



Application for
National Energy Conservation Award - 2007
(for Excellence in Energy Conservation and Management)

By
Bureau of Energy Efficiency

Sector: General



Organization:

GAIL (India) Limited
HVJ Pipeline Division, Vijaipur
Dist - Guna (M.P.), Pin – 473112

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ANNEXURE



GAIL (India) Limited
गैल इंडिया लिमिटेड

GAIL (India) Limited

VIJAIPUR

PROFILE:

GAIL (India) Ltd (Erstwhile Gas Authority of India Ltd), India's principal gas transmission and marketing company, was set up by the Government of India in August 1984 to create gas sector infrastructure for sustained development of gas market in the country. The organization has attained a leading status in the Indian business through its all-round contribution to the nation's gas-based economy with a countrywide presence of Pipelines, Gas Processing Plants, and Marketing network, including 60 work centers, which is efficiently operated by a young team of less than 3,500 employees, whose average age is 36 years.

GAIL is writing a new genetic code to achieve all-round excellence in our services towards the people and nature. Today GAIL has expanded into Gas Processing, Petrochemicals, Liquefied Petroleum Gas Transmission and Telecommunications. The company has also extended its presence in Power, Liquefied Natural Gas re-gasification, City Gas Distribution and Exploration & Production through equity stakes and joint venture participations. GAIL (India) Ltd is having it's one of the gas processing complex at Vijaipur, Distt. - Guna, MP.

The Gas Processing Unit (GPU) at Vijaipur is having 15MMSCMD (Million Standard Cubic Meter / day) processing capacity & has two Trains for processing the Natural gas. The total plant capacity is 6 Lakh MT of Liquid Hydro-carbon (LHC). The production capacity of different products is given below.

Sr.No	Products	Capacity (MT/Annum)
1	LPG	406000
2	Propane	130000
3	Pentane	42000
4	SBP Solvent	24000
	Total Capacity	602000

ENERGY MANAGEMENT POLICY:

GAIL (India) Ltd. Vijaipur is committed to explore new horizons in Energy conservation & to minimize the specific energy consumptions for our products to benchmark against International standards through

- **Adoption & up gradation of technology with main concern on energy efficiency & eco friendliness**
- **Benchmarking against the best practices of energy consumption & resource generation**
- **Nurturing a culture of participation & innovation amongst stakeholders & customers for continual improvement in Energy Conservation**
- **Imbibe practices of in house Energy saving with waste elimination & recycling mind-set**
- **Promote awareness among society to adopt renewable energy resources in a more user friendly manner, by cultivating responsive attitude among individuals, with spirit “Enough is not enough for Energy Conservation”, through motivation, training & encouragement to our employees.**

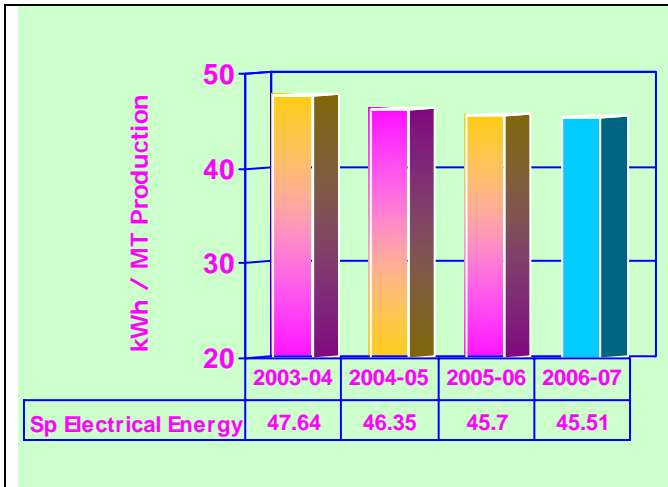
ENERGY CONSUMPTION DETAILS:

Year	Production (Lakh MT)	Capacity Utilisation (%)	Consumption of Energy Per Unit of Production BJ / MT (FUEL GAS)	Consumption of Energy Per Unit of Production kWh/ MT (Electricity)	Energy Cost In Rs. (Cr)	Energy Cost as percentage of Cost of Production (%)
2004-05	613676	101.94	4.73	46.35	43.33	8.72
2005-06	606598	100.76	5.69	45.70	74.09	10.76
2006-07	569417 *	94.59	5.42	46.51	86.35	10.65

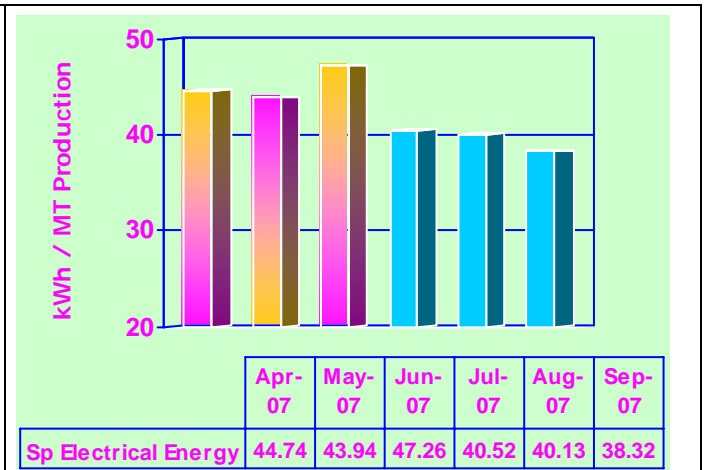
* Less Production, Reason - Gas supply was affected severely for a month, due to damage to ONGC Hazira installations occurred because of devastating flood in Surat.

In spite of less energy consumption in 2006-07, energy cost is more because, Energy Cost is increased due to rise in fuel gas price by 46 % w.r.t last year.

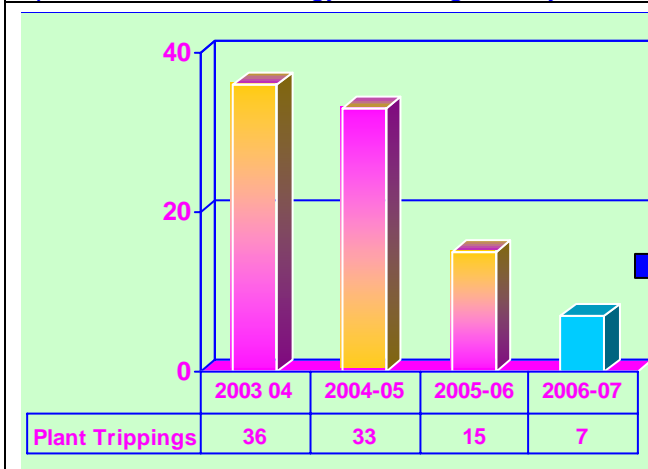
GRAPHICAL PRESENTATION



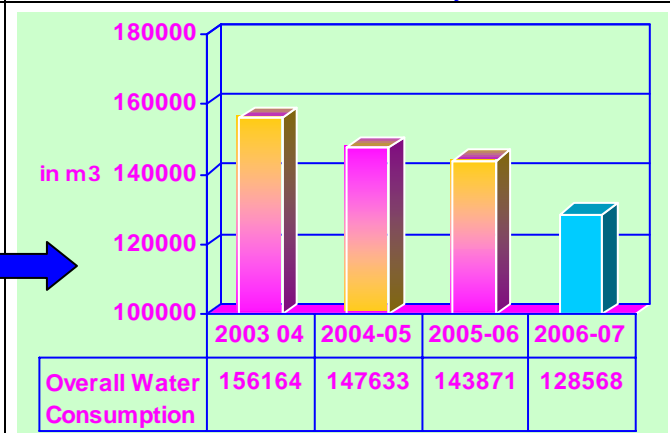
Specific electrical energy declining trend year wise



