### Energy Conservation measures implemented / initiated:

- Shutting down of Old GT
- Running new higher efficient OPH Boiler 5 with OPH Boiler 4. Boiler 3 is kept in standby mode.
- VSD application for select pumps, fin-fan coolers and FD fans on heaters
- Steam audit by Forbes Marshall - Identify & repair steam traps
- Changeover of solvent in Amine units (Pt 18 and Pt 79) from DEA to MDEA, thereby reducing steam consumption
- Optimising Furfural Extraction unit operation
- Secondary seals for 6 crude tanks to reduce evaporative loss of light hydrocarbons from the tank





## STRENGTHENING OF FIRE & SAFETY SYSTEMS

### IMPROVEMENT & NEW DEVELOPMENTS IN SAFETY MANAGEMENT SYSTEM

- Plant inspection is carried out regularly by safety officers and formulated a system of reporting of Unsafe Acts / Conditions in the plant. Immediate corrective actions are taken.
- Achieved Excellent rating for the two criteria in Safety set as MoU targets.
  - Man-hours lost due to accident as a percentage of total man-hours worked is 0% for the year 2005-06.
  - Off site mock drill was conducted on 09.08.2005 by the District Collector at TPL.
- A comprehensive QEHS (Quality, Environment, Health & Safety) policy adopted and the external Surveillance audit was conducted by BVQI. All NCR's pertaining to Fire & Safety were complied.
- A Comprehensive Risk Analysis Study for entire refinery including Refinery III was carried out by CISRA (Center for Industrial Safety & Risk Analysis) of CLRI, Chennai in Nov'2004. All the recommendations were complied.
- The hazard & operability studies committee is constituted to conduct HAZOP study where ever a new plant or process is added or modification. The recommendations were carried out.
- A timely corrective action based on near misses will help to prevent a major accident. With a view to improve reporting of near misses, to motivate our employees and cultivate safety culture, Management introduced Rs 100/- as cash award for every Near miss incident reporting and for every Lucky draw winner a prize award of Rs 5000/-.





### Managing Director drawing a lot among the no. of Near Miss incidents reporters

Total no. of Near Miss information and incident received during Apr, 2005 to Mar, 2006 is 93 Nos.

- To create safety awareness among the visitors and contractors, 2 different 5 minutes safety video films were developed and the visitor's film screened at west gate in security office.
- All the Accidents, Fire, HI-PO near miss incidents, are thoroughly investigated to find out the root cause. The recommendations based on the analysis are sent to respective units. Action taken report is followed up closely with concerned units heads for compliance.
- As part of Good House Keeping practices exhaustive survey made and all point are liquidated.
- As part of system safety Audit an exhaustive Internal Electrical Safety Audit, Internal construction Safety Audit, FIRES, ACCIDENTS, NEARMISS INCIDENTS compliance Audit, Statutory compliance Audit were conducted this year. The recommendations are sent to the section head and department HODs for compliance.
- Additional OSR indigenous equipment is placed in Service. Imported OSR equipment was procured and it was handed over to Chennai, Port Trust.
- Specification of the personal protective equipments are reviewed and updated as per OISD and IS norms. Strict enforcement of using appropriate PPEs by all categories of employees, and all other workers was followed.



- Traffic Management system in the Refinery was reviewed and updated with additional checklists in line with OISD STD 157 and statutory regulations

### **Mock Drill :**

#### **Departmental Mock Drill**

- Monthly department Mock drill was conducted regularly with list of safety observers to check the fire & Safety crew alertness; following up of the procedures and turnout. The observations, shortcomings, feedbacks are reviewed in the closing meeting.

The action points are developed and immediately taken up for corrective action. The consolidated report is submitted to manager of factory and reviewed in the CSC meeting. Reviewed report is circulated to all concerned.

On site emergency control center has been opened.



Meeting in progress at ON-SITE Emergency control centre

### **ON-SITE Mock Drill**

- On site Emergency preparedness plan was revised and mock drills were conducted with mutual aid partners (Tamilnadu Petroproducts Limited & Madras Fertilizers Limited) and associating statutory authorities as external observers. External observers witness for the fire & Safety crew alertness; methodology, following up of procedures and turnout. The observations, shortcomings, feedbacks are reviewed in the closing meeting. The action points are developed and immediately taken up for corrective action. The consolidated report is submitted to manager of the factory and reviewed in the CSC meeting. Reviewed reports are circulated to all concerned.





### **OFF-SITE Mock Drill**

- Offsite emergency mock drill was conducted on 09-08-2005 by the District Collector at TPL- CPCL participated.

An off-site emergency mock drill was conducted in full scale in Manali area at 1100 hrs., on 09.08.2005. There was a leak of hydrofluoric acid in Tamilnadu PetroProducts Limited and the vapour cloud was moving north towards Sadayankuppam village. The police department and the Sub collector, Ponneri were informed. All departments – Police, Revenue, Electricity, water, Factory Inspectorate, Home guards, Health departments, pollution control board, neighbouring industries, town panchayats, press and municipality were informed and all of them participated and carried out their roles in the off site emergency drill. 50 to 60 people were evacuated from Sadayankuppam village and moved to Amulavoyal panchayat union school and treated by doctors there and they were also provided with food. When the emergency was called off at 1200 hrs., the people were returned to their village. The District Collector and the Chairman of the District Crisis group reviewed the preparedness of each of the department in dealing with an Off-site emergency at TPL, Manali at 1235 hrs.

### **Best Practices & Initiatives in Safety Management System:**

- The entire Refinery has been declared as “No Smoking” Zone and use of cell phones inside the plant is prohibited.



- Statutory Safety Audit for CPCL was carried out on March 2005 by National Safety Council, Tamilnadu Chapter and the recommendations are being implemented.
- In order to improve the Safety, 20 safety Surveillance team was formed and headed by DGMs. Each team consisting of three members – DGM / CM, CM and an Electrical engineer have been formed to carryout safety surveillance.
- ESA and surprise safety check were carried out by OISD and the recommendations are implemented.
- On-Site Emergency Preparedness plan was revised, updated and sent to Inspectorate of Factories for approval.
- Entire Refinery is divided into 12 Zones, Once in 45 days, each zone is surveyed by team consisting of a Safety Officer and the designated Zonal Safety Officer for the safety requirements based on a checklist.

#### Special equipment – Spark arrestor

- As per Safety Norms CCE approved spark arrestors were fitted in the authorised vehicles and in all IC engines in the refinery premises and loading areas.

