ENVIRONMENTAL REPORT 2004

Pakistan Refinery Limited

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Scope of the Report

The scope of this report is to provide information about the environmental impacts and operational performance of Pakistan Refinery Limited to all stakeholders for assessing their relationship with PRL in year 2004; however, some of our activities of the previous years are also included.

Executive Summary

Pakistan Refinery Limited is certified against the requirement of ISO-14001:1996 and OHSAS-18001:1999 since November 2002. The objectives and targets are finalized through business strategy workshops, taking into consideration HSE risk assessment, management reviews and keeping in view the comments of the stakeholders.

Under sustainable development program, the long term objectives such as saving of natural resources by energy conservation, oil losses reduction, zero effluent and global compact are also taken into consideration.

The refinery is meeting all the legal requirements of Corporate Governance, Health, Safety & Environment and actually going beyond that.

The results of bench marking study carried out by Shell Global Solution where a number of refineries were included shows a good performance by PRL.

The issues such as the disposal of oily sludges, solid hazardous waste and oil spills are also raised.

The organization spends a good amount of money on sustainable development and other environmental related issues.

Message from General Manager & Chief Executive

We at Pakistan Refinery Limited are committed to a business strategy that generates value while contributing to the well-being of the planet generally and the community living around specifically. Risks are associated with achieving long term plans or running operational activities, so we need to know, understand and manage the relationship between business environment, our objectives, risk and performance.

One of our priorities is the commitment to the protection of environment and to ensure health and safety of our employees, customers, contractors and communities where we operate. I am pleased to report that we have achieved the highest number of man-hours i.e. 7.4 million without Lost Time Injury. But we need to further strengthen our HSE Management System with a goal of eliminating all health, safety and environmental incidents on sustainable basis.

Z. Haleem
GM & CEO

We are also committed for continual improvement of HSE by protecting air, land, water, equipments and employees. During the recent years, we invested more than 350 million rupees on energy saving projects, effluent treatment plant and implementing HSE Management System beyond the requirements of international standard based on ISO 14001:1996 and OHSAS 18001:1999. We are certified against these standards and no major or minor non-conformity was reported during the last two surveillance audits.

We are aware of our responsibilities to the communities living around us and keep them informed about important HSE issues. We are also spending on the education of the poor children, donations to the hospitals in the vicinity and construction of roads where required.

Needless to say that we need to continuously strive hard to further improve our standards.

Sincerely,

Z. Haleem
General Manager & Chief Executive Officer

Corporate Governance

VISION

To be the Refinery of first choice for all stakeholders.

MISSION

PRL is committed to remaining a leader in the oil refining business of Pakistan by providing value added products that are environmentally friendly, and by protecting the interest of all stakeholders in a competitive market through sustainable development and quality human resources.

PRL believes and practices the following Corporate Governance fundamental principles:-

- Vision / Mission statement and overall corporate strategy.
- Approve and sign statements of Ethics and Business practices and ensure its communication to all employees.
- Formulation/approval of significant policies.
- Define materiality levels.
- Approve major decisions and exercise powers specified (law and code).
- Establish sound internal control systems and issue statement on internal control.
- Define the role and responsibilities of the Chairman of the Board and Chief Executive Officer.
- Issue statements in the annual report on:
  - True and fair view of the Financial statement.
  - Books of account.
  - Accounting policies and IASs.
  - Policy on Health, Safety and Environment.
  - Going concern etc.
- Statement of compliance with the code of corporate governance in Annual Report.
- Ensure review of compliance statement from statutory auditors.

Company Profile

Pakistan Refinery Limited (PRL) was built and commissioned in October 1962 at Karachi in alliance with major foreign oil companies like Burmah Oil California, Texas Oil Corporation, Shell Petroleum Corporation and Esso Standard Eastern Inc.

PRL is a hydro-skimming refinery with a capacity of 50,000 barrels per operating day. The process configuration constitutes of desalting, crude distillation, hydrodesulphurization, platforming and LPG units. Though, designed to process Iranian Light, it has acquired the ability to process a variety of imported and indigenous crude oils to produce energy products namely-LPG, MS Unleaded 90 RON, Naphtha, Kerosene, HSD, JP-1, JP-4, MTT and Furnace Oil.

PRL, since inception has been the principle manufacturer and supplier of petroleum products to the domestic market and Pakistan defense forces. It continues to serve the energy needs of the country with professional excellence and high degree of commitment. PRL takes pride in the competitive edge over other competitors in respect of efficiency, lower operating cost, high quality human resources, reliability and introduction of newer generation technologies.

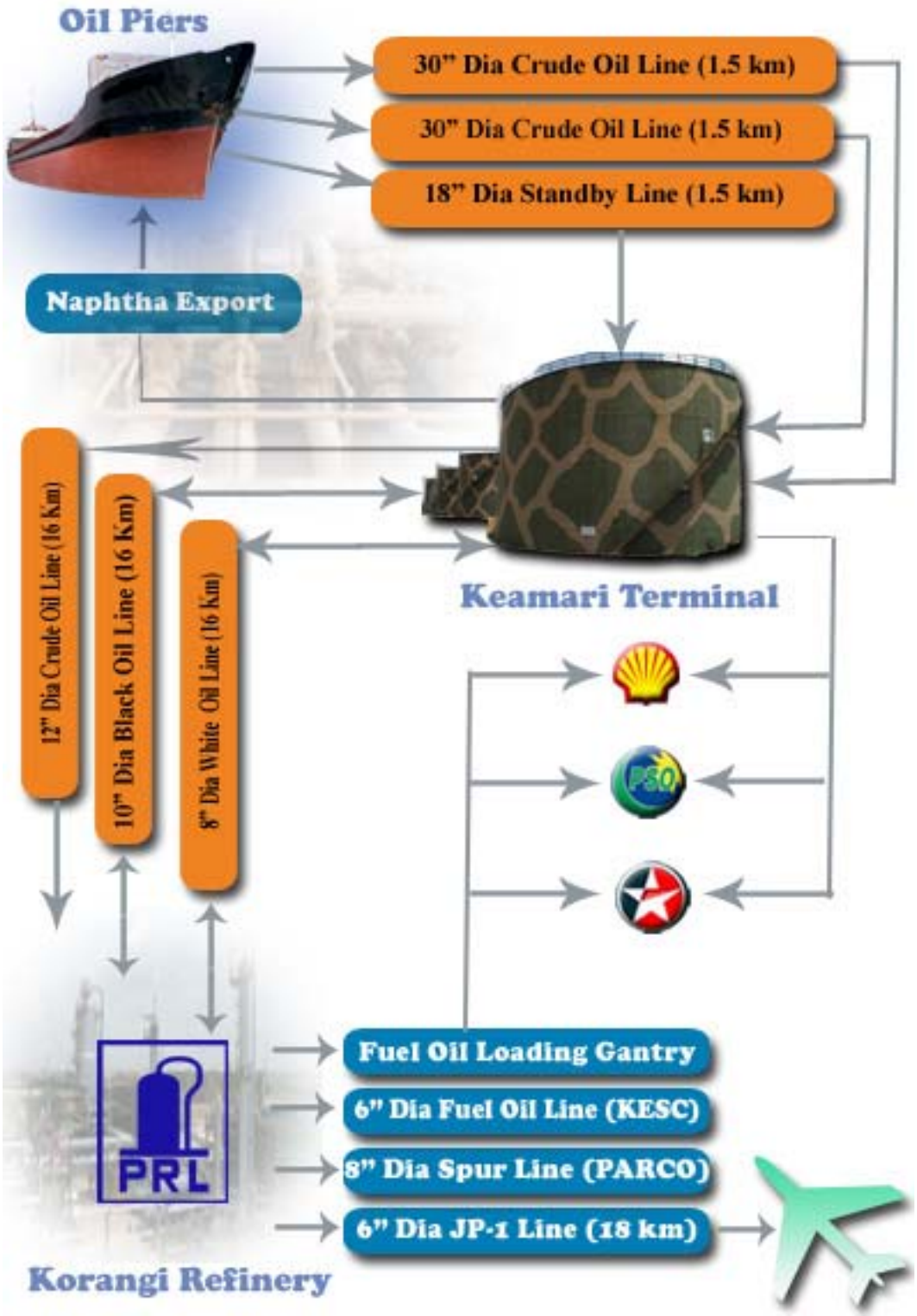
PRL has demonstrated its excellence as a first rate corporate citizen by serving community and demonstrating total commitment to the cause of Health, Safety and Environment. PRL is proud to be the leader in integrated HSE Management System, being the first in Pakistan oil industry to achieve OHSAS 18001:1999 and ISO 14001:1996 certification in November, 2002

No. of sites = 2 (Refinery and Oil Storage Terminal at Keamari)

No. of Employees = 290

Annual Turnover = Rs.28.7 billion (July 03- June 04)

Overall Operation Network



Process Units

Process Summary

Refinery produces three fractions from the primary fractionating column:

1. Residue from the bottom, which is used as Fuel Oil.
2. Gas oil from the side, used as High Speed Diesel (HSD) engine fuel.
3. Combined kerosene, naphtha, and gasoline and gas fraction from the top, which is used as feedstock for the Catalytic Hydrodesulphuriser Unit.

Desulphurized product is further fractioned to produce:

1. Kerosene from the bottom, which is suitable for use as Aviation Turbine fuel and also for cooking and illumination.
2. Unstabilized gasoline from the top.
3. Naphtha from the side, which is used as feedstock for the Platformer Unit.

The unstabilized gasoline is further stabilized to produce:

1. Gasoline from the bottom, which is suitable for use in Motor Spirit production.
2. LPG and Fuel Gas from the top, which are then separated.

Units Installed

- Desalter Unit
- Crude Unit
- Catalytic Hydrodesulphuriser Unit
- Platformer Unit
- Effluent Water Treatment Plant
- LPG Sweetening Unit
- Reverse Osmosis Unit
- Water Softening Unit
- Steam Generation Unit
- Electricity Generation Unit

Desalter Unit

Crude oil often contains water, inorganic salts, suspended solids and water-soluble trace metals. As a first step in the refining process, to reduce corrosion, plugging, fouling of equipment and to prevent poisoning of catalyst in processing units, these contaminants are removed by desalting. In desalting process, brine particles are coalesced with added wash water droplet and consequently separated by gravity.

Crude Unit

The objective of the oil refining process is to separate the crude oil into number of fractions, each of which then contains a narrower range of hydrocarbons, which are more suitable for conversion into saleable products. The following table shows Pakistan Refinery Limited's typical crude recipe and production slate.

Crude Recipe (%age)		Products (%age)	
Arabian Light	50	LPG	1.0
Iranian Light	30	Naphtha Export	7.0
Local Crude	20	MS unleaded 90 RON	7.0
		Kerosene	1.3
		HSD	31.5
		JP-1	7.0
		JP-4	3.0
		MTT	0.3
		Furnace Oil	41.9

Hydro Unit

A wide range of the product stream is obtained from the crude unit. In most cases, the properties of these streams either as final products or as feed stock for further processing are adversely affected by components like sulphur and nitrogen. PRL employs one of the most modern methods of removal of Sulphur compounds known as Catalytic Hydrodesulphurization.

Platformer Unit

Naphtha is not suitable for use as motor gasoline because of its low octane number. It may however, be reformed into a more useful product. Catalytic reforming is an important process to convert low-octane naphtha into high octane gasoline blending component called platformate. The platformate so produced has a much higher octane number than either the naphtha feed or the hydrogenated gasoline fraction.

