



IndianOil

Indian Oil Corporation Limited
(Refineries Division)

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INDIANOIL REFINERIES-MARCHING TOWARDS GREATER GLORY

PERFORMANCE PAR EXCELLENCE-HIGHLIGHTS FOR FINANCIAL YEAR 2010-11

The year 2010-11 will go into annals of the Corporation's history for placing Indian Oil on the pedestal of corporate glory with Indian Oil becoming India's No.1 Refiner. After expansion of Haldia Refinery from 6 to 7.5 MMTPA and Panipat Refinery from 12 to 15 MMTPA, Indian Oil's group refining capacity has increased from 62.7 MMTPA to 65.7 MMTPA thereby becoming the largest refiner of India.

The achievement was suitably acknowledged by dedication to the Nation of Once-Through Hydrocracker unit and Capacity expansion of the Haldia Refinery by Hon'ble Finance Minister, Govt. of India in the presence of then Hon'ble Minister of P&NG and other distinguished dignitaries on 25.12.2010.

Indian Oil's first and India's largest Naphtha Cracker at Panipat was also dedicated to the Nation by Hon'ble Minister of P&NG, Govt. of India on 15.02.2011 in presence of distinguished dignitaries.

IOCL refineries recorded highest ever crude t'put of **53.0 MMT** during the fiscal surpassing the previous best of **51.4 MMT** achieved in 2008-09. Overall capacity utilization of **102.0 %** was achieved by Indian Oil Refineries with coordinated efforts of Corporate Office, Marketing Division, Pipelines Division, R&D and Refineries Division. Overall capacity utilization was more than **100%** for the fourth year in a row.

Combined distillate yield of all the IOCL Refineries could also be sustained at **75.3 wt%** for the second year in succession despite planned revamp / M&I shut downs and implementation of quality upgradation projects in all the refineries.. Haldia Refinery recorded the highest ever distillate yield of **64.2 wt%** surpassing the previous best of **63 wt%** in 2008-09.

On the Energy Conservation front, our relentless efforts resulted in reduction of overall specific energy consumption to lowest ever **59.5 MBTU/BBL/NRGF** (MBN) during 2010-11 against the earlier lowest of 62 in 2009-10. This has been possible through implementation of various energy saving schemes and close monitoring of energy parameters. A total of 70 schemes have been implemented during the year with a potential saving of 93,600 SRFT/year.

GOLDEN YEAR OF COMMISSIONING

Major projects commissioned during the year:

- Capacity augmentation of Panipat Refinery to 15 MMTPA.

Revamping of AVU-I was completed and was successfully commissioned on November 7, 2010. With this the crude processing capacity of the Refinery is enhanced from 12.0 MMTPA to 15.0 MMTPA.

DCU and OHCU were also revamped to augment their capacity from 2.4 MMTPA to 3.0 MMTPA and from 1.7 MMTPA to 1.9 MMTPA respectively. These units were started after revamp on 07.11.10 and 19.11.10 respectively.

Massive job of 1.25 Lakh inch meter dismantling of piping, 75000 Inch Dia Piping welding, 2.0 Lakh Inch Meter Piping erection, 287 Equipment erection/ re-location, along with 872 field instruments and 130 nos. of new motors, were carried out and commissioned during the shutdown, with the peak strength of workforce crossing 7000 mark.

- **Balance Units of Naphtha Cracker Project at Panipat**

After commissioning successfully India's largest and world class Naphtha Cracker Unit in Mar'10 in record time, following units in the complex were commissioned in current fiscal:

- ❖ Associated Units viz. Pyrolysis Gasoline Hydrogenation Unit (PGHU), C4H hydrogenation & Benzene Extraction unit were commissioned on 3rd, 9th & 10th April'10 respectively.
- ❖ Monoethylene Glycol (MEG) Unit of 180 TMTPA capacity was commissioned on 17th April'10
- ❖ Poly Propylene Unit comprising of two chains of 300 TMTPA capacity each was commissioned. (Line-1 on 23.05.10 and Line-2 on 13.4.10) heralding Indian Oil's entry into plastics industry.
- ❖ LLDPE/HDPE Swing Unit of 350 TMTPA capacity was commissioned on 9.5.10
- ❖ HDPE Unit of 300 TMTPA capacity was commissioned on 18.5.10 and demo run completed in Feb'11

- **Residue Upgradation and MS/HSD Quality improvement Project at Gujarat**

To improve the bottom of the barrel, various units were commissioned under Residue Upgradation Project at Gujarat Refinery during the year 2010-11. Quality upgradation part of RUP consisting of DHDT, HGU, ISOM & SRU commissioned progressively from May'10 to Jul'10. Details are as under.