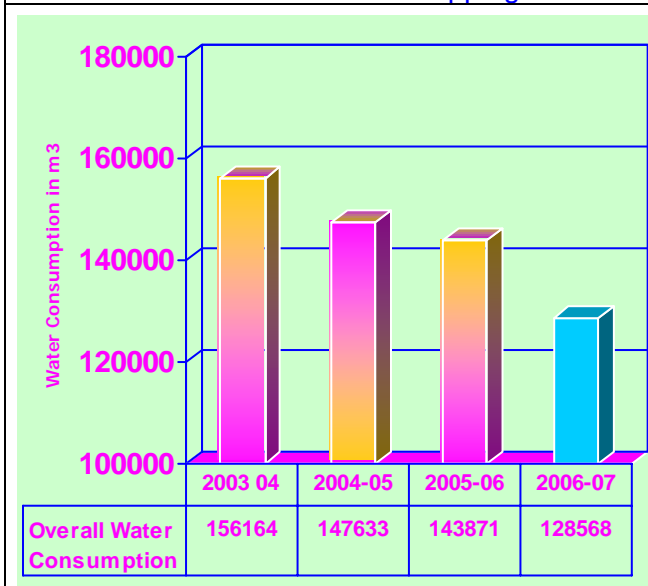
Specific electrical energy declining trend month wise for current financial year



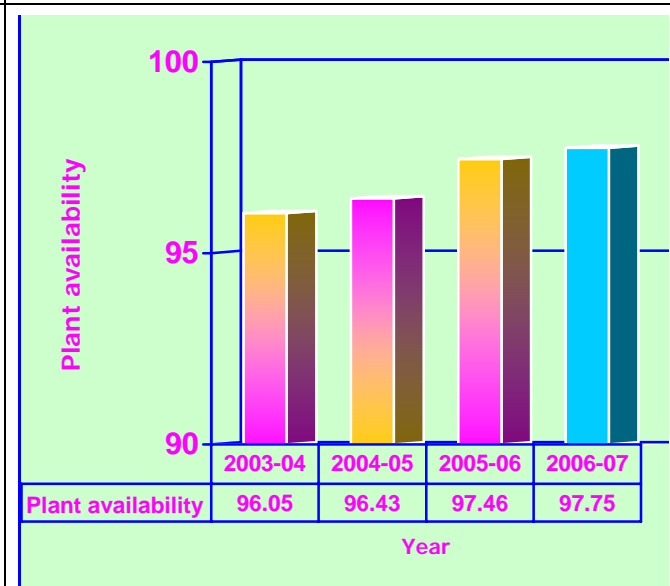
Reduction in Plant Tripping



Reduction in Flare Gas from Last two years , Increase in 2004-05 is due to DVPL commissioning