#### Work permit systems

- A revised procedure and instructions on issue of work permits supplement to OISD STD -105 was issued to all employees for strict compliance.
- Separate work permits system for working at height is implemented.
- Safety Manual, Various pamphlets are prepared, and issued to all employees and contract workers respectively.
- General safety guidelines, regulations, for contract workers are updated and all contract supervisors, owners and concerned employees are trained for follow up.



## Fire & Safety Training:

### Induction Training

- Fire & Safety Training is imparted to all employees at the time of Recruitment.



(Fig showing – Employees attending F&S Training)

### Refresher F&S training and live fire training

- Periodical one-day refresher training programme on Fire & Safety is conducted every year for employees, Indcoserve workers and CISF personnel.



(Fig showing - while Fire fighting training is imparted)



## **Safety Promotional & Motivational Activities:**

To involve and orient the employees towards safety, CPCL is adopting an array of safety motivational & promotional activities.

### **Celebration of Safety day and Observance Fire Services Day**

- To commemorate the 35<sup>th</sup> National Safety Day, Essay Contest, Slogan Contest, Elocution Contest (Tamil & English), was conducted for employees and Essay and Elocution contest for INDCO workmen. To motivate employees on importance of wearing PPE's a competition on wearing Fire proximate suit with Self Contained Breathing Apparatus was also conducted.
- Fire Services day & week was observed on April 14<sup>th</sup> 2005.

### **Five minute Safety Talk**

The Supervisor of the individual sections gives a safety talk to their staff for about five minutes. Safety talks in various topics are compiled in a book and this is issued to all sections heads and department HOD's. This is reviewed during every QEHS audit meeting. The safety officers at the beginning of every shift give similar five minutes talks during shutdowns and turnarounds through public address system.

### **Safety Messages on Birthday**

A greeting containing safety message is sent to all employees on their birthday. The birthday wishes are also displayed in the intranet as a safety motivation.

### **Other Activities**

- As environment protection and pollution prevention activity in the Chennai Port, oil companies are assisting the Chennai Port Trust to set up tier I oil spill combating facilities in the port premises. As we are the major user of the port, we have taken a lead role in getting a MoU signed between Chennai Port and oil companies as well as procurement of the oil spill response equipments.



## OCCUPATIONAL HEALTH SERVICES

**OHS clinical laboratory (Bio chemistry) has been accredited by NABL (National Accreditation Board for Testing and Calibration laboratories) in accordance with ISO/IEC 17025:1999.**

This means that the OHS clinical laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results.

CPCL OHS clinical laboratory is the only one among public sector organisations in the country to get such as formal recognition by an accreditation body in accordance with international criteria.

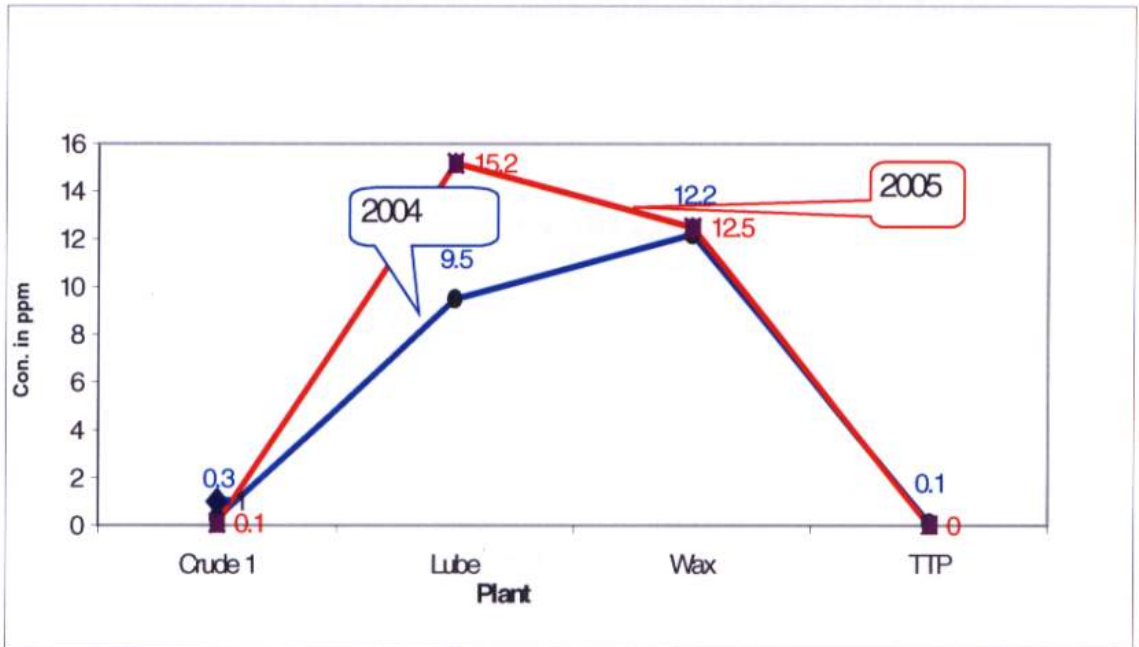
### Work Environment Monitoring Data Analysis : 2005 – 06.

- ◆ The qualitative and quantitative evaluation of employees' exposure to work environmental hazards – i. Chemicals (hydrocarbons, amines, ketones, etc.), ii. Gases (CO, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, Cl<sub>2</sub>, etc.), iii. Heat stress and iv. Noise, are monitored as per schedule. The occupational hygiene study of the work environment results show similarities of the observations made over the past years. Necessary corrective actions have been implemented for control of hazards, whenever they exceeded the TLVs.
- The work environmental concentrations of aliphatic hydrocarbons – butane in LPG areas and N – hexane in hexane plant and total hydrocarbons measured as n – hexane in Crude units, Hydrogen, FCCU, HGU, OHCU, ETPs and Tank farm areas have not exceeded their respective threshold limit values.
- The work environmental concentration of benzene in asphalt loading areas, hydrogen plants and toluene in lube block have not exceeded their respective threshold limit values.
- The work environmental concentration of MEK in lube block and MIBK in wax plant have not exceeded their respective threshold limit values.
- The work environmental concentration of MEA and DEA have not exceeded their respective threshold limit values.
- The work environmental concentration of furfural in lube plant has not exceeded its threshold limit values.
- The mean concentrations of CO, SO<sub>2</sub>, Ammonia, H<sub>2</sub>S observed at different plants, has not exceeded their respective threshold limit values.