- ❖ **Quality improvement projects under RUP:**

- **2.2 MMTPA capacity DHDT unit** licensed by Axens, France was successfully commissioned on 09th June, 2010. The objective of the Diesel Hydrotreater (DHDT) Unit is to produce low-sulphur Diesel of BS-III & IV grade along with Cetane improvement. The actual installation and commissioning time of 37 months 23 days of DHDT unit compares with project of similar nature & capacity in different parts of country and is ahead of average time taken by Indian Plants.
- **72.5 TMTPA capacity HGU unit** licensed by Haldor Topsoe was successfully commissioned on 20th May, 2010.
- **230 TMTPA capacity ISOM unit** licensed under UOP LLC, USA was successfully commissioned on 18th July, 2010. The ISOM unit produces high octane low sulphur/ benzene/ olefin Isomerate which is a blending component for production of BS-III / IV grade MS
- **2 x 300 MTPD SRU**, licensed by Black & Veatch, USA was successfully commissioned in two phases. Train-1 was commissioned on 30th June, 2010 and Train-2 on 29th July, 2010.
- Pelletisation plant of SRU was successfully commissioned on 14th October, 2010. The Pelletisation unit consists of 6 Roto-formers which can produce 600 MTPD of Solid Sulphur Pellets. Handling of Sulphur in Pallet form is a low health hazard operation than handling of lumps. Sulphur pellets, thus produced, have applications in Pharma, Rubber and Chemical industries.

- **Other units/ facilities under RUP:**

- **2.1 MMTPA** capacity **VGO-HDT** licensed by UOP LLC, USA was successfully commissioned on 25.11.2010. With the commissioning of this unit, Gujarat Refinery can process higher proportion of HS crude in its crude mix.

- **30 MW** capacity of Gas Turbines (GT-5) was successfully commissioned on 28th October, 2010.

- ❖ Delayed Coker Unit:

Indian Oil's largest Delayed Coker Unit of 3.7 MMTPA capacity is in advanced stage of commissioning and expected to be on stream during this fiscal. The Coker Unit with Technology from M/s Foster Wheeler, was executed as a part of Residue Upgradation Project at Gujarat Refinery to increase the distillate yield of refinery from 68% to 75%.

- MS Quality Upgradation at Guwahati/Barauni/Digboi

For production of BS-III quality MS, quality up gradation projects have been commissioned at Guwahati, Barauni & Digboi:

- Guwahati

- ❖ 3-Cut splitter commissioned on 14.5.10.
- ❖ NSU commissioned on 02.9.10
- ❖ NHDT commissioned on 29.9.10
- ❖ ISOM commissioned on 12.12.10

Earlier bench mark for such projects in North Eastern region: 44 months. Current execution time of 32 months is a record.

- Barauni

- ❖ HGU commissioned on 17.9.10
- ❖ NHDT commissioned on 22.10.10
- ❖ ISOM commissioned on 12.12.10
- ❖ FCC-GDS commissioned on 18.12.10

Earlier bench mark for such projects in the region: 38 months. Current execution time of 32 months is a record.

- Digboi

- ❖ NSU commissioned on 14.9.10
- ❖ RSU commissioned on 20.9.10
- ❖ NHDT commissioned on 27.10.10
- ❖ ISOM commissioned on 28.12.10.

Earlier bench mark for such projects in North Eastern region: 44 months. Current execution time of 32 months is a record.

Achieving greater heights:

- Guwahati, Barauni, Haldia and Panipat Refineries achieved highest-ever crude throughputs of **1118 TMT, 6202 TMT, 6884 TMT and 13667 TMT** respectively surpassing the previous best of 1078 TMT(2009-10), 6184 TMT (2009-10), 6042 TMT(2008-09) and 13615 TMT (2008-09) respectively.

- Gujarat, Barauni and Panipat Refineries achieved highest ever FCCU throughputs of **1917 TMT, 1550 TMT and 860 TMT**, surpassing the previous highest of 1811 TMT (2006-07), 1502 TMT (2009-10) and 854 TMT (2008-09) respectively.

- Mathura Refinery achieved highest ever OHCU throughput of 1258 TMT surpassing the previous best of-1203 TMT (2002-03).
- Panipat, Guwahati and Digboi Refineries achieved highest ever DCU t'put of **2415 TMT, 450 TMT** and **229 TMT** surpassing previous best of 2359 TMT (2008-09), 415.1 TMT (2009-10) and 225 TMT (2006-07) respectively.
- Haldia Refinery achieved highest ever LOBS production of 248 TMT surpassing previous best of 234 TMT in 2008-09.
- All Refineries have surpassed their earlier best Specific Energy Consumption. The performance w.r.t. MBN is listed below:

Refinery	MBN for the year 2010-11	Previous Best	
		MBN	Year
Guwahati	60.5	65	2009-10
Barauni	59.0	62	2009-10
Gujarat	63.5	66	2009-10
Haldia	59.0	63	2009-10
Mathura	58.0	62	2009-10
Digboi	69.5	76	2009-10
Panipat	54.5	55	2009-10
Bongaigaon	83.0	86	2009-10
IOCL	59.5	62	2009-10

The superlative performance of the Refineries in energy conservation was suitably acknowledged in the form of several prestigious awards like Jawaharlal Nehru Centenary award (2 Nos.), Oil & Gas Conservation Fortnight (OGCF)- 2010 award (5 Nos.) etc.