Reduction in Overall Water Consumption

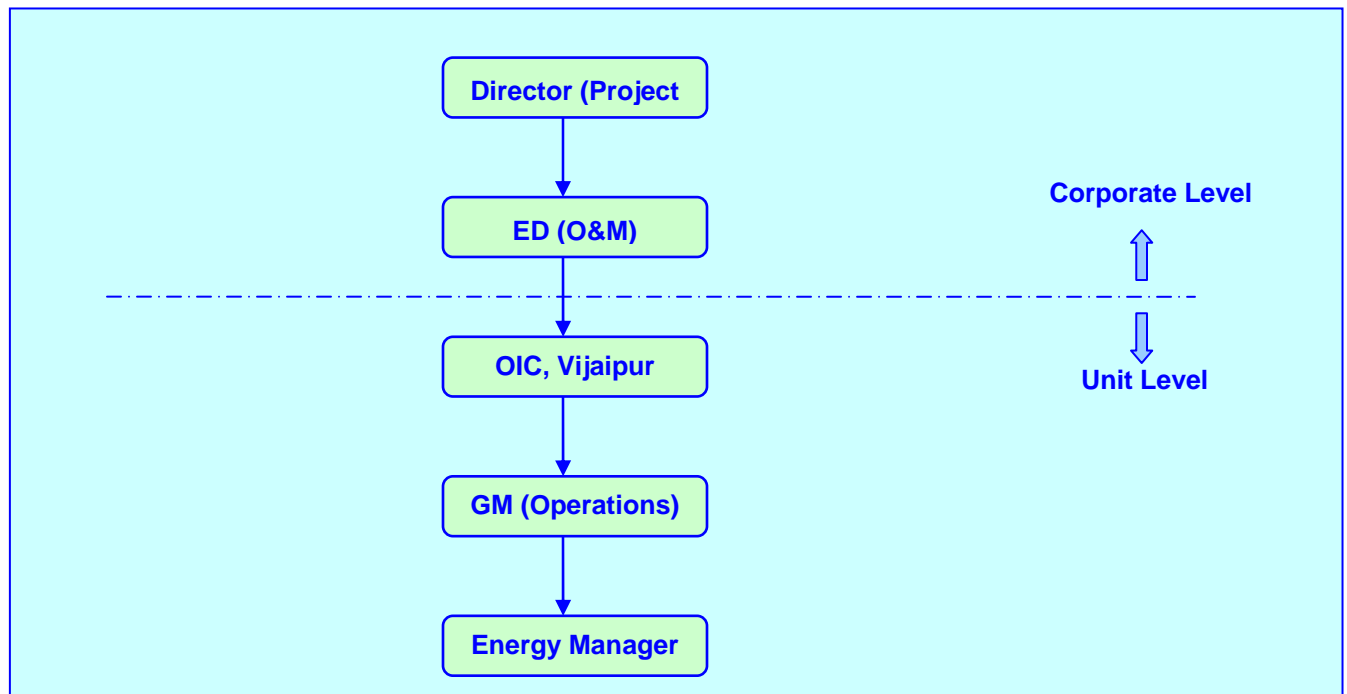


Increase in Plant availability

ENERGY CONSERVATION COMMITMENT POLICY AND SET-UP

The Energy conservation activities in the organization is being monitored by top management headed by Executive Director (O&M) assisted by his Team at corporate level for disseminating information related to energy conservation not only within GAIL but also to our valued customers. Being a front running organization in Natural gas Business the GAIL has also instituted gas conservation Award. The Institution of this award reflects commitment of our top management towards conservation of energy.

ENERGY CONSERVATION CELL STRUCTURE



MAJOR PROJECTS IMPLEMENTED FOR ENERGY CONSERVATION DURING 2006-07

1. Fuel Consumption reduction with implementation of Honeycomb shrouds



Honey comb shrouds are one of the critical hot gas path component meant to restrict the leak of hot gas between 2nd stage buckets (moving part) & 2nd stage shrouds (stationary part) by maintaining minimum clearances, which in turn causes more flow of gas to LGC, which in turn increases machine efficiency.

Investment Done :20 Lakhs

Savings: Rs 108 Lakhs & 98832 m3 of gas / annum

2. Fuel consumption by using non metallic wearing rings in cooling water pump.

Cooling Water pump-C was suffered from heavy seal leakage & large clearances (beyond 10 mm dia), which has resulted in Gas losses. Opportunity maintenance was taken to rectify leak & modify wear ring, through in house modification.

Trial run taken & found Okay with improvement of 130 m3/ hr.

Similarly savings are proposed for other 4 pumps , hence tenders are float to have reliable & efficient savings

Investment Done : Nil, as it was in house modification

Savings achieved: 1099080 m3/annum of Natural Gas, Financial savings -1.15 Cr.