Effluent Water Treatment Unit

Waste water treatment plant is used for the treatment of process run-off and sewage water prior to discharge from Refinery premises. Some of the sources of the waste water are condensed steam, stripping water, spent caustic solution, cooling tower, RO plant and boiler blow down. Waste water typically contains oil and grease, dissolved materials, suspended solids, phenols, ammonia, sulphides, COD, BOD and other undesirable compounds. Methods of treatment are:

- Physical treatment
- Chemical treatment
- Biological treatment

LPG Sweetening Unit

The purpose of this unit is to extract the heavier C3/C4 components from the fuel gas through absorption in kerosene.

Reverse Osmosis Unit

Reverse osmosis is preferred technique for the production of potable water from brackish water or sea water. An optimal system comprising of pretreatment and reverse osmosis unit eventually produces the water, which meets industrial use requirements. The reverse osmosis plant consists of following unit operations:

1. filtration
2. disinfection
3. chemical treatment
4. reverse osmosis

Water Softening Unit

Raw water supplied by KDA contains many impurities. If this water is used in boilers for the generation of steam, salts can produce a hard scale in the inner surface of the boiler tubes. These hard scales reduce the heat transfer resulting in more fuel consumption to generate steam. Moreover, the boiler tubes might rupture due to overheating. The removal of these hardness producing salts is the aim of this unit.

Steam Generation Unit

The major source of motive power in the refinery is steam. Steam is generated with the help of boilers. There are three "water in tube" boilers capable of producing 45,000 lbs/hr of super heated steam at 20 kg/cm2 pressure each. The boiler assembly consists of steam drum on the top and the water/ mud drum at the bottom. These drums are connected together by tubes, some of which are extended to form the fire box envelope.

Electricity Generation Unit

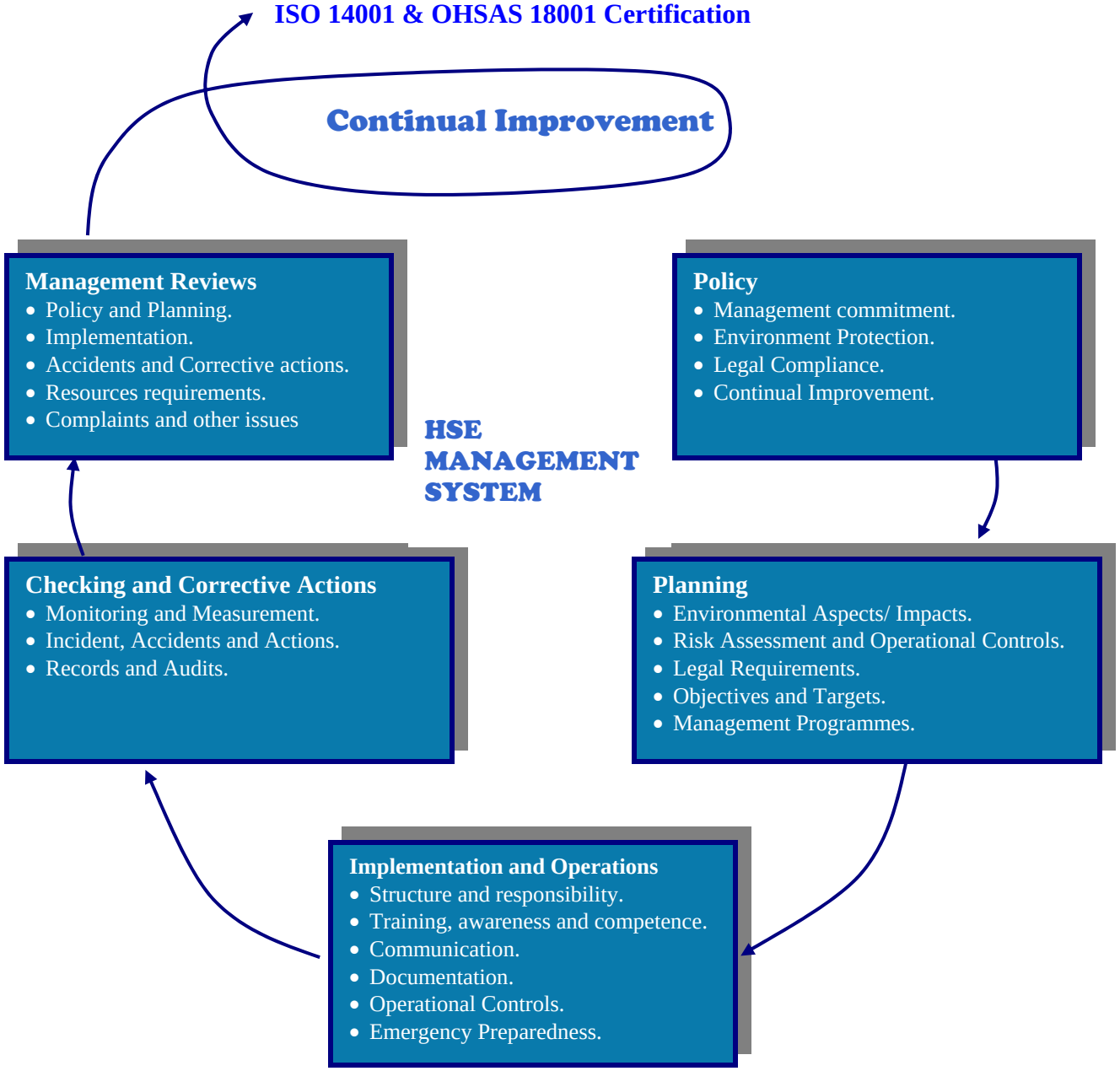
Apart from steam which is employed as the major source of motive power, there are other equipments in the refinery that operate on electricity. PRL's source of electricity is KESC. However, in case of a power failure, PRL employs three electricity generation units to provide backup electricity. This backup energy is generated through diesel generators.

Health, Safety & Environment Management System

At PRL HSE Management System is an integration of ISO 14001:1996 and OHSAS 18001:1999.The scope of PRL's Health, Safety and Environment Management System covers refining, storage and distribution of crude oil and petroleum products at Korangi Refinery and Keamari Terminal.

PROUD TO BE THE LEADER
IN INTEGRATED HSE MANAGEMENT SYSTEM

First in Pakistan Oil Industry to achieve
ISO 14001 & OHSAS 18001 Certification



PAKISTAN REFINERY LIMITED

POLICY ON HEALTH, SAFETY & ENVIRONMENT

PRL is committed to the protection of environment and to ensure health and safety of its employees, customers, contractors and communities where it operates and to work for continual improvement of health, safety and environment.

PRL is also committed to comply with the applicable HSE laws and regulations and work with the government and others in their development and implementation.

This policy shall be used to demonstrate this commitment through:

HEALTH

- ***PRL*** seeks to conduct its activities in such a way as to avoid harm to the health of it's employees and others, and to promote the health of it's employees as appropriate.

SAFETY

- ***PRL*** works on the principle that all hazards can be prevented by actively promoting a high standard of safety consciousness and discipline that the principle demands.
- ***PRL*** seeks to dedicate itself to provide a safe working environment through effective leadership, supporting safety, fire prevention and protecting the physical assets of the company.

ENVIRONMENT

- ***PRL*** is committed to prevent pollution through progressive reduction of emissions, effluents and disposal of waste materials that are known to have a negative impact on the environment with an ultimate aim of eliminating them, and to ensure an effective and efficient use of natural resources and other inputs.

PRL conducts periodic audits and risk assessment of its activities, processes and products for setting and reviewing its objectives and targets to provide assurance to improve HSE standards and loss control. ***PRL*** requires it's contractors working on its behalf to apply health, safety and environment standards fully compatible with its own.

Z. HALEEM
GENERAL MANAGER
AUGUST 01, 2003

HSEF-01/Rev 02

HSE Requirement for Suppliers and Contractors

PRL has a defined mechanism for identifying requirements for products and services purchased from suppliers / contractors that have a significant HSE risk. The requirements related to HSE risks of products and services are considered at the time of purchase or awarding of contract. The concerned requisitioner ensures identification of specific hazards associated with the purchase of goods and critical product services such as maintenance, construction, waste disposal, hazardous chemicals, bulk chemical handling, etc.

The requirements include but not limited to:

- Handling/ packaging/ identification requirements.
- Requirements of transporting carrier.
- Information about the product composition/ Material Safety Data Sheet (MSDS).
- Compliance of HSE procedure for performing the activity.
- Usage of protective gears.
- Competence/ training requirements.
- Handling / disposal of waste, etc.

The requirements related to HSE are also stipulated in "HSE Regulations for Contractors".

Issues with the Suppliers and Contractors

- Non-availability of standard and well maintained equipments like cranes, slings, shackles, etc.
- Incomplete information of products and services such as MSDS, etc.
- Non-availability of technical labor.
- Lack of awareness on HSE matters.

Life Cycle Assessment

Aspect	Impact	Scale	Life Cycle Impact Data	Common Effect	Actions
Flue gases from furnace operation, gas leakages from tanks and Air Conditioner system	Global warming	Global	• Carbon Dioxide(CO_2) • Nitrogen Dioxide (NO_2) • Methane(CH_4) • Chlorofluoro Carbon (CFCs)	Global Warming Potential Note: Global Warming potential can be 50,100 or 500 year potentials.	• All furnace burners changed with low excess air burners • Fuel recipe adjusted • No action on CFCs
• Leakage from Air Conditioner • Usage of chemicals for platformer catalyst activity	Stratospheric ozone depletion	Global	• Chlorofluoro Carbon (CFCs) • Ethylene dichloride (EDC)	Ozone Depleting potential	• No action on CFCs • EDC replaced with per chloroethylene (PERC) which is environment friendly
• Flue gas from Furnaces • Leakages from system	Acidification	Regional /Local	• Sulphur Dioxide (SOx) • Nitrogen Oxides (NOx) • Hydrochloric Acid (HCL) • Ammonia (NH4)	Acidification potential	• Low Sulphur fuel used • Low excess air burner installed • NH_4 replaced with Amines
• Flue gases • Crude overhead corrosion control	Eutrophication	Local	• Nitrogen Oxide (NO) • Nitrogen Dioxide (NO_2) • Nitrate (NO_3) • Ammonia (NH4)	Eutrophication potential	• Low Sulphur fuel used • Low excess air burner installed • NH4 replaced with Amines
Leakages from Tanks and Fugitive emission	Photochemical smog	Local	Non-Methane Hydrocarbon (NMHC)	Photochemical oxidant creation potential	All the fixed roof crude and product tanks changed with floating roof and screens to minimize vapor escape
• Effluent discharged from process • Accidental release of chemicals	Aquatic toxicity	Local	Toxic chemicals with a reported lethal concentration to fish	Sea water contamination	• Effluent treatment plant in operation • Emergency response plan in place
Soil and ground contaminants	Human health	Global/ Regional /Local	Total releases to water and soil	Underground water contamination	• Regular monitoring • Containments provided
Use of crude and natural resources	Resource depletion	Global/ Regional /Local	Quantity of minerals/fossil fuels	Resource depletion potential	Energy conservation and loss control objective
Hazardous waste (Catalyst, Sludges, low density asbestos, used Hg tube-lights, etc)	Land use	Global/ Regional /Local	Quantity disposed off in a landfill	Solid waste	Methods being explored to get rid of hazardous waste in Environmental friendly manner

Effluents

Pollution due to effluents from crude, hydro, platformer, utilities and crude tanks draining being discharged to sea. The quantity being discharged is about 500 tons/day. The effluent contains the major pollutants such as oil and grease, phenols, sulphides, chemical oxygen demand (COD), biological oxygen demand (BOD). These pollutants are harmful for aquatic life.