- IOC Refineries achieved record overall production of LPG, MS, ATF and HSD in 2010-11 as indicated below:

Figs in TMT

Products	Year 2010-11	Previous Best
LPG	1880	1733 (2009-10)
Total MS	5118	4954 (2009-10)
BS-III MS	3464	1392(2008-09)
BS-IV MS	1137	-
ATF	2555	2147(2009-10)
HSD		
BS-III HSD	16493	4140 (2008-09)
BS-IV HSD	3492	-

Strides Towards a Greener world:

With a mandate to strive for a greener world, state of the art technologies were implemented at all the refineries for production of green fuels meeting global standards. The MS/HSD quality improvement projects at all Refineries have been completed and started producing & supplying BS-IV/ BS-III grade Motor Spirit and High speed Diesel. Innovative blending optimization & stream sharing of Isomerase/Reformate/Py-Gas among refineries was also done for production of BS-III MS. We have successfully met the challenge of supplying Green Fuels as stipulated in Auto Fuel Policy of India ahead of schedule.

SALIENT FEATURES:

Innovating For GROWTH:

GRM IMPROVEMENT

STREAM SHARING:

Initiatives of sharing intermediate streams among Indian Oil group of Refineries continued to utilize spare capacity of a particular unit of a refinery and to remove bottleneck in other refineries for increasing overall capacity utilization and profitability.

New stream sharing initiatives taken during the year include:

- ❖ Movement of Isomerase+Reformate from Mathura to Barauni and Guwahati
- ❖ Py-Gas movement from Panipat to Barauni and Guwahati
- ❖ DHDT feed movement from Bongaigaon to Mathura.
- ❖ Light naphtha movement from Digboi to BGR.

Highest ever, **816 TMT** of intermediate streams viz 22.4 TMT Isomerase+Reformate from Mathura to Guwahati and Barauni, 4.6 TMT Isomerase+ Reformate from Panipat to Guwahati, Mathura and Barauni, 17 TMT Py-gas from Panipat to Guwahati and Barauni, 297 TMT of Diesel Hydrotreater Feed Stock from Bongaigaon to Guwahati, Barauni and Mathura, 2.5 TMT of Diesel Hydrotreater Feed Stock from Haldia to Barauni, 164 TMT of Px Naphtha from Mathura to Panipat, 90.6 TMT of PNCC Naphtha from Mathura to Panipat, 60.9 TMT Reformate from Gujarat, Barauni and Digboi to Guwahati, 112 TMT IFO from Gujarat to Panipat, 5.6 TMT Foots Oil from Digboi to Guwahati, 12.7 TMT Light Naphtha from Digboi to Bongaigaon, 21 TMT SRN from Guwahati to Digboi, 9.8 TMT Reformate from Digboi to Guwahati etc were shared. This is a major factor in achieving the throughput and distillate yield. This has also helped in enhancing GRM of IOC refineries. An estimated benefit of Rs 308 Crores was realized from stream sharing during the year.

USE OF NG /RLNG IN GTs AND HGU's IN PLACE OF NAPHTHA/ DIESEL.

In order to enhance the GRM of Gujarat, Mathura and Panipat Refineries, and also to reduce green house gas emissions by replacing Naphtha used in HGU's as feed/ fuel and replacement of Naphtha/HSD used in GTs as fuel following actions have been taken:

1. Agreements signed for supply of gas:
 - Gas Transmission Agreement (GTA) with GAIL for Gujarat, Mathura and Panipat signed on 21.4.10.
 - Gas Supply and Purchase Agreement (GSPA) with RIL and GTA with RGTIL for supply of 0.9 MMSCMD KG D-6 Gas signed on 9.6.2010.
 - GTA with GSPL for supply of RLNG to Gujarat Refinery signed on 1.6.2010.
2. Accordingly gas supply to Gujarat, Panipat and Mathura started as follows:
 - Supply of RLNG sourced through PLL (Petronet LNG Limited) to HGU's at Mathura using LP Pipeline of GAIL from May, 2010 and using HP Pipeline from Sept, 2010.
 - Supply of RLNG to Gujarat using GSPL Pipeline started from June, 2010
 - Reliance KG D-6 gas to Gujarat w.e.f 12.08.2010.
 - Supply of RLNG to Panipat using Dadri Panipat Spur Pipeline started from August, 2010.