CWCP-C : CT-2 (10.00 AM) BEFORE MODIFICATION

Discharge Pressure	FLOW (M3 / HR)			AMP
	MIN	MAX	AVG	
3.4	4490	4608	4551.6	26

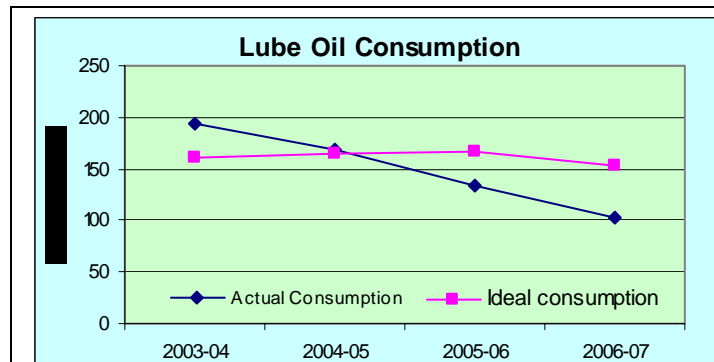
CWCP-C : CT-2 (10.35 AM) AFTER MODIFICATION

Discharge Pressure	FLOW (M3 / HR)			AMP
	MIN	MAX	AVG	
3.4	4600	4716	4680	26.1

CWCP-C : CT-2 (11.00 AM) AFTER MODIFICATION

Discharge Pressure	FLOW (M3 / HR)			AMP
	MIN	MAX	AVG	
3.4	4608	4765	4672	26.1

3. Reduction in Lube Oil consumption by Installation of Oil Mist Eliminators (OME):



Investment Done: 10 Lakh/OME, 4 OME's yet installed,

Installation of Oil Mist Eliminator (OME) in gas turbines has reduced the emission of smoke as a resultant of Lube Oil mists, formed in Lube Oil tank and there by reduced the Lube Oil Loss. Besides clean environmental effects, it has resulted in better productivity by reducing probability of tripping.

Savings: 10,500 lit of Lube Oil/annum & Rs 892500/-per annum

4. Inefficient motor replacement in Instrument Air Compressor

In LPG plant, 4 no. of IA compressors are there. Out of four, two compressors runs round the clock . Two compressors are sufficient to cater all air requirements of plant as well as of Instrumentation system. Rating of each compressor motor is 90 kW. Methodological study on efficient use of electricity concluded that 75 kW motor of same rpm can be used instead of 90 kW motor. This 75 kW motor was made available from Propane loading pump motor, as it was not in use.

Investment Done : Nil , as stored inventory was used.

Savings: 64800 kWh/yr /motor & Rs 3.2 Lakh /yr /motor financial savings.

5. Reduction in Contract demand of 132 kV supply from 5500 kVA to 3500 kVA.

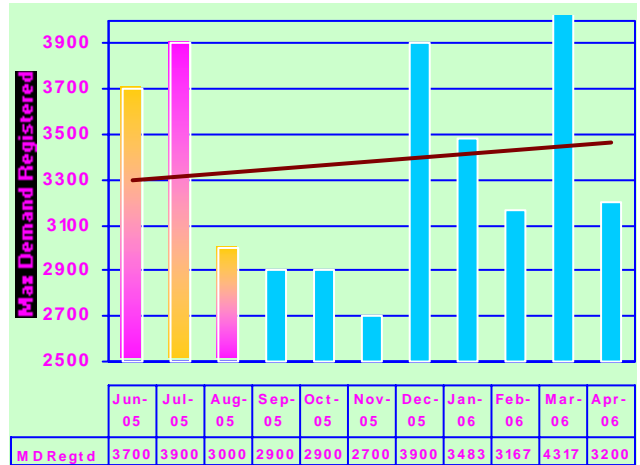
Earlier, Vijaipur Complex has Contract Demand of 5500 KVA from 132KV supply of MPSEB, which has been reduced to 3500 kVA in pursuit of excellence in energy conservation and enhancement of plant gas processing capacity. The main reasons were:

(i) Installation of two no's of Light End Fractionate (LEF) compressors driven by gas turbine of 3 MW each (i.e. total of 6 MW capacity) in year 2000, which has increased gas processing capacity of our plant by 2MMSCMD and made 4 nos of RG compressors driven by electrical motors each of 665 kW each redundant. Subsequently these motors were shifted to our other LPG plant at Gandhar, Gujarat.

(ii) Another electrical load of 275 kW was disconnected as Butane blending plant has become redundant due to change in market scenario in the country.