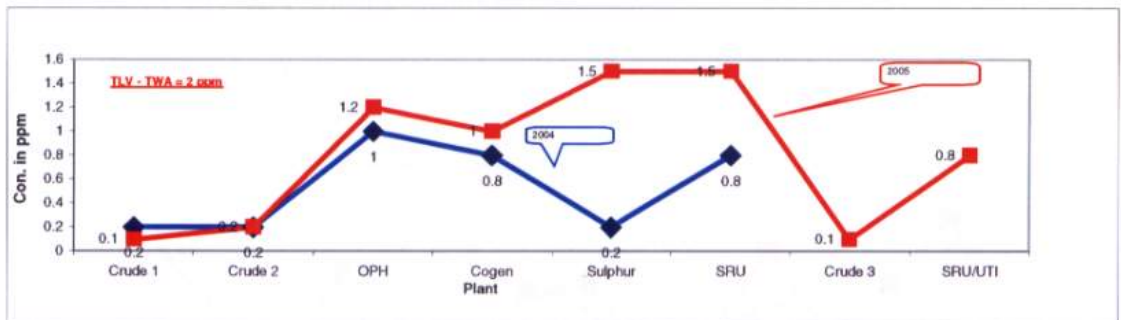




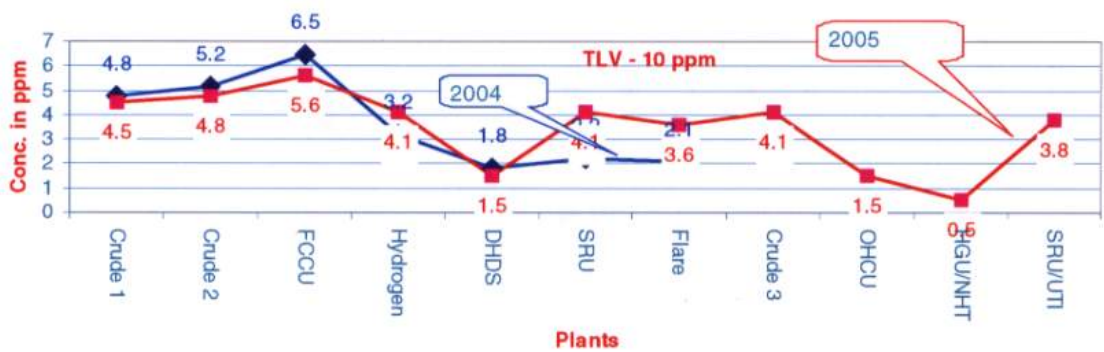
## MEAN CONCENTRATION OF AMMONIA IN DIFFERENT PLANTS



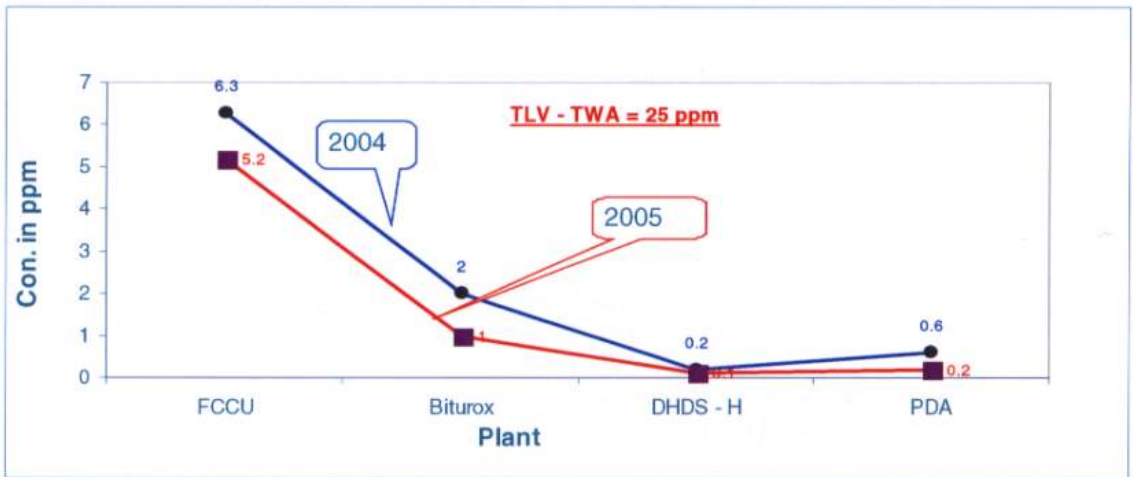
## MEAN CONCENTRATION OF SO<sub>2</sub> IN DIFFERENT PLANTS



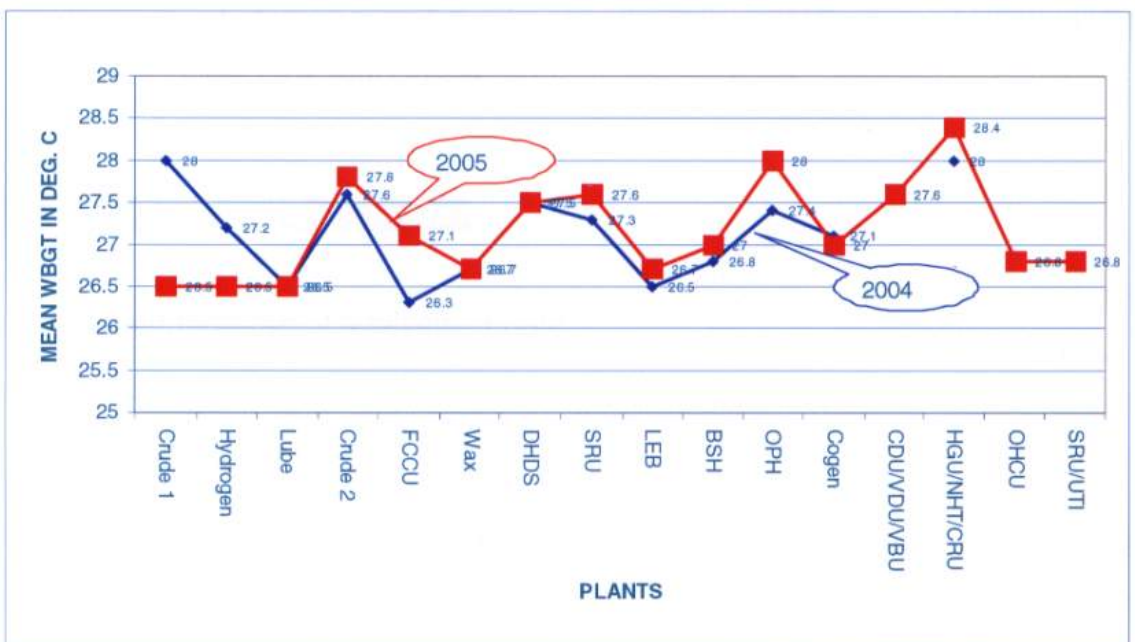
## MEAN CONCENTRATION OF H<sub>2</sub>S IN DIFFERENT PLANTS