Emissions

The emission includes hot gases from process furnaces and boiler stacks. It also includes the hydrocarbon emissions from crude/product tanks, fugitive emissions from valve glands/seals, drains and generators, leakages of R-22 from refrigeration system and vehicle exhaust emissions.

The gases produced are SO_x, NO_x, CO_2, CO and particulate matters. These have harmful effects on human life as they degrade the air quality and causes depletion of Ozone layer.

Depletion of Natural Resources

- Loss of hydrocarbons from crude / product tanks
- Use of electricity/energy consumption
- Water consumption

Soil and Under Ground Water Contamination

Accidental releases of oil/other chemicals and no proper method available for proper disposal of crude/product sludges.

Hazardous Waste Disposal

- Clinical Waste
- Mercury/mercury containing tube lights
- Used lead batteries
- Asbestos gasket/low density asbestos
- Iron sulfide
- Cartridges (printer, oily)

Non Hazardous Waste

- Scrap (wooden, aluminum, iron, etc.)
- Cartridges (water)
- Garbage
- Glass
- Paper

The following are also taken into consideration:-

Noise

From burners, generators, pumps and compressors.

Heat

Generation of heat from hot equipments and in the form of flue gases from furnace stacks. These contribute towards global warming.

Odor

Fugitive emission from drains, tanks and glands.

Vibration

Vibration from pumps and compressors due to inadequate maintenance.

Visual and Aesthetics

Change in the environment/vicinity due to activity and accidents such as oil spill, leakages, etc.

Radioactive material

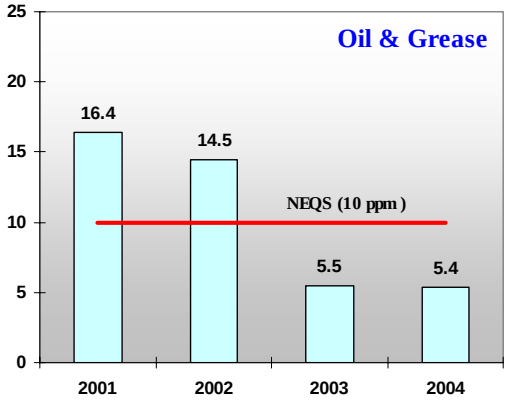
Radiography is done for newly welded joints.

Quantitative Environmental Impact Assessment

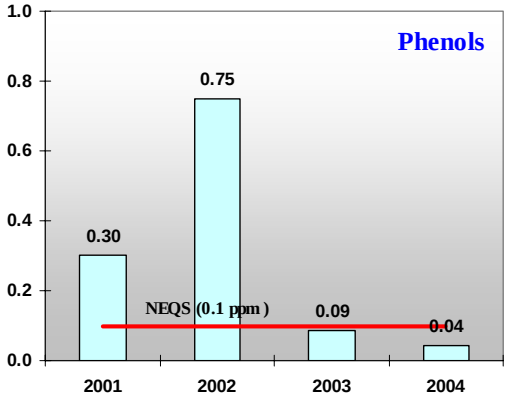
PRL measures and monitors on regular basis all the key characteristics of operations and activities that can have any significant impact on the Health, Safety and Environment. Below are the statistical representations of environmental impacts:-

Effluent Discharged to Sea

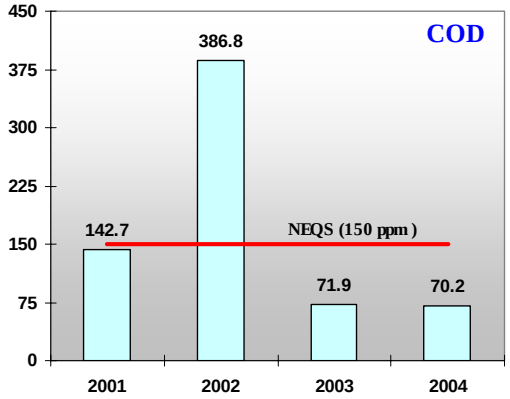
Oil & Grease
Effluent Discharged to Aquatic Environment (in ppm)



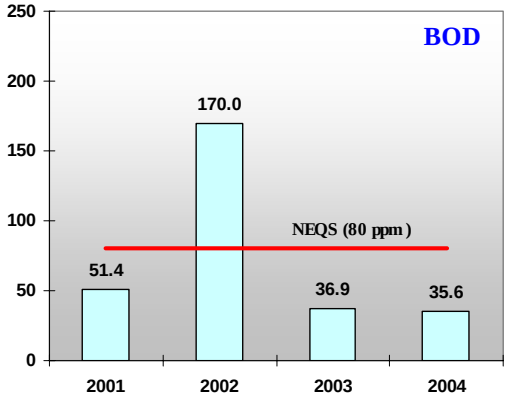
Phenols
Effluent Discharge to Aquatic Environment (in ppm)



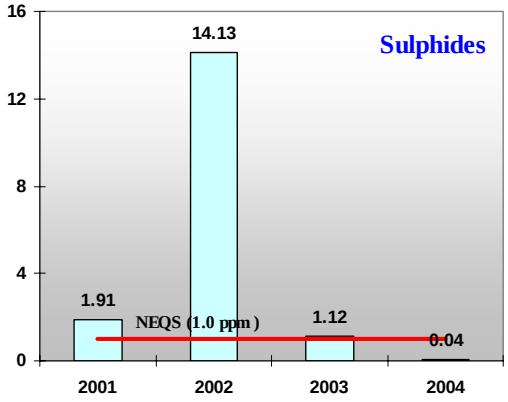
Chemical Oxygen Demand
of Effluent Discharge to Aquatic Environment (in ppm)



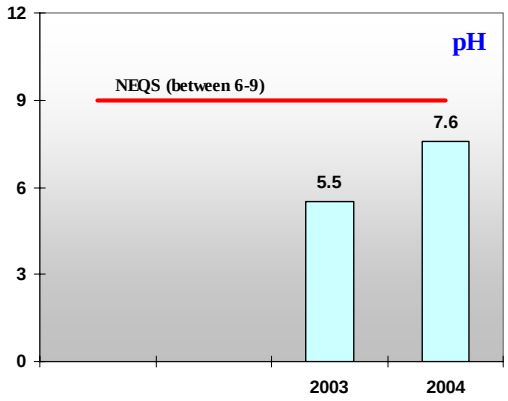
Biological Oxygen Demand
Effluent Discharge to Aquatic Environment (in ppm)



Sulphides
Effluent Discharge to Aquatic Environment (in ppm)



pH
Effluent Discharge to Aquatic Environment

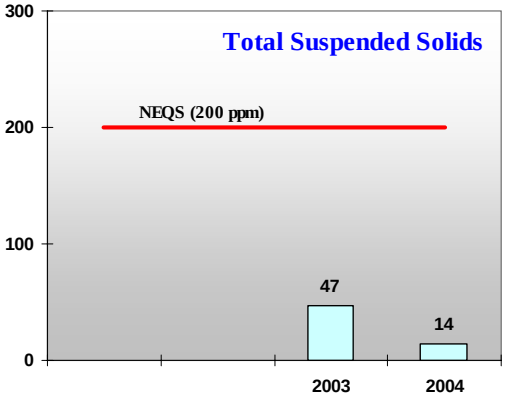


NEQS = National Environmental Quality Standard

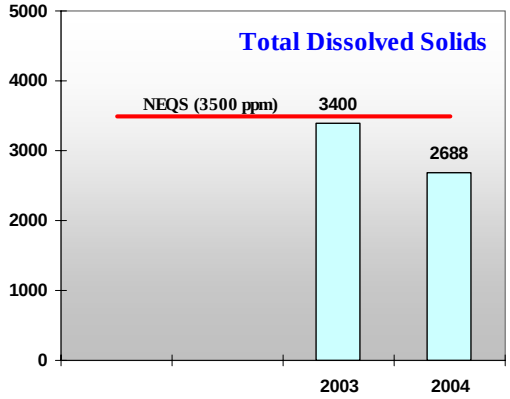
Quantitative Environmental Impact Assessment

Effluent Discharged to Sea

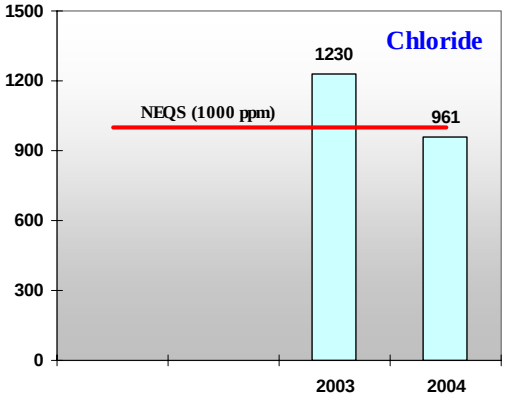
Total Suspended Solids
Effluent Discharge to Aquatic Environment (in ppm)



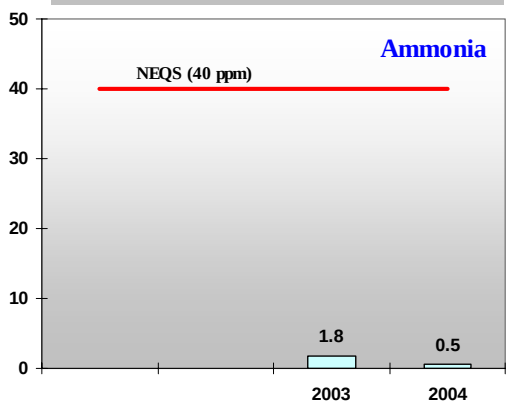
Total Dissloved Solids
Effluent Discharge to Aquatic Environment (in ppm)



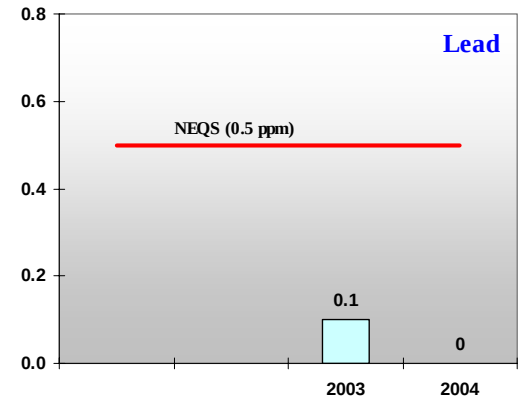
Chloride
Effluent Discharge to Aquatic Environment (in ppm)



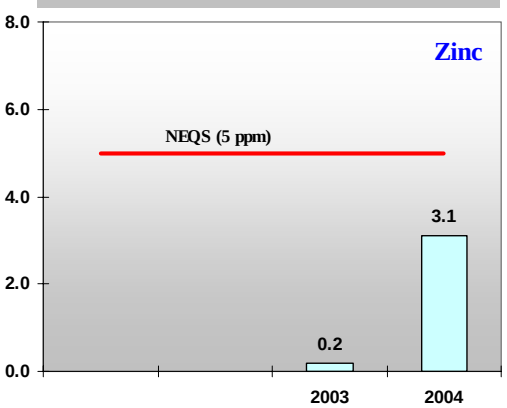
Ammonia
Effluent Discharge to Aquatic Environment (in ppm)



Lead
Effluent Discharge to Aquatic Environment (in ppm)