54 MMSCMD of RLNG was procured on spot basis from PLL during Sep-Oct, 2010 to meet the additional Gas requirement, To meet the future requirement, agreement has been made for supply of RLNG @ 1.37 MMSCMD during the period April-Dec, 2011 and @ 2.28 MMSCMD during the period Jan-Dec, 2012. Further, in view of nonavailability of 0.70 MMSCMD of KG D-6 gas to Mathura Refinery as per allocation by MOP&NG, additional RLNG has been sourced through PLL.

SPREADING WINGS:

PRODUCT EXPORT

Making foray into new markets, beyond the national boundaries to sustain the crude t'put and profitability, IOC Refineries exported following products:

Figs in TMT

Products	Year 2010-11
Naphtha	2181.0
FO	562.0
LDO	95.5
Bitumen	40.9
Total Export	2879.4

NEW FACILITIES COMMISSIONED / INAUGURATED:

- Commissioning of SRUs at Haldia and Panipat Refineries.

Fourth Sulphur Recovery Unit of 80 MT per day capacity at Haldia was commissioned on 22nd November 2010.

A 225 MT per day capacity Sulphur Recovery Unit was commissioned on March 2, 2011 at Panipat Refinery. The new unit was added under Panipat Refinery Additional Expansion Project (PRAEP).

- Commissioning of 4th Gantry at Panipat Marketing Complex.

In order to facilitate unloading of Naphtha from other Refineries as feed stock to NCU, Naphtha gantry at Panipat Marketing Complex (4th Gantry) was commissioned on 26th November, 2010.

- Electro-Chlorinator System Commissioned at Guwahati/Digboi

In line with corporate policy to dispense with the use of Chlorine tonners in refineries on safety ground, Electro-Chlorinator System of capacity 2 KG Chlorine/ hr capacity, which converts common salt by means of electrolysis into 1st grade Sodium Hypo Chlorite (ELECTRO HYPO), was commissioned in Sept'10 at Guwahati, replacing Chlorine gas as biocide and eliminating safety hazards of handling Chlorine Tonner.

Electro-chlorination system of 1 Kg/hr capacity was installed and commissioned in the second Cooling Tower (wax sector) of the Digboi Refinery on 1st Sept'10. Earlier Electro-chlorination system of 2 Kg/hr capacity was installed and commissioned in fuel sector on 2nd Jul'10. With this, Digboi Refinery has been successful in completely phasing out the use of Chlorine gas as biocide and eliminated the hazards associated.

- Flare gas Recovery System at Gujarat and Panipat:

Flare gas recovery system at Gujarat and Panipat (in PR PX & PREP) Refineries were commissioned on June'10 and .Feb'11 respectively.

- Amod- Hazira Section of KDPL commissioned

Amod- Hazira section of KDPL was commissioned on 10.07.10 by pumping 7 TKL of BS-III HSD from Gujarat Refinery.

REDEFINING GROWTH & PROGRESS:

NEW PROJECTS APPROVED

- Capacity Revamp of FCCU at Mathura from 1.3 to 1.5 MMTPA

The project was approved by IOCL Board in Jul'10. The approved cost of the project is Rs. 1000 Cr with commissioning schedule of Jan, 2013.

➤ Brief status:

- ❖ M/S Technip KTI has been engaged as EPCM consultant on 08.10.10.
- ❖ Process Package for PRU completed.
- ❖ Contracts for Soil Investigation work, Barricading work, Construction of 6 nos. Substation Buildings awarded
- ❖ Techno-commercial evaluation of bids of Wet Gas Compressor (WGC), Main Air Blower (MAB), and PRU Compressor completed.
- ❖ Enquiries for vessels, pumps and 1st MTO issued.

• Styrene Butadiene Rubber (SBR) project at Panipat.

A 120 TMTA Styrene Butadiene Rubber (SBR) project at Panipat at cost of Rs 890 Crores was approved on 30.11.09 and JV formation completed in July'10.

➤ Brief status:

- ❖ PMC awarded to UDHE on 13.09.10
- ❖ Indian Oil will be implementing on behalf of JV-ISRL (Indian Synthetic Rubber Ltd)
- ❖ FEED (Front End Engineering Design) completed.
- ❖ LSTK award-expected during Apr'11
- ❖ Environmental clearance expected by May'11
- ❖ Completion by January'13.

• Following important AF projects have been approved during the Year 2010-11.