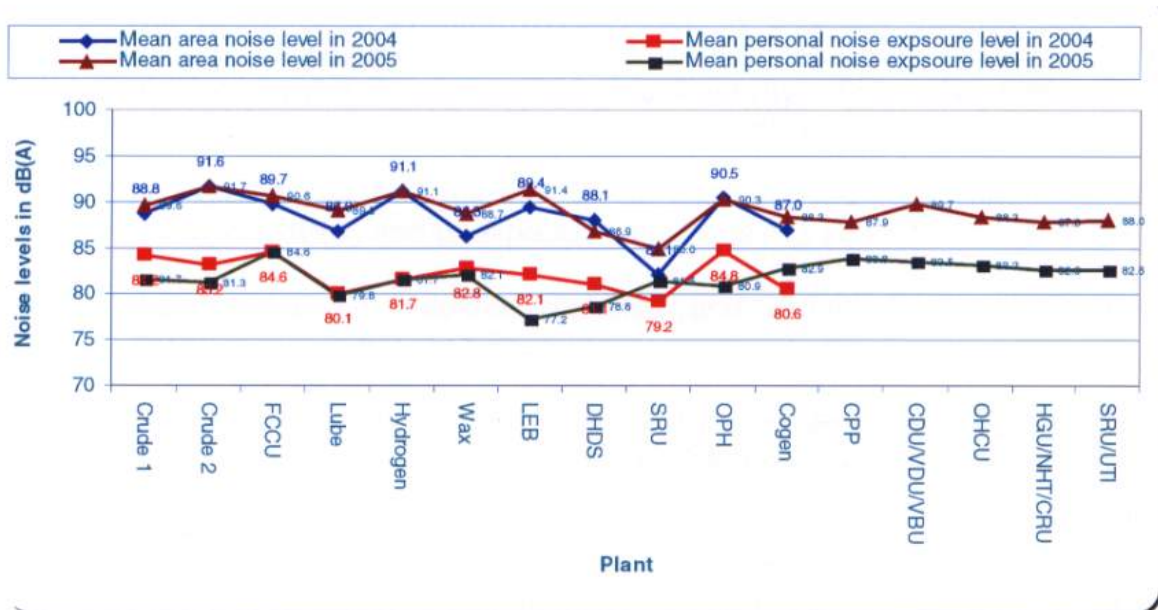
## MEAN CONCENTRATION OF CO IN DIFFERENT PLANTS



- The estimate of **heat stress** has not exceeded the permissible occupational heat exposure threshold limit value (29.5.C), for the nature and duration of work performed by the operating personnel.



- The measured average true accumulated noise exposure of the individual's, received by the unprotected ear, in different plants has not exceeded the TLV-TWA[90 db(A)]



- Improvement of the luminance level (intensity of light ) has been recommended in some of the localized areas – MTF areas, LPG bulk filling areas, LUBE tank farm areas.

## Health surveillance of employees

The Salient features of analysis of data.

- ◆ No man hour is lost due to occupational illness. Total man hours worked – 3436554 hrs.
- ◆ About 70 % employees have been covered under the periodic health surveillance program.



## The findings:

- The prevalence of hypertension is 12.2%, and diabetes mellitus is 10.8%; increase in prevalence with increasing age.
- The relationship between hypertension & diabetes mellitus and family history of illnesses (32%) and life style factors { smoking -13.5%, alcohol – 1.6 %, inadequate physical activity - 55%; NV diet - 70.2%, overweight - 37.7%, obese - 7.2% } is statistically significant at 5%.
- The prevalence of hypertension among exposed to occupational noise ( $83.6 \pm 4.4$  dB(A)) and unexposed persons is **not** statistically significant.
- The relationship between diabetes and ischaemic heart disease is statistically significant at 5%.
- Lipid abnormalities (53.5%) is present in all age groups; the relationship between lipid abnormalities and hypertension and diabetes mellitus is statistically significant at 5%.
- The association between high frequency hearing loss and cardio vascular risk factors – lipid abnormalities, hypertension, diabetes mellitus is observed.
- The use of high frequency hearing loss as a potential marker for cardio vascular disease, because of similar risk profiles and etiological mechanisms is being followed up.
- Our observations confirm the usefulness of physical exercise regularly
- Most of the employees show that they are managing stress well; they control their mood and take positive action to prevent negative effects.
- The measures of pulmonary function do not show any abnormalities over the range of exposures to particulates and inorganic pollutant gases which have been measured.
- Visual performance screening in order to maintain an individual's visual abilities to the highest possible levels of efficiency on the job.
- The results of monitoring audiograms (done annually) were compared with the base line audiogram to check for any change in hearing sensitivity for both exposed group occupational exposure to noise of  $\{(89.1 \pm 1.8 \text{ dB(A)})\}$  and unexposed persons. The findings do not show any significant threshold shift.



## Health Education and training of employees

- Regular health education of employees – 5 programmes have been conducted. In addition, 6 programmes were organised as a part of Fire & safety training to CISF employees and 6 programmes were organised in specific plant areas, suited to the requirement of the plant.
- Four issues - “**Health and Environment Periodical**”, both in **English and in Tamil**, were published quarterly on the following topics and distributed to all employees:
  - **Exercise; Kyoto protocol**
  - **Stress; World environment day**
  - **Rectal bleeding; VOCs at homes**
  - **Heartburn; Neck pain; Type II DM**

## Health Promotional activities

- Consultancy service by visiting specialists in Cardiology and Diabetology once monthly.
- Health screening of women employees at workplace including specialist's examination.
- Special campaign on “Look after your Heart, Diabetes, Eye Care” - Medical examination, lecture, booklet, posters and banners.