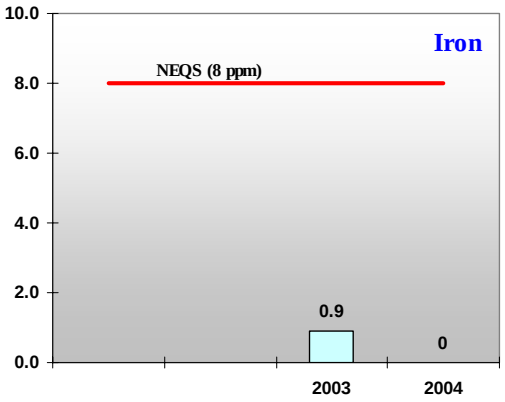
Zinc
Effluent Discharge to Aquatic Environment (in ppm)



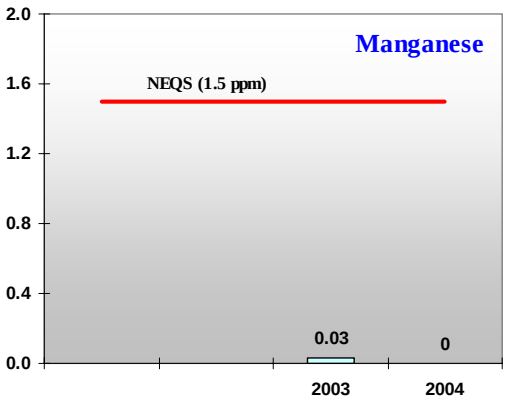
NEQS = National Environmental Quality Standard

Effluent Discharged to Sea

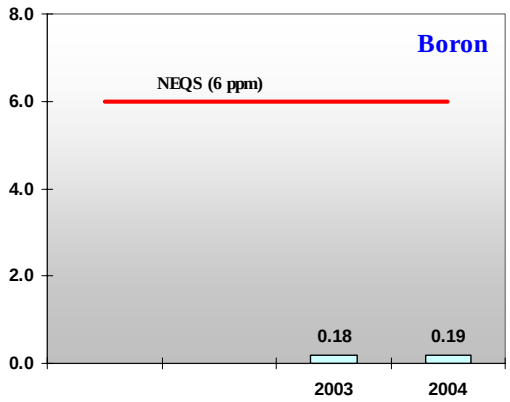
Iron
Effluent Discharge to Aquatic Environment (in ppm)



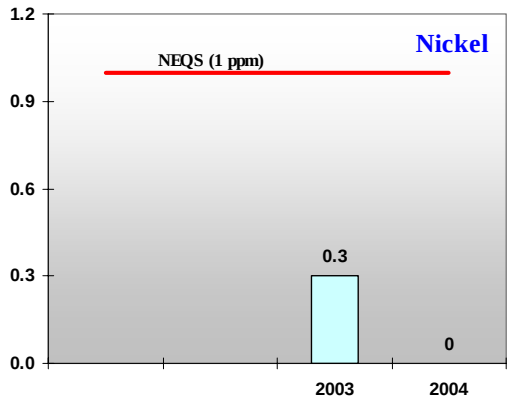
Manganese
Effluent Discharge to Aquatic Environment (in ppm)



Boron
Effluent Discharge to Aquatic Environment (in ppm)



Nickel
Effluent Discharge to Aquatic Environment (in ppm)



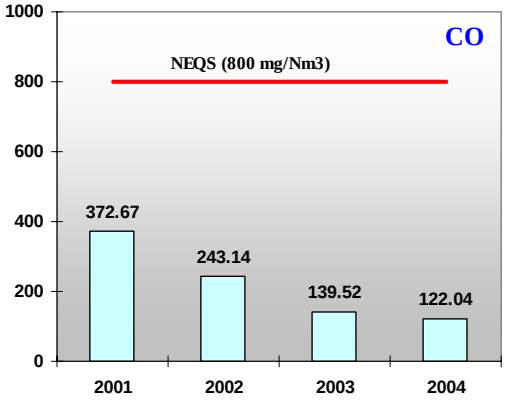
NEQS = National Environmental Quality Standard

The remaining effluent parameters of NEQS like – fluoride, cyanide, cadmium, chromium, copper, selenium, silver, arsenic, barium, chlorine, mercury, cadmium are also tested annually and there results are always NIL.

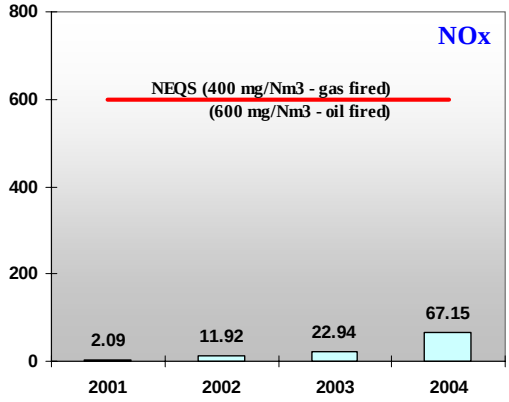
Quantitative Environmental Impact Assessment

Emissions

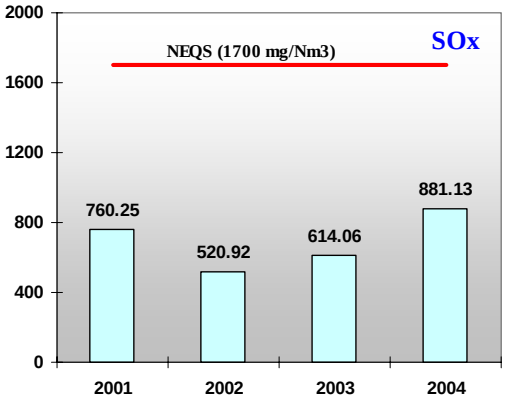
CO
Emmited into the atmosphere (in mg/Nm3)



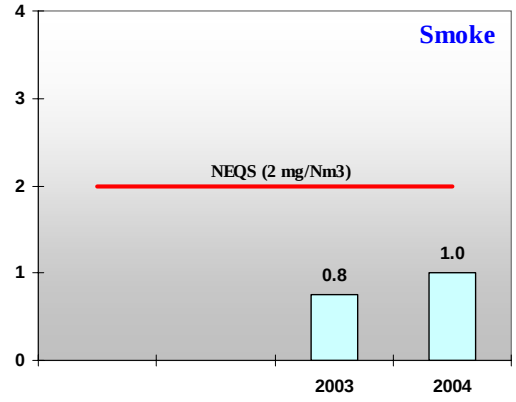
NOx
Emmited into the atmosphere (in mg/Nm3)



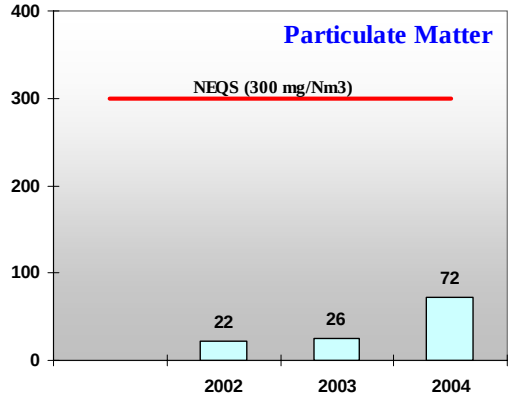
SOx
Emmited into the atmosphere (in mg/Nm3)



Smoke
Emmited into the atmosphere (in Ringlemann)



Particulate matter
Emmited into the atmosphere (in mg/Nm3)



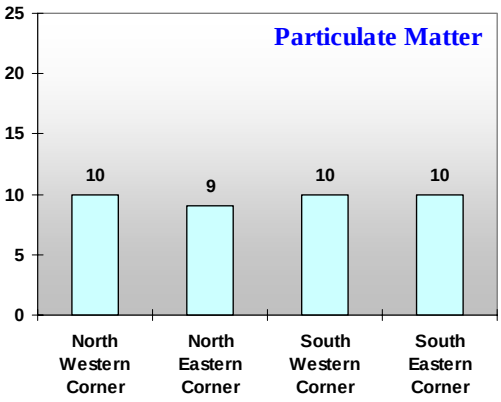
The remaining emission parameters of NEQS like – hydrogen chloride, chlorine, hydrogen fluoride, hydrogen sulphides, mercury, cadmium, arsenic, copper, antimony, zinc, lead are also tested annually and there results are always NIL.

NEQS = National Environmental Quality Standard

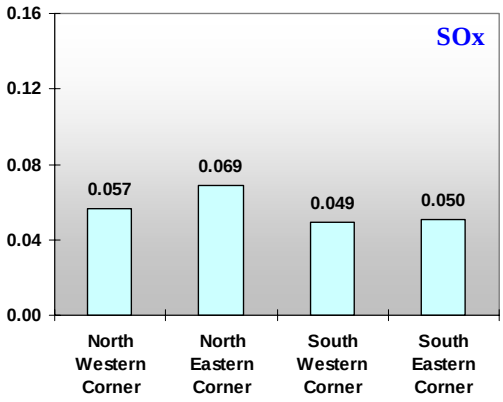
Ambient Air

Ambient air testing is performed annually. The objective is to monitor the impact of refinery emissions on the environment. The samples are taken from four locations representing the periphery of the refinery. Criteria pollutants such as particulate matter, SOx, CO, NOx and others are measured.

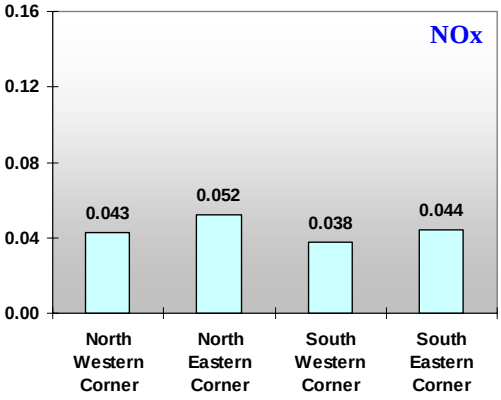
Particulate Matter
In ambient atmosphere (in mg/Nm3)



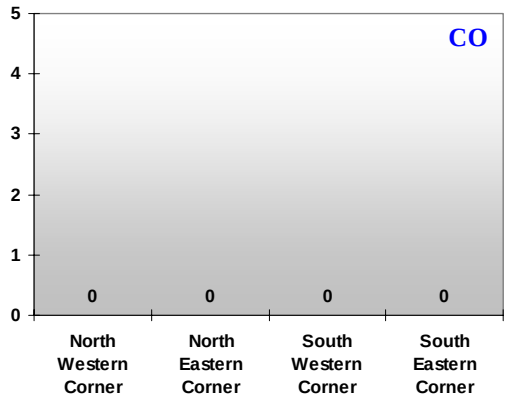
Oxides of Sulphur
In ambient atmosphere (in mg/Nm3)



Oxides of Nitrogen
In ambient atmosphere (in mg/Nm3)



Carbon Monoxide
In ambient atmosphere (in mg/Nm3)

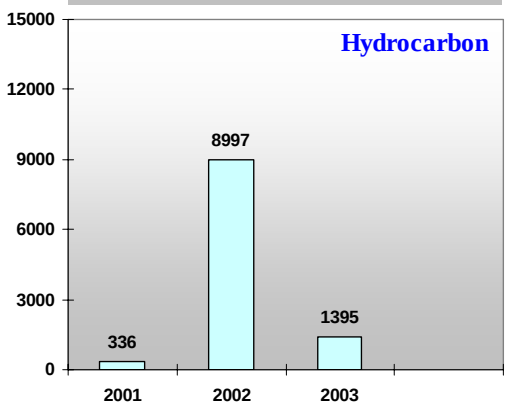


Quantitative Environmental Impact Assessment

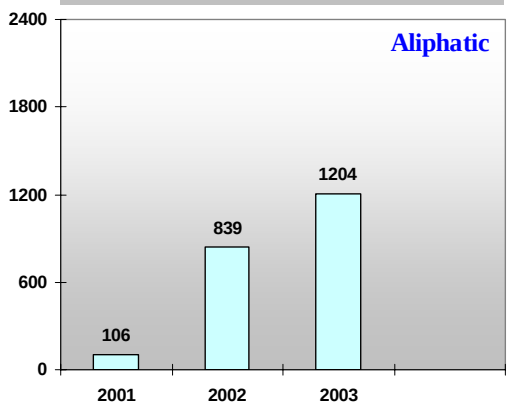
A programme for soil and underground water monitoring was initiated in 2001 with the aim to determine the current level of soil and ground water contamination within refinery premises and thereafter continuous monitoring on annual basis. The testing for 2004 is due in the month of december.