S.No	Name of AF Proposal	Approved	Cost(Rs. Cr.)
1.	In principle approval for installation of INDAdaptG Unit at Guwahati Refinery for upgradation of heavy gasoline from 3-cut splitter of INDMAX to BS-III MS	Apr'10	60.0
2.	Installation of sulphur Pelletising unit at Mathura Refinery	Jun'10	66.0
3.	Installation of sulphur Pelletising unit at Panipat Refinery	Jul'10	109.0
4.	3 rd source of fresh water supply at Mathura Refinery.	Aug'10	22.5
5.	CO Boiler bypass facility of RFCCU at Haldia Refinery	Sept'10	16.0
6.	Preheat improvement and decongestion of exchanger train in AU-3 at Gujarat Refinery	Oct'10	8.66
7.	Resitement of Wax Pelletisation unit from Barauni to Digboi Refinery.	OCT'10	13.0
8.	Installation of 1x25000KL HSD tank along with associated facilities at Mathura Refinery for segregated storage and Handling of BS-III& BS-IV	Nov'10	35.6
9.	Procurement & installation of High Volume Long Range Monitors in all eight refineries.	Nov'10	186.0
10.	Proposal for first stage approval for production of Butene-1 at PNCC-Panipat	Dec'10	134.0
11.	Natural Gas as feed instead of Naphtha in HGU-I at Gujarat Refinery	Jan'11	82.2
12.	Unloading facility of RCO at Barauni Refinery for stream sharing with other Refineries	Jan'11	9.02
13.	Hydrocarbon Gas Detection system except Guwahati.	Jan'11	40.2
14.	Rim-seal fire protection system in external floating	Jan'11	325.3

	roof tanks at all Refineries		
15.	Replacement of hammer blind /valves with Pressure Balanced Plug Valves for Barauni, Haldia, Mathura & Panipat	Jan'11	24.9
16.	Installation of 6 th GT/HRSG at Gujarat Refinery.	Mar'11	375.0

PROJECTS UNDER IMPLEMENTATION – IMPORTANT MILESTONES.

- Paradip Refinery Project (PDRP)
 - ❖ HAZOP study completed for all the Process Units, Utilities & Offsite facilities and facilities under BOO/BOOT & LSTK packages.
 - ❖ 60% Model review completed for all the Process Units, Utilities & Offsite facilities and facilities under BOO/BOOT & LSTK packages, while 90% Model review completed for VGOHDT, DHDT, HCDS (Hydrogen Compression and Distribution System), AVU/SRLPG TREATER and INDMAX & PRU (except R & R section).
 - ❖ To expedite execution, the balance works of EPCM-1 was split into 3 LSTK contracts which were awarded in November'10. This mid course correction eliminated 15 Civil & Structural, building and composite mechanical, electrical & instrument contracts (conventional).
 - ❖ During this financial year 32 contracts have been awarded, which includes the contracts for Piling, Civil & Structural, Mechanical & piping for various packages, Cooling Tower, Flare, ETP and Heavy Transport etc.
 - ❖ Total 1264 nos. of orders for PDRP project has been placed valuing Rs. 3417.18 Crore including Lining up of Firm Contract for Integrated Control System for PDRP at a cost of Rs. 77.12 Cr.
 - ❖ LC opening process has been re-engineered. All letter of credits (LC) against import orders established within 15 days of issuance of Fax of acceptance (FOA).

Paradip Site Construction

- ❖ Paradip Refinery Project achieved a new Milestone of Continuous pouring of 3000 M³ of RCC by L&T for the Reactor & Regenerator (R-R) Section of INDMAX (FCC) unit.
- ❖ 330 nos. Quarters have been constructed and handed over during the financial year and total 490 nos. quarters are made available till March'11. Guest House is now fully functional. Hospital building is ready and First Aid started functioning for hospital building with periodic visit of doctors.
- ❖ A Skill Development Centre (SDC) at Paradip Refinery Project has been constructed at site to develop skilled industrial workers for project execution in critical areas like welders, fitters, grinders etc. as a measure to overcome constraint in availability of skilled workers.
- Butadiene Extraction Unit (BDEU) at Panipat
The project was approved by IOCL Board in Nov'09. The approved cost of the project is Rs. 341.50 Cr. with commissioning schedule of Feb'13.
 - Brief status:
 - ❖ Layout and P&IDs issued for engineering,
 - ❖ MRs for all critical long lead items issued,
 - ❖ Ordering of all Vessels (20 nos.) completed
 - ❖ Warehouse/Barricading works awarded on 04.3.11.
- MS Quality upgradation at Bongaigaon