(iii) Auxiliary load addition of 500KW. Hence, net reduction in load is approx 2435 kW.

Investment Done : Nil ,
Savings: 79.68 Lakhs / year



6. Stoppage of 1 cooling water pump by making some modifications in cooling Tower Configurations.

Blade angle adjustment, Installation of Booster Pump for E122 and other modifications in Cooling tower configurations in Cooling water system leads to stopping of 1 CW pump of rating 275 kW along with following improvements:

- CT-1 was able to take entire Phase-1 Load and all the plant parameters were well within the desired limits.
- Reduction in Supply temperature of Cooling Water by 4 deg C.
- Increasing in ID Fan Blade angle results in increase counter flow air draft through the fill packs which is evident from the increase in load and amperes drawn by the ID Fan motors.

Investment Done : Nil
Savings: 990000kWh/yr.
49.5 Lakhs

ENERGY CONSERVATION PLANS & TARGETS

Energy Conservation Measures (Planned)	Anticipated savings in Energy/annum	Approx. investment (Rs.lakhs)	Project Commencement & Completion year
CDM Opportunity projects 1. Pipeline for feeding gas to IOCL bottling plant, GUNA to replace tankers ply. 2. Waste Heat Recovery from LEF Compressor, Lean Gas Compressor, & DVPL Compressor	Fuel Oil saving: 42064lit/annum Estimated CER /annum=136 tons of CO2 Additional Power Generation of 15 MW	300	2007-08 2007-08, 2008-09
Retrofitting of RG Heaters thru Burner Management System		36	2007-08
Replacement of 2 sets of 2 no. 50 KVA UPS	13.5 Lakh KWH	40	2007-08
VAR system for air conditioning of Control Room	14.93 Lakh KWH	70	2007-08
Solar water heater for NBH & CISF Barrack	0.24 Lakh KWH	10	2007-08

SAFETY & ENVIRONMENT

GAIL attaches great importance to Safety, Health and Environment in its plants, pipeline systems and work centres as also in the community and its work environment. The Company follows the guidelines and stipulations issued by the concerned Indian Statutory Agencies and Regulatory Bodies. For enforcing the safety of international standard, the international reputed organization are being called for safety audits e.g

- Germischer Lloyd, U.K.
- British Safety Council, U.K.