Soil

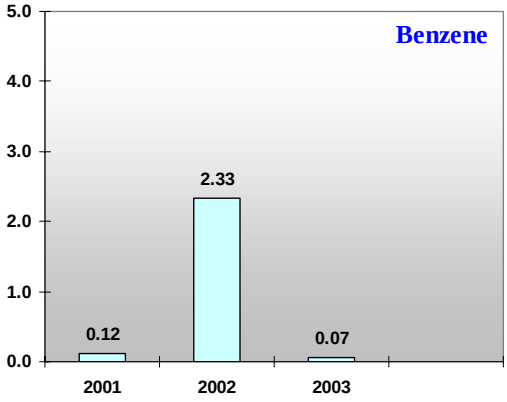
Hydrocarbon
In soil (in mg/ kg)



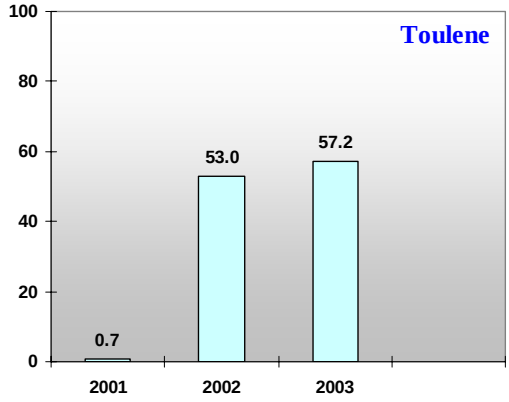
Aliphatic
In soil (in mg/ kg)



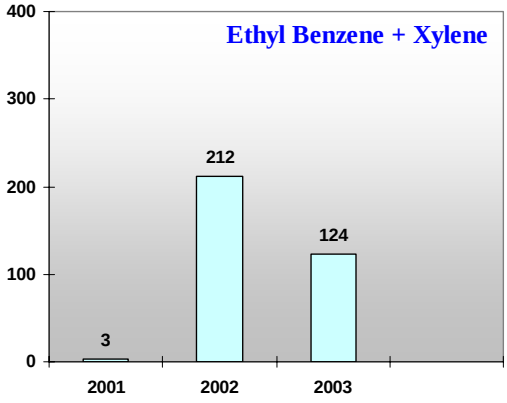
Benzene
In soil (in mg/ kg)



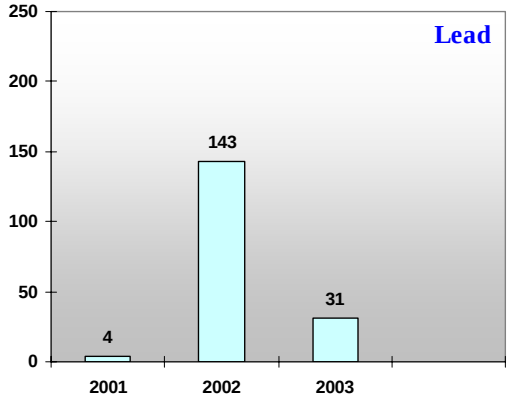
Toulene
In soil (in mg/ kg)



Ethyl Benzene + Xylene
In soil (in mg/ kg)

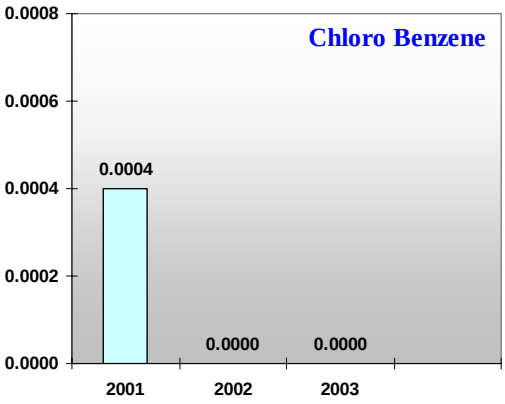


Lead
In soil (in mg/ kg)

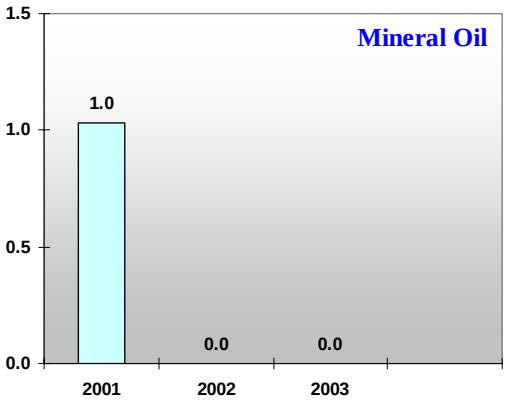


Underground Water

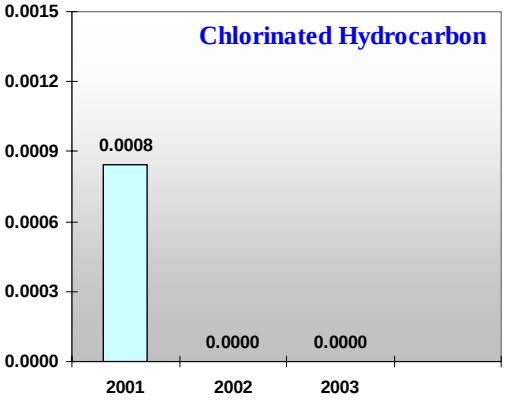
Chloro Benzene
In underground water (in ppm)



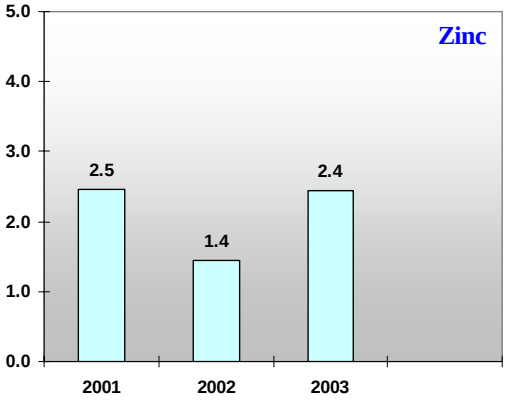
Mineral Oil
In underground water (in ppm)



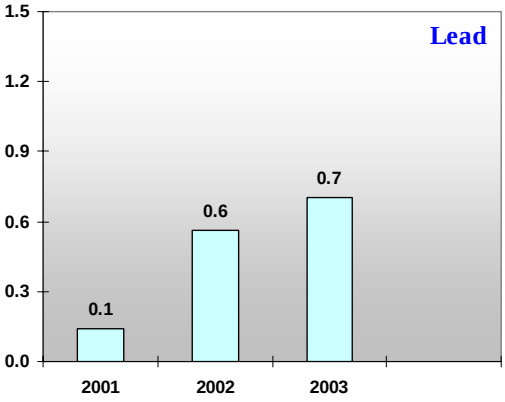
Chlorinated Hydrocarbon
In underground water (in ppm)



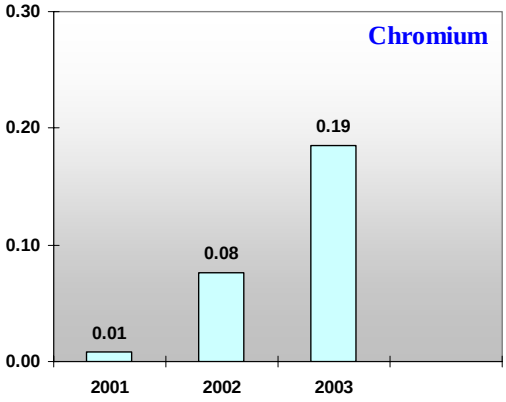
Zinc
In underground water (in ppm)



Lead
In underground water (in ppm)

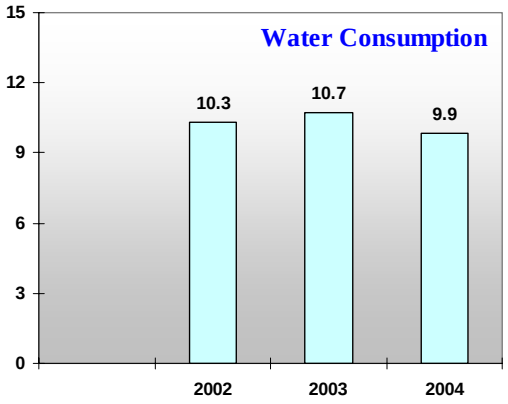


Chromium
In underground water (in ppm)

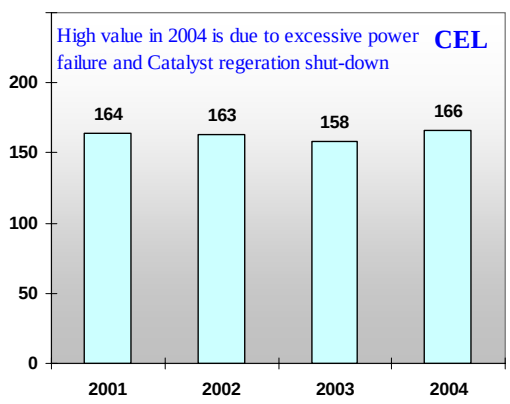


Miscellaneous

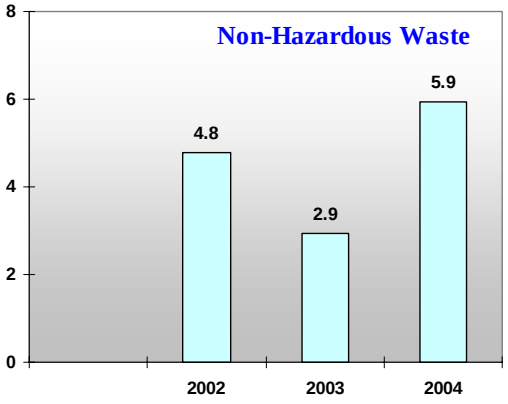
Water Consumption
Raw Water consumed (in million gallons/ month)



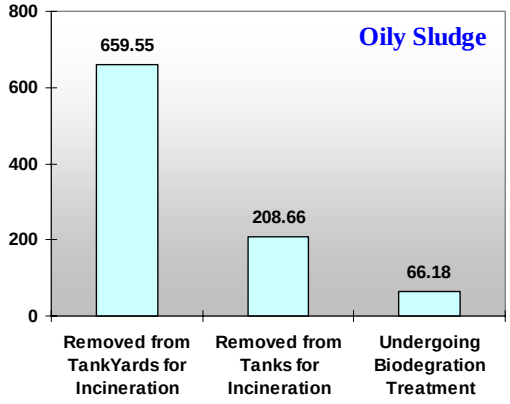
Corrected Energy and Loss Index



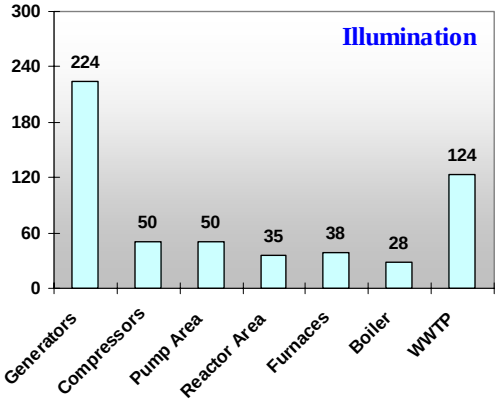
Non-Hazardous Waste
Disposed off for reuse, recycle and landfill (in tons)