- ❖ Phase-I facilities for 80% MS upgradation to Euro-III quality commissioned on 13.3.10.
 - ❖ Balance job of upgradation of existing unit is expected to be completed by May'11
- Diesel Hydrotreater (DHDT) project at Bongaigaon
In advanced stage of completion and expected to be commissioned by April, 2011.
- **INITIATIVES OF CENTRAL PROCUREMENT CELL**
 - ❖ Central Procurement Cell (CPC) lined up total 30 numbers of ARC amounting to Rs. 704 Crore which is approximately 61% of total annual usage of Refinery Division for Operation and Maintenance. This has resulted in savings ranging from 3% to 30% in different ARC amounting to total Rs.15 Crore, based on previous average / extrapolated rates.
 - ❖ Significant reduction in codification time achieved during this Financial Year from 1-3 months to 15 days. Special priority was given for PDRP project for which the codes were given within two working days. Approx. 1.27 lakh items were codified during this year.

HIGH POINTS:

IN-HOUSE EFFORTS BY PROCESS DESIGN AND ENGINEERING CELL

- Studies and Trouble shooting for Overseas Refineries:
 - Study of high fuel and loss problem at Kenya Refinery of M/s Essar Oil Limited was taken up in July 2010 and report submitted.
 - PDEC was awarded the job to Revamp Amine Treating and Regeneration facilities at Emirates National Oil Company, Dubai (ENOC). The first phase of the report has already been submitted and the recommendation of PDEC has been accepted by ENOC.
- Process packages:
Process packages were developed for revamping/ modification jobs in various refineries. Some of the major jobs are as under:
 - Study to improve pre-heat in AU-3 unit of Gujarat has been completed and Process package submitted to JR.
 - Package for novel liquid phase ATF hydro treatment process developed by IOCL R&D in June 2010.
 - Revamp of Naphtha Splitter Unit of MRPL, Mangalore.
 - Revised AU-5 revamp Process package for Gujarat Refinery (from 3.0 – 7.3 MMTPA) submitted in December, 2010.
 - Revamp package for Energy optimization of Vacuum Distillation Unit-I at Haldia Refinery sent to HR in January. 2011.
 - Revamp process package for Fuel Gas Amine Absorption unit at Haldia Refinery including civil / mechanical adequacy check of existing equipments and foundations, design of new absorber column foundation was prepared and submitted to Haldia Refinery in Feb'2011.
- Engineering & Mechanical designing

- Mechanical Design of Main Fractionator and Sponge absorber for DCU of Guwahati Refinery completed and submitted to GR in December 2010.
- Detailed Engineering for CDU-1 pre-heat improvement project of Bongaigaon Refinery has been completed in March 2011. This includes engineering design of Mechanical / Civil / Electrical / Piping for the proposed modifications.
- New designs developed and implemented.

4 New Grass root units designed by PDEC commissioned in Gujarat Refinery during the period June-September 2010. These include Amine Regenerator Unit having the largest Capacity in IOCL, 2 nos. Sour Water Units & CLPS gas absorber.
- Presentation of Technical Paper:

PDEC's design for RFO reduction in DCU was presented in International Refining conference at Rome, Italy instituted by Gulf Publishing Company, publisher of Hydrocarbon Processing Journal in June'10. This design was well appreciated by experts attending the conference.

OPTIMISED VOYAGES:

- SHIPPING
 - ❖ To reduce freight cost, about 90% lifting of imported crude oil volume for IOC was done through VLCCs which is highest ever achieved.
 - ❖ Co-loading of Suezmax parcels ex Arabian Gulf with Suezmax parcels of BPCL in a VLCC was done twice resulting in freight saving of about Rs. 80 Lakhs in each case. Similar arrangements with other oil companies are being explored.
 - ❖ New Ship vetting procedure introduced w.e.f 1st July'10 for the vessels being chartered by IOC for import of Crude Oil. Accordingly, all vessels now must have at least one Ship Inspection Report (SIRE) on the date of enquiry and for vessels more than 15 years old. The SIRE should not be more than 6 months old.
 - ❖ During the period of Paradip SBM outage in the month of August '10, lighterage at Kakinada was commenced within shortest possible time of 5 days with existing daughter vessels and 4 additional Aframax vessels on Time Charter basis.
 - ❖ For the first time, a Shipping Manual containing all aspects of shipping activities has been published.

GREEN TECHNOLOGIES

- Clean Development Mechanism (CDM) Project:
 - CDM project at Guwahati Refinery, "Flare Gas Recovery System" with a Carbon Emission Reduction (CER) potential of 2973/ Annum, was registered under UNFCCC on October 27, 2010. With this the total CER of registered CDM projects (5 Nos) in Refineries Division has gone up to 60000 CER per annum.
 - Host Country approval received from MOEF on 14.03.11 for CDM Project at Mathura "Idling of feed furnace during normal operation of DHDT unit" at MR.
 - CDM project at Barauni Refinery, "Flare Gas Recovery System", was webhosted in UNFCCC website on November 20, 2010. Verification of the project by M/s TUV India Ltd. is in progress. Issue of CER (about 6300) by UNFCCC is expected by July, 2011.