## Scientific Reports

So far 25 scientific papers have been presented in different national conferences/seminars.

Following papers were presented in 2005:

- Volatile Organic Compounds – Exposure consequences & prevention
- Study of work related Firstaid/Medical aid injuries Characteristics and Remedial follow-up.
- Quantitative risk assessment of manual material handling at work and implementation strategies in reducing physical work demands.



## Health Information System

- Work environmental monitoring data, medical information, hazard information on each chemical exposure profile and locations where potential exposures can occur.
- Documentation of scientific publications that appear in journals - both national & international

## Resource centre

- Development of guidelines for Occupational Health Monitoring in Oil & Gas Industry – OISD – GDN 1966.
- A three day training programme on “**Occupational Health Nursing**” was conducted to nurses from other oil industries from 28 to 30 Sep.2005 at OHS. 8 nurses from different industries participated in the program.
- Training of students of local academic institutions to get themselves familiarised with the activities of OHS.
- Professional & technical support and assistance to other industries - TVS Motor Co. Ltd., Hosur, in the evaluation of work environmental hazards.



## GREEN BELT AT CPCL

The greening of CPCL is another facet of environmental consideration. Planting and maintaining thousands of trees and shrubs form a green belt around the refinery. The green belt developed mitigates fugitive emissions, dilutes accidental releases and balances eco environment besides beautifying the surroundings.

His Excellency The President of India, **Dr.A.P.J.Abdul Kalam** visited the Tsunami affected areas in Nagapattinam District on 30 June 2005. During his stay, he stayed at CPCL – CBR's Guest House.

As a mark of remembrance, The President planted a sapling at CBR Housing Complex.



## Tree planting at Manali:

Project	Total number of saplings	Locations
LEB & CPP	50000	Administration, R&D, ETP 2, CISF quarters, B canal area
DHDS	39750	ETP 1 & 2, TTP and cogen plant
Refinery III	8000	Expansion refinery area, flare area
Others	Landscape, shrubs	In many areas within the refinery



## RAIN WATER HARVESTING:

CPCL has institutionalized comprehensive network of rain water collection, conveyance, storage and regulated recirculation system for rain water during the implementation of each project in the refinery.

The storm water collection system is well developed with wide concrete/masonry canals. These canals are ultimately connected to storm water sumps, surge tanks and ponds.

Storm water sumps are provided for a hold up capacity of 30 minutes of designed rain water flow of 5700 m<sup>3</sup>/hr.

An estimated 80000 m<sup>3</sup> of storage capacity is available for rain water collection in tanks and ponds.





## CORPORATE SOCIAL RESPONSIBILITY

CPCL's commitment towards the Corporate Social Responsibility is rightly manifested in substantial contributions to various welfare and community development programmes, particularly, in the vicinity of its refineries. The "Tsunami", which attacked the south eastern coast of India on 26.12.2004, has caused death and destruction of a magnitude that required relief and rehabilitation on a massive scale. Nagapattinam, Cauvery Basin Refinery is located, was one of the worst affected areas.

CPCL joined hands in the humanitarian task of helping the victims and provided various household articles, like vessels, kerosene-stove, blankets, mats and dresses to the affected people near Nagapattinam on an emergency basis. In addition, we have contributed Rs.2.5 crore to the Prime Minister's National Relief Fund to provide relief and assistance to the 'Tsunami' victims. The employees of CPCL contributed their one-day salary to the Chief Minister's Public Relief Fund for the above cause.

CPCL introduced a Scholarship Scheme to the eligible and the needy students of the educational institutions in the vicinity of its Manali Refinery.

CPCL educational trust sponsored by CPCL runs an Industrial Training Institute(ITI) and a polytechnic at Manali near the refinery. A full time Diploma Course in Petroleum Engineering, which is first of its kind in the country, is being conducted by the polytechnic. Another Diploma Course, viz., Diploma in Mechanical Engineering(Full time) is also being conducted by the polytechnic. The Diploma Course in Petroleum Engineering has been recognized and registered by Economic Development Board, Singapore.

### Other notable Community development programmes sponsored by CPCL are:

- ❑ Eye camps for cataract identification in the Manali neighbourhood in association with Sankara Netralaya, a renowned eye-care institution; conducted cataract operations for 105 identified cases as a follow-up.
- ❑ Promotion of Sports by conducting a football tournament for the youth of Manali and neighbouring villages at Chinnasekkadu.
- ❑ Provision of Laboratory equipment and furniture to the needy educational institutions near the Manali Refinery.
- ❑ Provision of Computers to Grama Seer Amaippu Seva Sangam, Manali.
- ❑ Providing Tailoring and Embroidery Training programme for the women of Manali and Chinnasekkadu villages with a view to equip them for self-employment.
- ❑ Running of the health centre, crèche and library at Manali Village.



## CELEBRATION OF WORLD ENVIRONMENT DAY 2005

5<sup>th</sup> June is World Environment Day. Each year on this designated day, we focus our attention on Environment and recognize positive environmental programs and initiatives.

### **The Theme for World Environment Day 2005 – “Green Cities – Plan for the Planet”**

Focus on the challenges raised by one of the major trends of our times – the rapidly increasing proportion of people living in urban environments. In the next quarter century, almost all population growth will occur in cities, most of it in less developed countries. By 2030, more than 60% of the World’s population will live in urban areas. The environment consequences of urban growth is considerable. Cities are prolific users of natural resources and generators of waste. They produce most of the green house gases that are causing global climate change. They often degrade local water quality, deplete aquifers, pollute the marine environment, foul the air, consume the land, thereby devastating biological diversity.

CPCL used this opportunity of World Environment Day raising awareness of environment among the employees and other by a range of activities. MD, Directors and others took part in the events organized on 6<sup>th</sup> June 2005. The Events included are:

- Awareness Campaign



- Award presentation of environment related activities
- Clean-up campaigns



Details of the exhibition conducted are given below:

<b>AGENCY</b>	<b>DETAILS</b>
M/s. Membrane Technologies Limited	Environmental Pollution Control Products & Services
M/s.Doshi Ion Exchange & Chemical Industries Ltd.	-do-
M/s.VA Tech Wabag Limited	-do-
M/s.Chemito Instruments	Environmental Pollution Monitoring Instruments
M/s. Earth Care	Energy efficient lamps, Solar appliances, Eco-friendly paper products, etc.