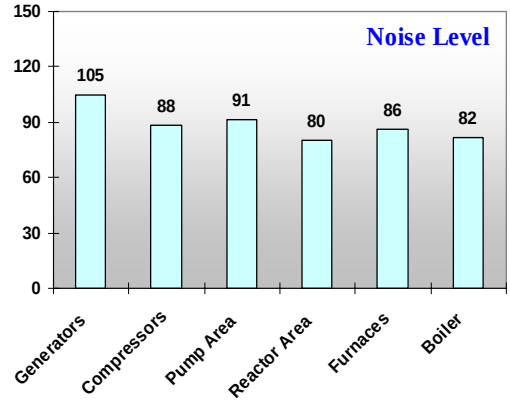
Oily Sludge
Disposal of Oily Sludge from PRL (in tons)



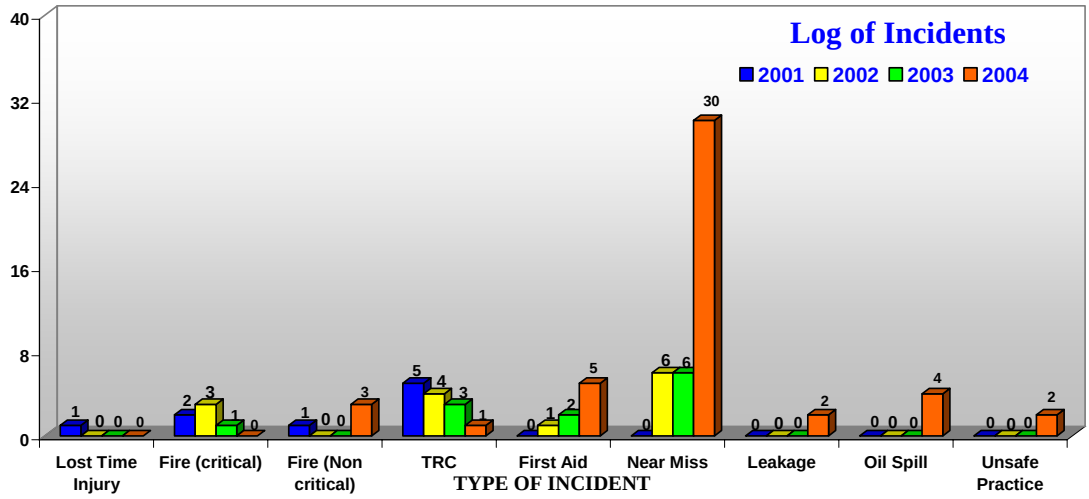
Illumination
at different locations in PRL (in lux)



Noise Level
at different locations in PRL (in dBA)



Log of Incidents

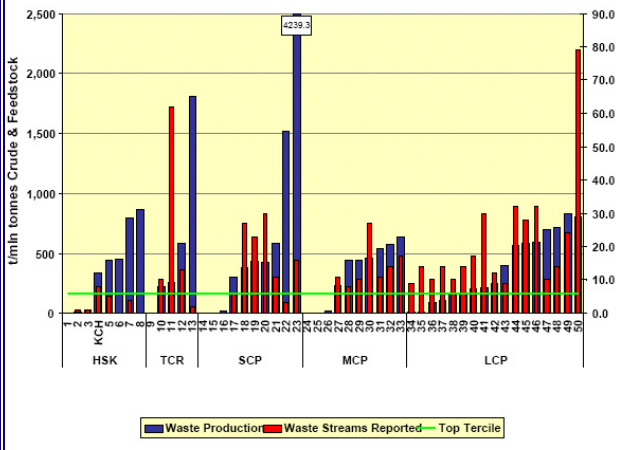


Comparison of PRL with the Group of Best Performers in Oil Sector Internationally

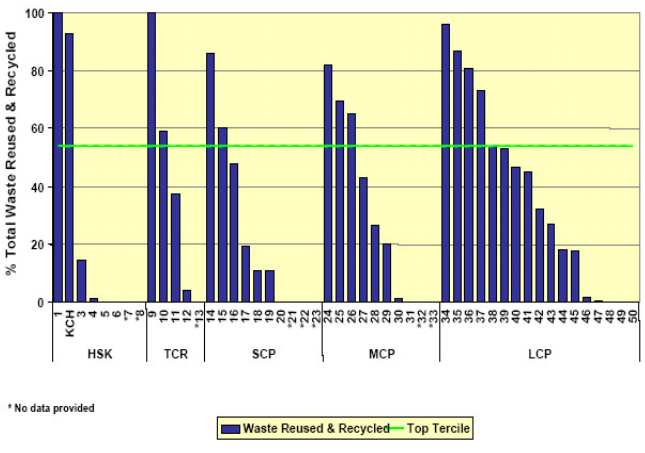
Bench marking of Pakistan Refinery Limited was carried out against the top refineries of the world by Shell Global Solution "International", with the aim to quantitatively assess our standing. KCH in the graphs represents Pakistan Refinery Limited, Karachi. Top Tercile is the average values for the group of best performers.

HSK = Hydroskinmming Refineries
TCR = Thermal Cracking Refineries
SCP = Small Complex Refineries
MCP=Medium Sized Complex Refineries
LCP = Large Complex Refineries
— = Top Tercile

Non Sludge Waste Disposal

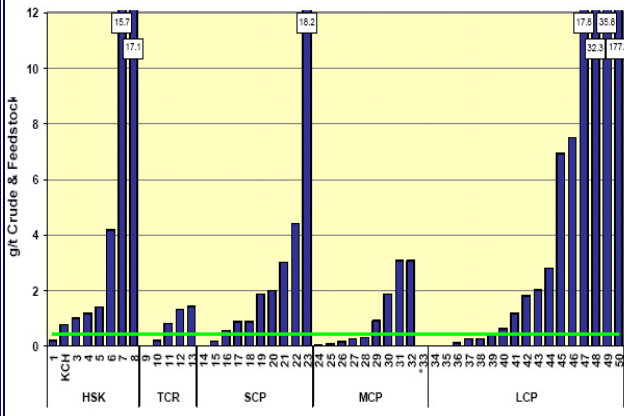


Non Sludge Waste Re-used and Recycled



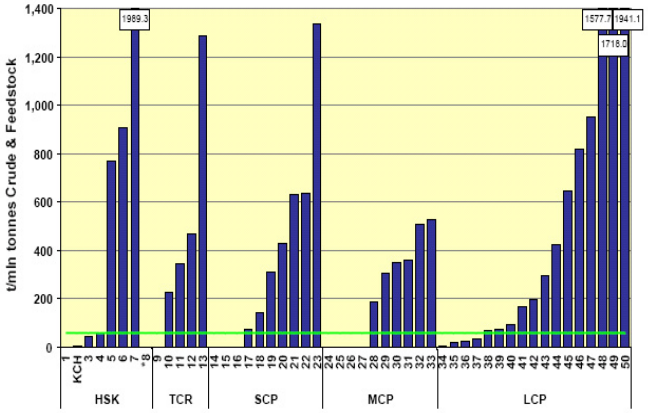
Quantitative Environmental Impact Assessment

Oil Discharge at Refinery's Fence

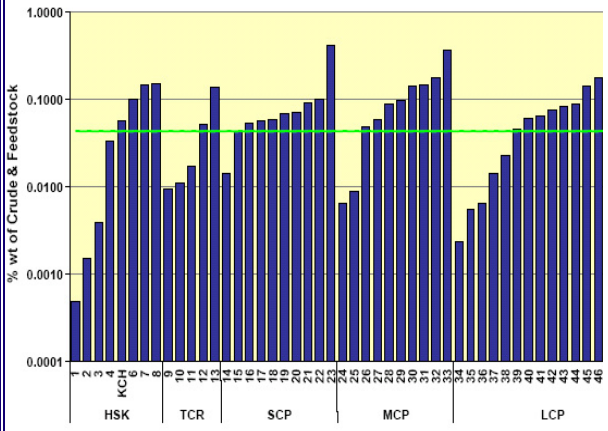


* No data provided

Sludge Disposal

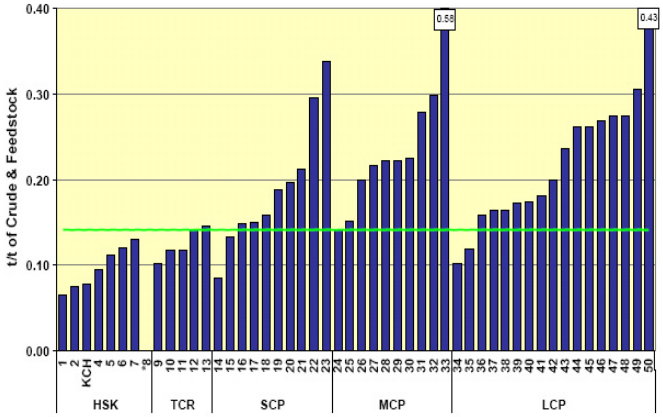


SO2 Emission

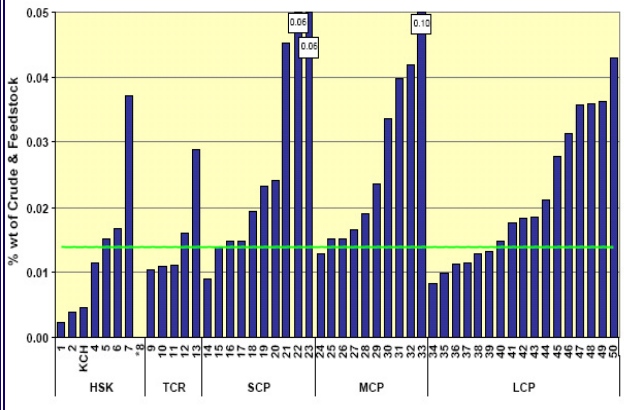


* No data provided

CO2 Emission



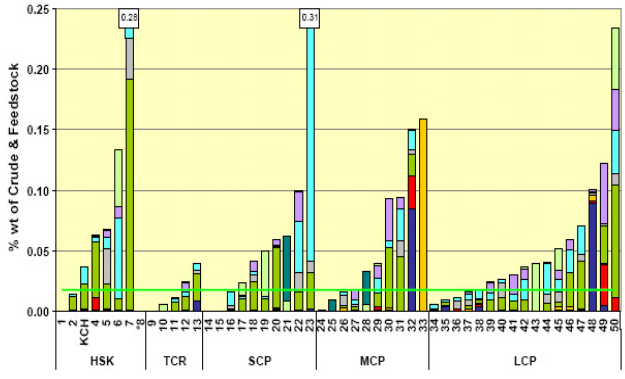
NOx Emission



* No data provided

NOx Emission — Top Tercile

VOC Emission



* No data provided

Flaring, Venting, Combustion, Fugitives, Loading, Storage, Water Treatment, Drains, Other, Top Tercile

Achieved Environmental Objectives and Targets

Effluent Treatment Plant

Effluent Treatment Plant was installed with a cost of 40 million rupees. The objective of this plant was to reduce the pollution charge and bring all effluent parameters being discharged from the refinery premises within the permissible limits of National Environmental Quality Standard (NEQS). The objective was achieved in August 2002

Solid Hazardous Waste Disposal

About 60 ton of used Hydrotreater Catalyst was lying in PRL's warehouse since many years. The aim of this objective was to device a safe and environmental friendly method for the disposal of spent catalyst. The catalyst was disposed off as per Code of Federal Regulation – OSHA. The objective was achieved in June 2003.