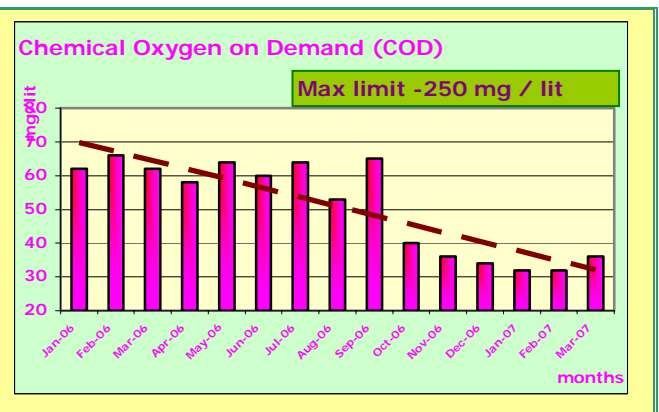
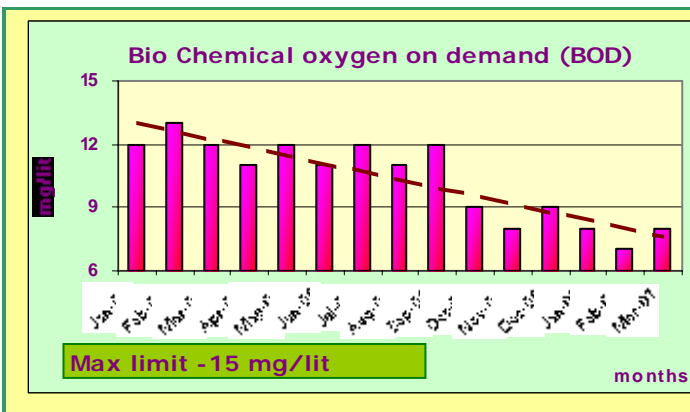
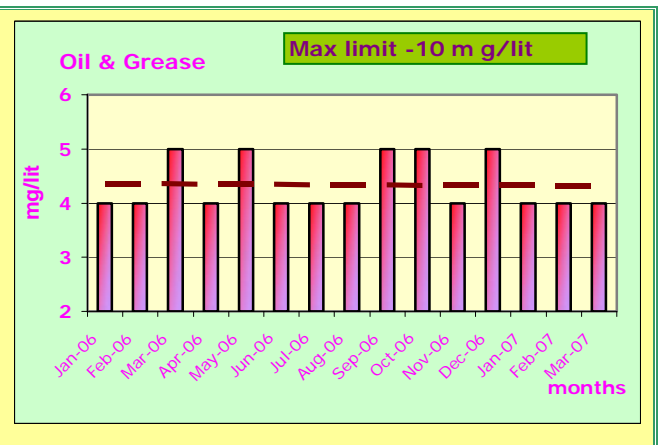
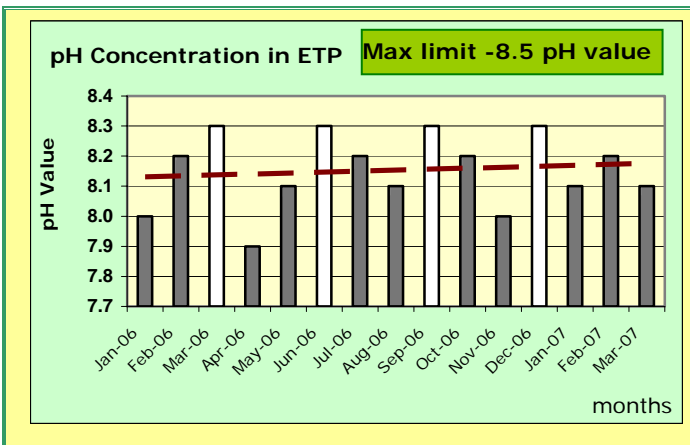
Major environmental initiatives done in last three years are:

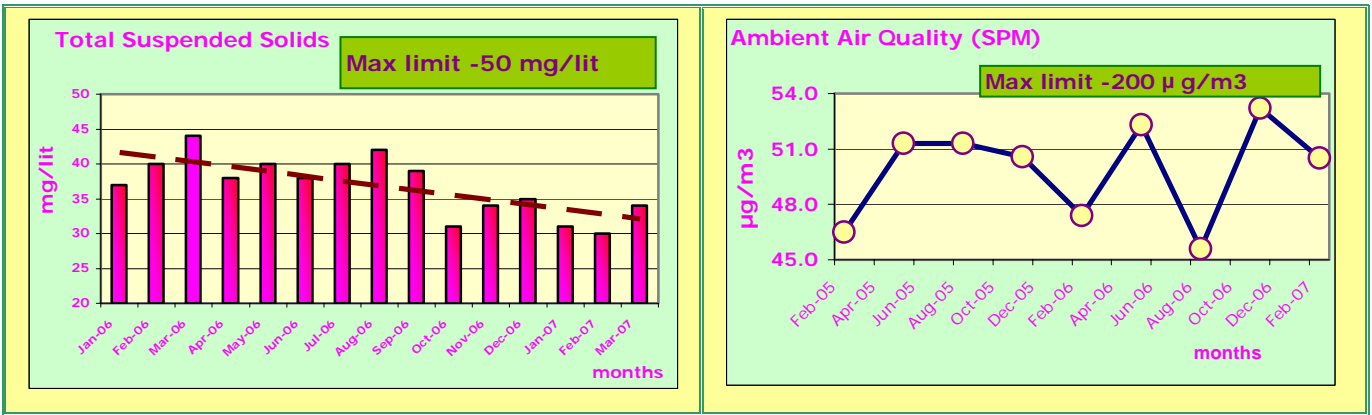
Water Effluent treatment plant: The Effluent from various section of plant is fed to the Common Effluent treatment plant, which is kept on line round the clock. The design of the effluent treatment plant provides for standby for all the running equipments, as well as for aerators. The LPG plant has integrated process waste train through which any hydrocarbon required to drain in case of emergency, is routed to effluent treatment plant and collected in PW (process waste) sump.