## ENVIRONMENTAL LITERACY DRIVE IN NEIGHBOURING VILLAGES & SCHOOLS.

To create environmental awareness to the cross section of the society was implemented through involving the youths and children.



## VISIT OF SUPREME COURT MONITORING COMMITTEE ON HAZARDOUS WASTE MANAGEMENT

The Supreme court monitoring committee on Hazardous waste management visited CPCL on 31<sup>st</sup> January and again in July 2005. The committee held discussions with the management on hazardous waste management system in place in CPCL. Later they visited the different areas in the refinery.



## VISIT OF LOCAL AREA ENVIRONMENT MONITORING COMMITTEE

The members of the Local Area environment monitoring committee for Manali, a sub committee of the Supreme court monitoring committee on hazardous waste management visited CPCL on 11<sup>th</sup> June 2005. The members went around the refinery and inspected TPM model plant, Ambient air quality monitoring station, ETP 2 and MTF areas. The members discussed with GM (i/c) and others about further stringent measures to be adopted to protect the environment.



## VISIT BY ESTIMATE COMMITTEE ON ENVIRONMENT

An 18 member Estimates Committee on Environment of Tamil Nadu Legislative Assembly visited CPCL on 17<sup>th</sup> August 2005. They were briefed about CPCL's initiatives and achievements in the field of Environment Management. Subsequently the team visited the TTP – UF – RO plant and Continuous Ambient Air Quality Monitoring Station. The team complemented the efforts of CPCL in Environmental management.



## QEHS AUDITS

Chennai Petroleum Corporation Limited (CPCL) has been certified to conform to the requirements of **Environment Management System (EMS) ISO 14001:2004** on 18<sup>th</sup> April 2006, **Quality Management System - ISO 9001:2000** and **Occupational Health & Safety Assessment Series - OHSAS 18001:1999** on 30<sup>th</sup> November 2001. All the three systems are now integrated as **Quality, Environment, Health, Safety System (QEHS)** and certified upto July 2007.

Two surveillance audits were conducted by the certifying agency during the year 2005 – 06.



**Chennai Petroleum Corporation Limited**  
(A group company of IndianOil)



**QUALITY**



**ENVIRONMENT**



**HEALTH & SAFETY**

**POLICY**

Good performance in respect of Quality, Environment and Occupational Health & Safety is paramount to the success of our business of “**Manufacture and Supply of Petroleum Products**”.

**We commit ourselves to achieve this by:**

- Working towards the prevention of Occupational injury and ill health, loss or damage to property and environment by defining and reviewing objectives and targets.
- Continually improving our processes, products and services in a safe manner.
- Complying with applicable legal and other requirements in a socially responsible manner.
- Training and communicating the policy to employees and other interested parties with emphasis on their individual QEHS obligations.



**R. Sankaran**  
Director (Technical)



**N.C. Sridharan**  
Director (Finance)



**A. Kasturi Rangan**  
Director (Operations)




**S.V. Narasimhan**  
Managing Director

11.02.2005



## Annexure

- CPCL Refinery – A profile
- Awards and Accolades 2005-06
- ISO 14001, ISO 9001 and OHSAS 18001 certificates
- Activities of the World Environment day 2006



**Chennai Petroleum Corporation Limited**

### *Vision*

*Chennai Petroleum Corporation will be  
a world class Energy company,  
well respected and consistently profitable,  
with a dominant presence in South India.*

### *Mission*

*To maximize profit through*

- *the manufacturing and supply of petroleum products and*
- *other related businesses*

*in a reliable, ethical and socially responsible manner*



## CHENNAI PETROLEUM - A PROFILE

Chennai petroleum corporation ltd (earlier known as Madras Refineries Limited) was established as a Public Sector Undertaking in 1965, at Manali near Chennai (the then Madras). The J.V. partners were Government of India (G.O.I.), National Iranian Oil Company, Iran and Amoco, USA. Amoco disinvested in 1985 in favor of G.O.I. M/s Indian Oil Corporation purchased the 51.8% share held by GOI in March, 2001, thus making CPCL a group company of IndianOil.

Capacity increase over the decades is represented in the table below:

Year	Activity	Capacity, MTPA
1969	Initial capacity (Ref-I)	2.5
1980	De-bottlenecking of Ref-I	2.8
1984	Commissioning of Ref-II (doubling)	5.6
1993	De-bottlenecking of Ref-II	6.5
1994	Commissioning of CBR	7.0
2003	De-bottlenecking of CBR	7.5
2004	Commissioning of Ref-III	10.5

### Environment Conservation

CPCL ever since its inception has been methodically planning and implementing several environmental conservation measures. A dedicated Environment Management Team functions exclusively to plan, implement, operate and monitor all environment-related activities.

CPCL uses the following multi pronged approach towards managing its Environmental System:

- Use of cleaner technology in Refinery process operations
- Continuous operation of pollution control facilities
- Creation of environmental awareness amongst all employees

At its Plants, CPCL has switched over to LSHS fuel - far less polluting than the high sulphur used earlier.

A new Diesel Hydro Desulphurising unit with a capacity of 1.8 MTPA was commissioned in 1999 at Manali Refinery, to produce HSD with 0.05% sulphur content as stipulated by environmental considerations.

A new Hydro-cracker unit is set up as part of Refinery III to increase the production of high value products and to meet the specification of auto-fuel products - Bharat-II and Euro-III equivalent environmental standards.



Sulphur Recovery Units installed results in substantial reduction of sulphur dioxide emission.

A Flare Gas Recovery Unit is installed to recover hydrocarbons from the flare system.

Low NOx burners are used in boilers and process furnace heaters.

New DeNOx technology has been implemented for the first time in India, in Refinery III process heaters to convert NOx emissions to inert nitrogen.

Eight numbers of state-of-art 'Continuous Ambient Air Quality Monitoring Stations' are installed.

Continuous Stack Gas Monitoring units in all major refinery stacks have been installed.

Continuous operation of three Effluent Treatment Plants dedicated to each of its three refineries. The total capacity of the ETPs is about 550 KL/Hr and is operated on a continuous basis.

The treated water from Effluent Treatment Plants at CPCL meets MINAS standards regularly.

Part of the treated effluents is recycled for greenbelt development, fire water make up, chemical preparation and other peripheral applications in the Refinery Complex.

The remaining treated effluents are reclaimed for refinery process reuse through "Zero Discharge scheme using technologies of Ultrafiltration and Reverse Osmosis.