Monitoring of Soil and Underground Water Contamination

The objective was to determine the current level of soil and ground water contamination within refinery premises and initiation of program for continuous monitoring on annual basis. The monitoring is being done annually from identified locations. No sludge is being buried in the tank farm area and leakages are monitored regularly. Furthermore, six sludge pits will be constructed by June 2005 for the removal of sludge from tanks in safe and environmental friendly manner.

Elimination of Low Density Asbestos

Low density insulation Asbestos was removed from the pipeline in order to eliminate health and environmental hazard. The objective was achieved in September 2004.

Mechanical Seals on Pumps

The objective for the replacement of glands with mechanical seal on pumps was to minimize fugitive emissions and leakages which is the cause of air and ground pollution. The objective was achieved in November 2004.

Review of Shipping Standards

After the Tasman Spirit incident, shipping procedures were reviewed. The objective was to protect environment and at the same time guarantee business and security of operation. For this, PNSC was taken on board for new vessel vetting procedures. Stasco has been hired to vet the ship before chartering.

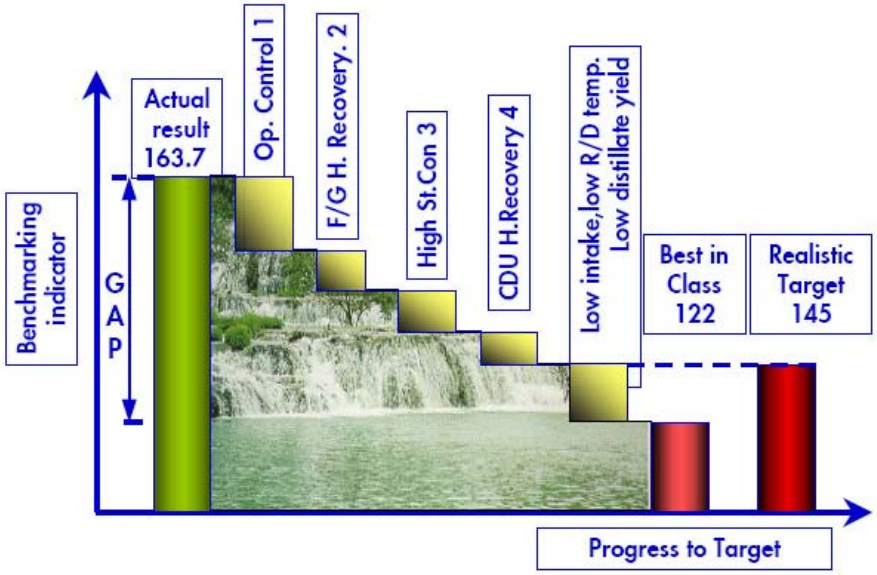
Oil Spill Equipments

PRL participated actively in the development of National Oil Spill Plan. Marine oil spill clean-up equipments worth 5 million rupees, which is capable of handling Tier-I oil spill (upto 7 ton) have been purchased in collaboration with Shell Pakistan and training through external sources carried out.

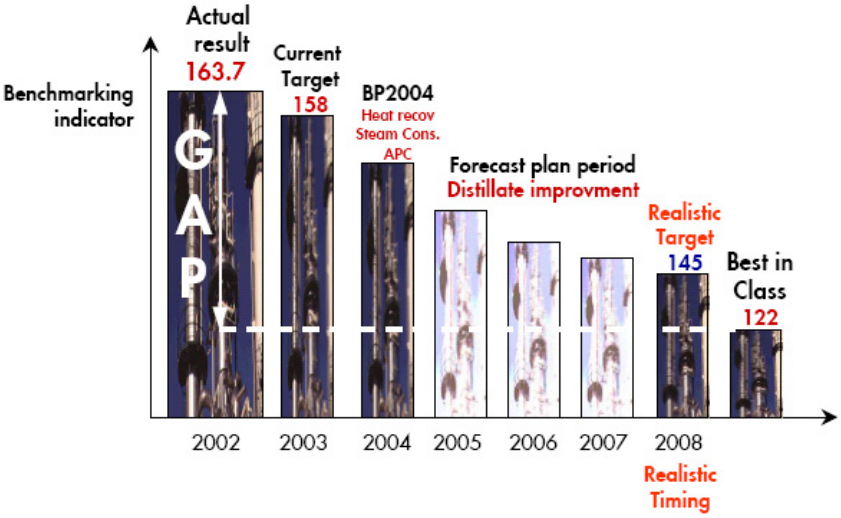
Ongoing Environmental Objectives and Targets

Energy Conservation

The objective is to reduce energy consumption to close the gap between PRL and best in class refineries. Total energy consumption of PRL for the year 2002 was 80,000 tons of standard refinery fuel. This energy consumption is a sum of energy used as fuel, electricity and steam in a ratio of 76%, 8% and 16%, respectively. Corrected energy index which is a ratio of actual versus theoretical SRF requirement was 163.7 whereas; CE index for best in class refinery was 122 in year 2002. The target is to reduce CE index from 163.7 to 145 by year 2008.

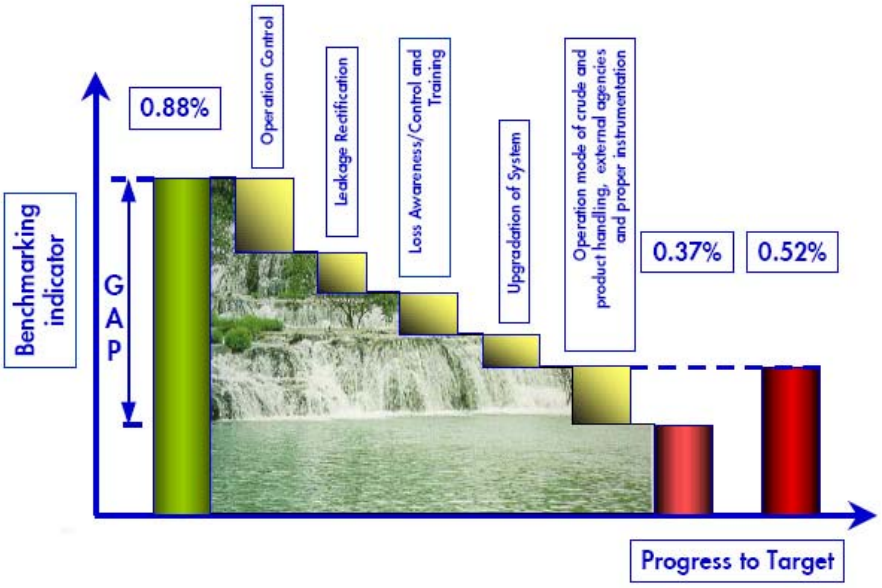


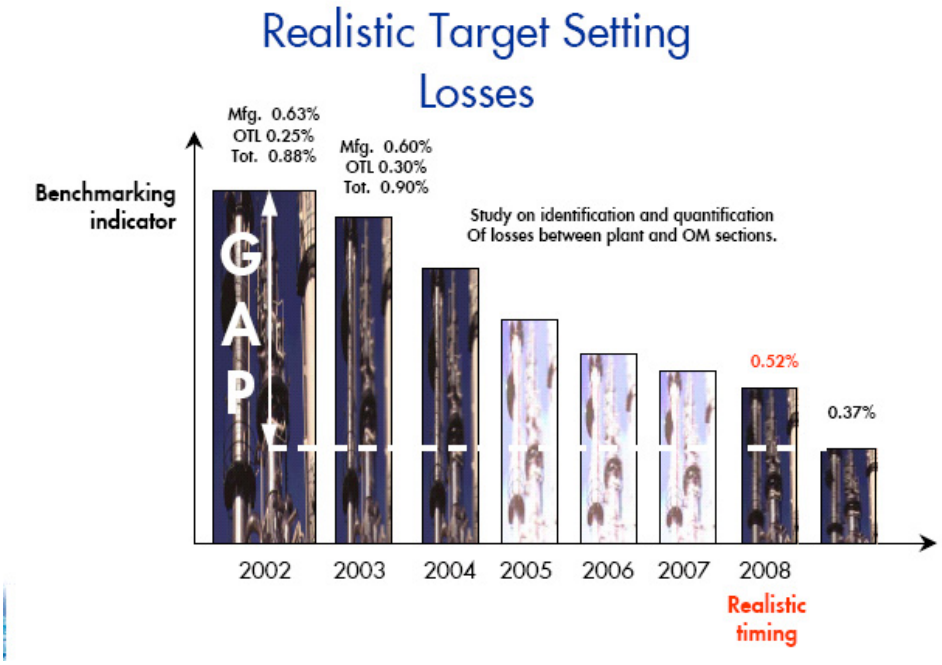
Realistic Target Setting



Oil Loss Control

The Objective is to minimize hydrocarbon losses from crude oil, products, pumping and processing. Hydrocarbon losses in oil movement and process area, lead to the loss of both financial and natural resources. Implementation of operational control and contingency plan to bring the manufacturing loss from 0.63% to 0.60% by July 2004 and further reduce to 0.52% by 2008.





Ongoing Environmental Objectives and Targets

Zero Effluent

Presently waste water is treated in an effluent treatment plant to bring it within NEQS limits and thrown into sea. The objective is to save natural resources and reuse the water.

Aim	Actions to be taken	Owner/Team	Target
Assessment of Quality	Present effluent quality	Operations Manager	September, 04
	Evaluation of parameters and suggest tertiary treatment	Operations Manager	November,04
TOR / Bids	Development of TOR and scope of work. IEE etc.	Operations Manager	December,04
	Arrangement and evaluation of proposals	Operations Manager	March, 05
Budget Allocation	Budget allocation for tertiary treatment	Operations Manager	June, 05

Global Compact

The objective of Global Compact, an initiative of U.N Secretary General Kofi Annan, is a world wide call to help build the social and environmental framework to support and ensure the continuation of open and free market whilst ensuring that people have a chance to share the benefits of new global economy.