Urea and DAP are dosed before Aeration for microbiological growth which in turn controls the BOD and COD. The pH of water remains same and there is no requirement of acid or alkali dosing in the system.

The rate of effluent generation and the intensity of pollutants is well below the design limits of MPPCB.

Main water pollutants from LPG plant	The indicators to monitor
<ul style="list-style-type: none"> • Oil and grease • Total suspended solids (TSS) 	<ul style="list-style-type: none"> • Biochemical oxygen Demand • Chemical oxygen demand • pH value





Air: Since natural gas is used as fuel in Gas turbines and RG Heaters, the flue gases have insignificant quantity of pollutants. State of the art technological designs of gas turbines and rigorous predictive and preventive maintenance schedules ensure that the complete combustion takes place inside combustion zone, and pollutants emitted in flue gases are well below the standard pollution norms. Hence no treatment for the pollutants is required. The tables given below indicate the average values of pollutants emitted from our plant.

The pollutants, which are emitted from our Plant, are listed below

- Suspended particulate matter (SPM)
- Sulphur dioxide (SOX)
- Oxides of nitrogen (NOX)
- Noise

AMBIENT AIR QUALITY RESULTS (Average values for 2006-07)

(Frequency: Quarterly)		
PARAMETERS	PCB Limit	RESULTS
SO _x	120 ug/m ³	4.2 u/m ³
NO _x	120 ug/m ³	5.4 ug/m ³
SPM	500 ug/m ³	50 ug/m ³
CO	5000 ug/m ³	< 600 ug/m ³
HC	-	< 1 ppm

STACK EMISSION RESULTS (Average values for 2006-07)

(Frequency: Quarterly)		
PARAMETERS	PCB Limit	RESULTS
SO _x	80 mg/m ³	2.4 mg/m ³
NO _x	120 mg/m ³	3.3 mg/m ³
SPM	150 mg/m ³	6.9 mg/m ³
CO	2000 ppm	49 ppm

Solid Waste – No Solid Waste, except Oil & Grease through treatment of ETP water.

Environment & Safety is given prime importance by compliance & adherence to various acts , such as Air act, Water act, Storage / handling / disposal of hazardous chemicals / waste (including bio-medical waste) & Compliance with the prescribed approvals / standards for - Effluents, Emissions, Hazardous / biomedical/ solid waste. & EXPLOSIVE (CCOE) LICENSES.

Our efforts in the area of safety & environment have been recognized by the various national & international organizations, also we have never penalized for any non compliance.

The awards received in this area are listed below:-

- Five Star Ranking' from British Safety Council for 2001, 2002, 2003 & 2005.
- Sword of Honour from British Safety Council for 2001, 2002, 2003 & 2005.
- National Safety Council Award for 1997, 1999, 2001, 2002 & 2003.
- Greentech Foundation Gold Safety Award for 2002, 2005 & 2006,
- Greentech Environmental Excellence Award 2002, 2004, 2005, 2006 & 2007.
- Rajiv Gandhi National Award for Excellence in Environment and Ecological implementation for 2001.
- Prashansa Patra Puraskar by NSC, Mumbai 2001-02.
- National Gas Conservation Award – LPG 2004 & 2005
- Golden Peacock Environment Management Award – 2005
- Sarvashrestha Suraksha Puraskar by National Safety Council – 2005.
- OISD Safety Award for Cross Country pipeline to HVJ Compressor station -93-94, 96-97, 97-98, 98-99, 99-2K, 2K-01, 01-02, 04-05, 05-06, 06-07.
- OISD Safety Award to LPG Plant Vijaipur among other processing organizations- 92-93, 1998-99, 2006-2007