CPCL implemented in 1991 a 2.5 MGD reclamation of city sewage water by employing conventional physico-chemical based tertiary treatment process followed by membrane separation of contaminants through reverse osmosis.

The debottlenecking of this plant has been done by replacing the conventional treatment with latest technology of Ultra-filtration. This unique project also indirectly helps in resource saving of metro water which is diverted for the use by the city population and also avoids effects of disposal of partially treated sewage into the environment.

The greening of CPCL and its environs is another facet of environmental conservation. Planting and maintaining thousands of trees and shrubs form a green belt around CPCL's plants. This mitigates fugitive emission, dilutes accidental releases and balances eco-environment-besides beautifying the surroundings.





## AWARDS AND ACCOLADES

### Awards / Certificates:

YEAR	AGENCY	DETAILS OF AWARD
2005	Confederation of Indian Industries (CII)	Participation Certificate - Leadership & Excellence Award in SHE
2005	Greentech foundation	Gold award for outstanding achievement in environment management in Petroleum sector
2005	Ecology Leadership award	Rotary club of Chennai
2004	Confederation of Indian Industries (CII)	Appreciation Certificate - Leadership & Excellence Award in SHE
2003	Confederation of Indian Industries (CII)	Appreciation Certificate - Leadership & Excellence Award in SHE
2003	GreenTech Foundation	Silver award for outstanding achievement in environment management in Petroleum sector
2003	The Energy & Resources Institute (TERI)	Second Prize of "Corporate Environmental Award 2001-02"
2002	Indian Chemical Manufacturers Association	Certificate of Merit 2002
2002	School of Entomology & Centre for Natural Resources	Loyola Environmental Award 2002
2001	World Environment Foundation	Golden Peacock Environmental Management Winner Award
2000	Central Pollution Control Board (CPCB)	Award "Technology and Environment Protection in National Sector" at Enviro-International Exhibition.
2000	Indian Science Congress - CSIR	Appreciation Certification
1998	Enviro International	Appreciation Certification
1999	World Environment Foundation	Golden Peacock Environmental Management Runners Up Award
1999	Tamilnadu Pollution Control Board (TNPCB)	State Environment Award for CPCL - CBR Unit
1999	CleanTech Environment	Appreciation Certification
1998	Enviro International	Appreciation Certification



# QEHS CERTIFICATES





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## CPCL to pay 120% Dividend for 2004-05



Chennai Petroleum Corporation Limited (CPCL) has declared highest-ever dividend of 120% for the year 2004-05. This was announced by Mr. S. Behuria, Chairman, IndianOil Group Companies, at the Company's 39th Annual General Meeting (AGM) in Chennai on August 24. CPCL has been maintaining uninterrupted dividend paying record for the 34th consecutive year.

Mr.R.Sankaran, Director (Technical) and Managing Director (i/c), Mr.N.C.Sridharan, Director (Finance), Mr.A.Kasturi Rangan, Director (Operations), CPCL Mr.A.M. Uplenchwar, Mr.B.N.Bankapur, Mr.L. Sabaretam, Mr.K.Suresh, Mr.Venkatraman Srinivasan, Mr.M.Vaezi, Mr.M.B.Samiei Khonsari, Directors on the Board of CPCL, Mr.R.Naray-

(Continued on page 4)

## Dividend paid to IOCL

CPCL has paid Rs.92,71,82,400 to IOCL being the dividend for 2004-05 on the equity holding of Rs.77,26,52,000 held by IOCL. A Demand Draft for this amount was

presented by Mr.R.Sankaran, Director (Technical) and Managing Director (i/c), CPCL to Mr.S.Behuria, Chairman, IndianOil Group Companies in New Delhi on August 29.



## Special Component Plan / Tribal Sub Plan Furniture / Lab materials distributed



CPCL under its Special Component Plan / Tribal Sub Plan, has distributed materials worth Rs.6.72 lakhs to Government Adi-Dravida Welfare Girls Higher Secondary School, Vadagarai, near CPCL's Manali Refinery. The materials were distributed by Mr.S.V.Narasimhan, Managing Director, CPCL, at a function at the Govt. Adi-Dravida Welfare Girls Higher Secondary School, Vadagarai on April 13. The materials include 205 tables and benches costing Rs.4.70 lakhs for accommodating a minimum of 820 students, Laboratory equipment/items costing Rs.1 lakh and school bags and geometry boxes to school students worth Rs.1.02 lakhs. Mr. Sundar, President, Vadagarai Panchayat Union, Ms. Shantha Kumari, District Adi-Dravida Welfare Officer, Mr. M. Dayalan, General Secretary, Mr. G. Aravindan, President, MRL SC/ST Employees' Welfare Association, and Mr.A.Kasturi Rangan, Director (Operations), CPCL, felicitated. At the outset, Mr. A.Loyola, Deputy General Manager (Personnel), welcomed the gathering. Mr.S.Thangavelu, Chief Manager (Administration), proposed a vote of thanks. Mr.A.Kumar, Senior Manager (Administration), compered the proceedings. Senior officials of CPCL were present on the occasion.

**Training classes on Tailoring & Embroidery for women**



As a part of CPCL's community development activities, for the first time, self-employment training classes for women in and around Manali village was organised in association with Thirumathy Sarojini Varadhappan Magalir Sangam, Chennai, a Non Government Organisation. Under SCP/TSP for the year 2004-05, an amount of Rs.1.5 lakh has been earmarked for providing training relevant for the development of women which would lead to employment.

The training classes were inaugurated by Mr.S.Velumani, General Manager (Corporate Planning), on March 31. Speaking on the occasion, Mr.Velumani stressed the importance of such training classes as they are arranged for developing talents / skills for a better way of living. About 400 women members of various Self Help Groups who have undertaken a lot of such developmental activities under Government of Tamil Nadu Scheme, participated in the above programme.

Mr. V.Srinivasan, General Manager (HR) & Company Secretary, Mr.A.Loyola, Deputy General Manager (Personnel), Mr.G.Aravindan, President and Mr. M.Dayalan, General Secretary, MRL SC/ST Employees' Welfare Association, felicitated.

Administration Department co-ordinated the above programme.