The following principles are taken into consideration:

- Human Rights
- Labor Standards
- Environment

Aim	Action to be taken	Owner / Team	Target
Global Compact	• Circulate and understand Principles of Global Compact	HRM / Management Team	August 2004
	• Identify areas of improvement in relation to these principles and make necessary plans where required	HRM / HSEM	December 2004
	• Adherence/ implementation of Global Compact Principles	HRM / Deptt. Heads	June 2005

Capital Expenditure on HSE

Description	Amount Rs (million)
Year 2002	
Kerosene rundown cooler to minimize emissions	3.0
Particulate matter monitoring from stack emission	8.0
Electrical heat tracing of fuel oil line to avoid incomplete combustion in furnaces	1.5
Texas tower – to save 10 million Btu/hr of energy	30.0
Effluent water treatment plant	40.0
Diesel run down cooler	2.5
Crude overhead system – to reduce pressure to avoid R/Vs lifting to atmosphere	15.0
Platforming heaters modification – energy efficiency	50.0
Relief and flare system – study to put further load on flare system	0.5
Year 2003	
Construction of open drain system at Keamari – spill collection	5.0
Heat recovery of flue gases	4.0
Hazardous material storage area	0.4
Flue gas analyzer	1.2
Year 2004	
DCS and APC for crude unit – energy conservation and yield improvement	100.0
Replacement of control valves on crude distillation unit	3.5
Replacement of storm water pump	0.8
Fire alarm system at Keamari	0.3
Control valves for crude unit	3.0
Dike wall for JP-1 pipeline in Malir river bed	2.0
Dust concentration monitoring unit	0.8
Construction of open drain channel at Gantry – spill collection	1.3
Welding fume extractor	0.3
Installation of mechanical seals on pumps	0.2
Heat recovery of flue gases – platformer, crude and hydro furnaces	69.0
Fan ducting in warehouse chemical storage area	0.3
Gas recovery and auto tank gauging - study	1.0
Portable fire water pump	4.0
Modification of hydrants at Keamari and Korangi – subsurface foam injection system	2.0
Fire fighting equipments	1.0
Emergency shut down system for boilers	10.0

Compliance/ Non-Compliance

Compliance

MARKETING AND COMMUNICATION
DIVISION
DIRECTION MARKETING
& COMMUNICATION

Our Ref. PAK/BVQI/545-9/AZ November 26, 2004

Mr. Naman Shah
BS & HSE Manager
Pakistan Refinery Limited
Karachi – Pakistan

Sub: Second Routine Surveillance Visit

Bureau Veritas Quality International confirms that the Second Routine Surveillance Visit of PRL's Health, Safety and Environmental Management Systems against the requirements of ISO 14001:1996 and OHSAS 18001:1999 was performed on November 23 and 24,2004.

During the visit, a high level of compliance was observed and a remarkable adherence to the requirements of the standards was witnessed. The management commitment was fully evident which was also endorsed by employees at different hierarchal levels. As a result of this strong commitment and adherence, no non-conformity (NCR) was identified. **Congratulations!**

This in turn will ensure continuation of your Registration with BVQI till the Re – Certification Visit, which is expected in November 2005. Please be informed that BVQI will keep you update for the due developments well in advance.

We assure you of our best services and cooperation at all time.

Sincerely,

M.S. Saqib
Nominated Certification Officer

Third Party Audit of PRL Korangi and Keamari oil terminal is carried out annually. The objective of this audit is to asses, both these installations against HSE Management System requirements based on ISO-14001:1996 and OHSAS-18001:1999 standard. The audit plan covers all clauses applicable to the activities/ processes/ facilities, which includes policy, environmental aspects/ impact analysis, management commitment, objectives & targets, training records, competence level of employees, monitoring and measurement results, non-conformities, emergency response plan, mock drills, results of internal audit, management review and others.

Non Compliance

Below are the Routine Non-Conformances (NCR) raised during the year.

Brief Description	Raised On	Closed Out Date
Dia 10" Diesel cross-country line leakage in front of Sea View apartments	August 07, 2003	August 30, 2003
Tanker discharge line leakage inside TK-57-58 yard	September 03, 2003	September 05, 2003
Dia 10" Diesel cross-country line leakage in front of anti terrorist court, due to theft attempt	May 18, 2004	June 15, 2004
Furnace oil spill due to tilting of Oil bowzer inside PRL premises	May 28, 2004	July 15, 2004
Records of calibration of flue gas analyzer of some of the furnaces were not available	June 10, 2004	July 06, 2004

Sludge Disposal

Crude oil sludge from tanks was being dumped in tank yards; this has led to soil contamination. In 2004, 66 tons of crude oil sludge was removed from tank yards for landfarming. Concrete sludge pits are being constructed for temporary storage before landfarming.

Mercury bulbs/ lights

Replacement of tube lights/ bulbs with mercuric tube lights/ bulbs has led to increased illumination and energy saving. But there is no arrangement / method available for the disposal of fused mercury tube lights / bulbs. Mercury is a heavy metal and requires special disposal technique.

Use of R-22 refrigerant gas

R-22 refrigerant gas which contributes to ozone depletion is being used in air conditioners. In order to replace R-22 with ozone friendly gas, present air conditioning system has to be replaced.

Oil spills

Oil spills from pipe lines due to theft cases and poor condition of fuel oil bowzers. In 2004 out of 47 incidents, 13 were due to these causes. Oil marketing companies are being forced to improve bowzer quality.

Emergency Preparedness & Response

PRL has an emergency response system to respond to accidents/ emergencies, which could harm or damage healthy, safety and environment and thereby preventing or mitigating the associated health, safety and environmental impacts. The emergency response organization is defined and emergency plan has been established which defines emergency organization, authority/ responsibilities, list of key personnel, internal & external communication plan, detail of emergency services.

The effectiveness of the emergency plan and extend of its preparedness is tested by conducting routine drill and mock drills. Different scenarios are such as oil/ chemical spill, fire, gas release, bomb threat and others are created in mock drills. One mock drill is held annually, each at PRL Korangi and Keamari Terminal.

Communication with Stakeholders

- Complete HSE orientations including environmental issues are discussed with internees on internship training (4-6 weeks), who come to refinery from universities & colleges of Sindh, Punjab, Balochistan, NWFP and foreign countries.

- HSE orientation and environmental issues are also discussed with groups who came to refinery on visits. They included air force, army, navy and school children of Greenland Grammar school, Habib Public school, etc.

- Helped PARCO, FFC, Attock Refinery in establishing their HSE Management System based on international standard.

- Suggestions and complaints from all stakeholders are dealt with under defined procedure:
    - Brief HSE performance is published in Annual Financial reports.
    - HSE sub-committee meetings (03 nos.) quarterly.

- HSE issues are discussed with oil marketing companies at different forums.

- Employees' communication meeting is held bi-annually.

- HSE suggestion boxes have been provided at different locations.

- Tool-box talks are given to employees before each job.

- HSE News letter is published bi-annually.

- Safety award for employees/ contractors.

Working for Cleaner Environment

Lead Phased Out

Tetra Ethyl Lead (TEL) was used to boost the octane number of gasoline and consequently being discharged into the atmosphere through vehicle emissions. Lead is one of the five criteria air pollutants. Lead accumulates into human body and is classified as Group - 2B carcinogen by International Agency for Research on Cancer (IARC). PRL by accepting its responsibility towards community and environment phased out usage of TEL (under government directive). The remaining drums of TEL of approximate worth 6 million rupees were shipped back to its original vendor (Octal - USA) on PRL's account.

Plantation of Trees

As expression of our commitment towards cleaner and healthy environment, plantation of trees is done regularly. This year approximately 1200 trees of coconut and other local species were planted.


ISO 9001:2000
CERTIFIED LABORATORY
UKAS
ISO 14001:1996
CERTIFIED COMPANY
UKAS
OHSAS 18001:1999
CERTIFIED COMPANY
UKAS
Information Technology Policy
Bringing about change in medium of information flow through the introduction of "Paperless Environment"
KARACHI STOCK EXCHANGE
TOP COMPANIES AWARDS
2003
DNV
LOSS CONTROL MANAGEMENT
CERTIFIED
BRITISH SAFETY COUNCIL
ORGANIZATIONAL MEMBER

Accreditation

Third Party Assessor's Statement

Certification Objectives and Scope

Bureau Veritas Quality International (BVQI) was appointed as independent assessor to carry out the third party assessment of Health, Safety and Environmental Management System of Pakistan Refinery Limited in accordance with the requirements of International Standards ISO 14001:1996 and OHSAS 18001:1999. The main objective of this assessment was to evaluate PRL's commitment towards the establishment and adherence of the said standards and also to verify the compliance of various regulatory and statutory requirements such as National Environment Quality Standards (NEQS) 2000, to which PRL subscribes.

The assessment carried out in the year 2002 resulted in the Certification of Pakistan Refinery Limited towards ISO 14001:1996 and OHSAS 18001:1999 valid for a period of three years.

The scope that was covered during the assessment included refining, storage and distribution of crude oil and petroleum products in the refinery at the Korangi Creek and Keamari Depot.

Continuous Monitoring

As per the certification policy and IAF (International Accreditation Forum) Guidelines, it is obligatory for organizations to undergo continuous monitoring by the certification body to ensure compliance to requirements on an on-going basis. Bureau Veritas Quality International (BVQI) has been performing regular surveillance audits every year and found the implementation of the requirements in full effect. Also major improvements were observed in the areas of Health, safety and environment, providing evidence to the core theme of the standards which require organization to continually improve its HSE Management System once it subscribes to certification.

Verification Method

The assessment scheme is based on review of environmental aspects identified by PRL which have significant impact on environment. Similarly all health and safety hazards having associated significant risks are reviewed. Representative samples are selected from activities of PRL and audited for compliance against requirements of ISO 14001:1996 and OHSAS 18001:1999.

A detailed site tour of Refinery and Storage Areas in Korangi and Keamari is also performed in every visit to ensure that operational controls are effectively established and implemented. The emergency preparedness and response plans are also tested to ensure that organization is well equipped to respond to any untoward incident or accident. The continuous monitoring of PRL's HSE System has provided confidence to BVQI that the system is effectively and efficiently functioning in compliance to recognized regulatory and statutory requirements as well as requirements of ISO 14001:1996 and OHSAS 18001:1999.

Responsibilities of Executive Management` and Verifier

As per PRL's HSE Management Manual, the ultimate responsibility of ensuring the adequacy of the HSE Management system lies with the Chief Executive Officer and General Manager who is/ are responsible for continuous observance to stated and implied requirements of health, safety and environment at all times.

Bureau Veritas Quality International (BVQI) has not been involved in the development or consultation of PRL's HSE Management System at any point in time and has

maintained the independence and credibility during the entire certification process.

Opinion

Transparency and Completeness

The management system in response to requirements of ISO 14001:1996 and OHSAS 18001:1999 intends to cover significant environmental impacts and health and safety risks. The management programs cover minute details to meet the objectives and targets established by the organization in order to continually improve it HSE performance. The objectives and targets are regularly assessed and management programs are reviewed and audited by BVQI to ensure progress towards meeting HSE commitments.

The Environmental Report 2004 clearly reports objectives, programs, and measures taken by PRL to ensure its continued commitment and it is BVQI's opinion that the text and data have been presented in a fair and balanced manner.

The stakeholders are regularly informed through effective communication procedures about the health, safety and environmental performance and key issues which require their attention. We look forward to stakeholders' opinions on the issues covered in this written report and the process for this being presented in a transparent manner.

Accuracy

The Health, safety and environment performance reporting system is effective, generating data which when aggregated at a corporate level is generally accurate and reliable. The system is well incorporated in the business processes, with a high level of commitment noted during the assessment process.

Health, Safety and Environmental Strategy

Noted progress has been accomplished in implementing the PRL's HSE strategy which resulted in commissioning of effluent treatment plant, effective solid hazardous waste management, continuous monitoring of soil and underground water contamination, elimination of low density asbestos, replacement of glands with mechanical seals on pumps, review of shipping standards and procurement of oil spill equipment, resulting in compliance towards the requirements of ISO 14001:1996 and OHSAS 18001:1999 and strong adherence to PRL's own commitment of being an environmental friendly, employee health and safety conscious organization.

As a proactive measure towards meeting the future challenges and maintaining company's image and credibility, Bureau Veritas Quality International (BVQI) proposes PRL to initiate Risk Based Inspections to minimize operational risks, optimize equipment availability, avoid assets damage and minimize business interruptions.

M.S. Saqib
Nominated Certification Officer
BVQI-Pakistan

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