- CDM project at Digboi Refinery, “AVU Energy Optimisation” was webhosted in UNFCCC website on March 1, 2011. Verification of the project by M/s TUV India Ltd. is in progress. Issue of CER (about 4900) by UNFCCC is expected by September, 2011.

SHAPING BRIGHTER TOMORROW:

SYSTEM IMPROVEMENT

- Migration of Control system from Mark IV to Mark VI in GTs of Gujarat Refinery done successfully.
- Inspection Management System (IMS) fully integrated with PM module of SAP implemented for the first time at Mathura Refinery.
- **S-Wrap** Technology for online sealing was successfully tested for CW Line leakage arrest in AU-II of Gujarat Refinery. The Major advantages of this system are: permanent repair, can be installed in confined and congested work area and conforms to complex geometries.
- New radiography technique “SAFERAD” employing compact shielding collimator with “Se-75” source was deployed in Panipat P-15 revamp shut down for the first time in IOCL refineries. This method requires very less cordon-off area due to low energy source and radiography can be carried out simultaneously at multiple locations without evacuation of people. The technique shall be useful in shutdowns as well as projects where large manpower is deployed.
- **e-Suggestion Scheme in all Units/RHQ:** Submission of suggestions has been made easy and on-line by the e-Suggestion portal which was implemented centrally through the RHQ server and can be accessed by the entire refineries division.
 - ❖ System flow has been made uniform and common across the entire division.
 - ❖ Centralized database to provide better archiving and accessibility.
- **Enhanced and Reliable MPLS (Multi-Protocol Label Switching) Connectivity with other Indian Oil Locations**

Bandwidth increased from 4 MB to 8 MB at SCOPE and 4 Mb to 12 MB at CO to provide congestion- free connectivity.

 - ❖ The circuit is terminated at our premises on fiber connectivity for better stability.
 - ❖ Direct backbone to BSNL to remove the hop of MTNL for better integration.

CUTTING EDGE TECHNOLOGIES ADOPTED

- Step-less Control System for HCU Make Up Gas compressors at Gujarat

Gujarat Refinery implemented Step-less Control System in Makeup Gas compressors of HCU in Oct'10. Installation of this system is expected to result in a power saving of 2000 SRFT/Yr.
- Installation of magnetic resonators in GTs at Gujarat, Mathura, Haldia and Bongaigaon

Magnetic resonators were installed and commissioned in GTs of Gujarat, Mathura, Haldia and Bongaigaon Refineries which resulted in increase in combustion efficiency and saving in energy to the extent of 3350 SRFT/year.

- Implementation of new KPI based methodology for APC benefit assessment across IOCL refineries

A New KPI based Methodology of APC Benefit assessment based on controller-wise, variable-wise on-stream factors and average values of controlled variables was devised jointly by IOCL and M/s HAIL in Apr' 10. Accordingly, KPI based templates have been developed for all existing APC controllers across IOCL and are being used for monitoring APC benefit on regular basis.

- Developments in APC/ Automation

At Gujarat, RTDB hardware upgradation project comprising of upgradation of LCN to 6XX series and the upgradation of obsolete PLNM modules to APPNODE was completed in Oct'10.

Model based multi-variable APC implemented in HGU/HDT units of Digboi, Hydrocracker unit of Gujarat Refinery in June'10 and Dec'10 respectively. This will enable ease of operation and enhance profitability of the units.

GO-LIVE for Data Reconciliation & Yield Accounting (DRYA) under Phase II of Refinery Information System (RIS) implemented at BGR in June'10.

PROFITABLE PURSUITS

- Widening of Crude Basket

In order to widen the crude basket, following Crudes, were procured & processed for the first time in IOCL Refineries:

- ❖ Okono (Origin: Nigeria, API: 40.6, 'S':0.13 %wt): Processed at Gujarat, Mathura and Panipat in Sept /Oct'10. After successful processing Okono crude has been added to low sulphur regular basket for west coast refineries
- ❖ Hungo (Origin: Nigeria, API: 29.4, 'S':0.6 %wt): Processed at Haldia and Barauni in Aug/Sept'10.

Further 5 new Crudes were evaluated and included for Trial processing:

- ❖ COCO (origin: Congo),
- ❖ Rabi Blend (origin: Gabon),
- ❖ ESPO (origin: Russia),
- ❖ Champion Export (Origin: Brunei)
- ❖ Jubilee Blend (origin: Ghana)

With this IOC crude basket now consists of 15 regular HS, 34 regular LS and 56 trial crudes.