**Handing over of school furniture and other items to Villivoyal School and students**



As a part of the community development activities 26 sets of Steel Benches / Tables, 4 numbers Ceiling Fans, one Godrej Store Well, Lunch Plates with tumblers, School Bags and Pencil Boxes, were distributed

(Continued on page 8)

## Eye Camp conducted



A free eye camp was conducted at Nagapattinam on April 24 with the assistance of Lions Club, Nagore and Nagapattinam and Aravind Eye Hospital, Pondicherry. The eye camp was inaugurated by Mr.N.K.Natarajan, General Manager (CBR). About 500 people turned up for the eye camp and out of them 80 persons were selected for cataract surgery and taken to Aravind Eye Hospital.

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## Medical Camp conducted

As a part of the Community Services activities, a general medical camp was conducted in association with M/s. Beach - Chennai Hospital, New Washermanpet, on May 8 at Primary School, Kattuppalli for the benefit of the people living in Kattuppalli and neighbourhood. In addition, CPCL organised a function for handing over school bags, uniforms, lunch plates etc. to students of Kattuppalli Primary School and 3 colour televisions to Kattuppalli, Kaalaanji and Kuppam villages (Minjur Union).



3 The function was inaugurated by Mr. V. Srinivasan, General Manager (HR) & Company Secretary. In his address, Mr. Srinivasan explained the various activities carried out under community development activities. Mr. R. Anand, General Manager (Projects) stressed the importance of education and personal hygiene as essential for healthy living. Mr. S. Asokan, Deputy General Manager (Corp. Plng.), Dr. V. Swaminathan, Chief Medical Officer, Mr. M. Dayalan, General Secretary, MRL SC/ST Employees' Welfare Association felicitated.

Dr. R. Kanagasabapathy, Managing Director of M/s. Beach - Chennai Hospital, led the medical team for conducting the medical camp. 315 people of Kattuppalli and neighbourhood were benefited. Administration Department co-ordinated the various activities. At the end of the function, 600 food pockets were distributed to people living in Kattuppalli village.

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(Continued from first page)

As part of the pre-project activity the site grading work was commenced with the Ground Breaking Ceremony on June 14 by Mr.S.V. Narasimhan Managing Director in the presence of Mr.R.Sankaran, Director (Technical), Mr.N.C.Sridharan, Director (Finance), Mr.A.Kasturi Rangan, Director (Operations) and senior officials.

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## **Trade Union Developmental Programme**

A one day training programme was jointly conducted for the Office Bearers and the Committee Members of CPEU and MRAEU in Chennai on June 25. Mr.V.Natarajan, General Manager (Finance), inaugurated the programme. In his address, Mr. Natarajan stressed the role of Unions in fostering positive industrial relations in the Organization.



Speaking on the occasion, Mr.V.Srinivasan, General Manager (HR) & Company Secretary exhorted the participants to share the knowledge acquired in the training programme with rest of the employees.

Mr. P.Sugumaran, General Secretary, CPEU and Mr. P.Venkatesan, President, MRAEU, speaking on the occasion, thanked the Management for conducting such a training programme as it satisfied the developmental needs of the people.

Introducing the theme and contents of the programme, Mr. A.Loyola, Deputy General Manager (Personnel), highlighted the need for togetherness among the employees for realising the goals of the Organisation and that the Unions are essentially partners in progress.

Mr.S.Asoken, Deputy General Manager (Corporate Planning) made a presentation on the on-going projects and the future plans of the Company. Mr. Ravi A.N. Ramanathan, a Faculty handled a session on communicative leadership and teamwork. He had enthused the participants through various experiential learning exercises. During his session Mr.C.L.Ramakrishnan, laid stress on the need for inculcating values such as devotion to duty, integrity, right conduct, etc. for achieving organizational excellence.

## Materials distributed

As part of the Community Development activities, CPCL organized a function at Thiruvellavoyal on October 6 to distribute 2 colour televisions to Thiruvellavoyal village and 350 numbers of pencil box to Minjur Panchayat Union Primary School students, Thiruvellavoyal.



Mr.S.Velumani, General Manager (Corporate Planning), CPCL, presided over the function and distributed the 2 colour televisions to the President, Thiruvellavoyal Panchayat Union and 350 pencil boxes to the students. Speaking on the occasion, Mr.Velumani stressed the importance of communication in daily walks of life and the role played by television in bringing the world affairs to every home and how students should benefit by them for their betterment. Mr.V.Karunakaran, Deputy General Manager (Administration, Education & Training), felicitated. Mr.R.Kumar, Senior Manager (Administration), Mr.Ravichandran, President, Thiruvellavoyal Panchayat Union were present on the occasion. Teachers, parents and a large number of students participated in the function. Administration Department co-ordinated the programme.

*Indolence is a delightful but distressing state; we must be doing something to be happy.*

- Mahatma Gandhi

## SCP at CBR Materials distributed

As part of CPCL CBR's Community Development activities, uniforms and benches were distributed to the schools in the vicinity of Cauvery Basin Refinery. At a function organised in this connection at CBR Housing complex on October 7, Dr.J.Radhakrishnan, District Collector, Nagapattinam, participated and distributed the materials to the nearby schools. A sewing machine was also given to a poor family during the function under Tribal Sub Plan (TSP). Speaking on the occasion, the District Collector, lauded the community development activities undertaken by CPCL in the neighbourhood areas of the Refinery.



Mr.N.K.Natarajan, General Manager (CBR), participated in the function and welcomed the gathering. Mr.M.Dayalan, General Secretary, MRL SC/ST Employees' Welfare Association, presented a report on the activities of Special Component Plan (SCP). Mr.G.Aravindan, President, MRL SC/ST Employees' Welfare Association, felicitated.

Teachers and students of the beneficiary schools and a large number of employees of CBR participated in the function.

Mr.G.Murugaiyan, Deputy General Manager (Operations and Technical) proposed a vote of thanks. Mr.K.Selvam, Deputy Manager (Personnel & Administration), compered the programme.



## Donated



Leading Organisation for Redressing Problems of Deprived (LORD) is a Non Governmental and Non-profitable Social Welfare Organization engaged in redressing the problems of mental illness for more than a decade. At the rehabilitation center, located at Pudur, Ambattur, Chennai, mentally retarded women are being treated for remedial measures. The NGO also conducts awareness programme at District level in Schools, Colleges and public regularly, on mental illness and provide counseling throughout Tamilnadu.

As a part of Community Development Activities, CPCL has donated Rs.50,000/- to M/s.LORD in promoting their mission / objective. Mr.V.Karunakaran, Dy. General Manager (Administration, Education & Training) handed over the cheque to the Managing Trustee, of LORD Dr.J.Jane Shanthakumar, on November 9 at their home.