- Absorption of Rajasthan Crude at IOCL Refineries

Processing of Mangla crude produced by M/S Cairn Energy India Pty Ltd from RJ-ON-09/1 field started at Panipat refinery in July 2010 after commissioning of the heated and insulated pipeline from Barmer and associated facilities for injection into MPPL at Radhanpur. The rate of injection gradually increased to 10% in regular HS crude from 1st week of Aug'10 onwards. The facilities for injection of Mangla crude into V-K section of SMPL and for processing at Gujarat Refinery are expected to be completed by May'11. With this, around 1.5 MMTPA of Rajasthan crude is expected to be absorbed in IOCL Refineries.

- COSA with ONGC

A crude oil and sale agreement (COSA) between IOC & ONGC was finalized after several meetings. The COSA was initiated on 25.05.2010 by IOC & ONGC and approvals were obtained from the respective Boards. The COSA has been made effective from 01.04.2010.

APPLAUSE & ACCOLADES- RECOGNITION OF OUR EFFORTS:

- PETROTECH Special Technical Awards:

- ☞ Indian Oil won the PETROTECH Special Technical Awards in two categories – Project Management (Team) and Innovation (Individual).

- Indian Oil's world-scale **Naphtha Cracker Project** at Panipat was the joint winner of the **Project Management Award 2010**. An apt manifestation of Indian Oil's superior project management skills, the Naphtha Cracker project was executed and commissioned in a record time of 46 months and compares well with the global benchmarks for similar capacity cracker projects.

- In the **Innovation category**, the award was presented to Mr. Ashis Nag, GM (PDEC) and Mr. Mukesh Kumar Sharma, Dy. Manager, Process (PDEC) Design Engineering Group of Indian Oil's Refineries Division for jointly developing an intrinsically safe and novel eco-friendly technological solution, named "Super Sour" technology. By using this technology, more H₂S can be recovered from the existing Sour water stripper unit.

The first grass root unit of this "**Super Sour**" novel configuration has been successfully put into the operation in year 2010, at Gujarat Refinery of Indian Oil.

- National Energy Conservation award - 2010 from Ministry of Power:

- ☞ Digboi & Barauni refineries selected for the 'Certificate of Merit' in the Refinery Sector for the National Energy Conservation Awards – 2010. Evaluation of award was based on percentage reduction in Specific Thermal Energy Consumption (Million Kcal / MT of product) in 2009-10 over 2008-09. These awards were presented during National Energy Conservation Day (December 14, 2010).

- Jawaharlal Nehru Centenary Awards for energy performance

Jawaharlal Nehru Centenary Awards for Energy performance of Refineries for the assessment year 2009-10 were won by Panipat & Bongaigaon Refineries.

The awards are conferred to Indian Refineries for achieving minimum Specific Energy Consumption measured in terms of Thousand BTU / BBL of crude processed / NRGF during the year. Following IOCL refineries have bagged the awards:

Group-1: Refineries having composite energy factor > 5

First Prize: Panipat

Group-2: Refineries having composite energy factor ≤ 5

Second Prize: Bongaigaon

- Oil & Gas Conservation Fortnight (OGCF) – 2009 Awards

Four IOCL Refineries viz. Mathura, Panipat, Barauni, Haldia have also bagged Oil & Gas Conservation Fortnight (OGCF)– 2010 award based on the annual survey conducted by Centre for High technology.

- ☞ The awards are presented to Indian Refineries based on the performance during the survey conducted every year during OGCF. In 2010, survey was conducted in all

Category-1: Furnace/Boiler Insulation Effectiveness

Group-1: Total Design Heat Duty > 500 MMKcal/Hr

First Prize: Mathura
Second Prize: Panipat

Group-2: Total Design Heat Duty ≤ 500 MMKcal/Hr

First Prize: Barauni

Category-2: Furnace/Boiler Efficiency

Group-1: Total Design Heat Duty > 500 MMKcal/Hr

Second Prize: Mathura

Group-2: Total Design Heat Duty ≤ 500 MMKcal/Hr

Second Prize: Haldia

- Sri Anil Raj trophy for achieving maximum reduction in Energy consumption and hydrocarbon loss
 - ☞ Guwahati Refinery was awarded “Sri Anil Raj trophy” for the year 2009-10 for second consecutive year for achieving maximum reduction in energy consumption (around 11%) and hydrocarbon loss amongst IOCL refineries over the previous best performance.

SAFETY & ENVIRONMENTAL MANAGEMENT

- Mathura Refinery bagged International safety award from British Safety Council
 - ☞ Mathura Refinery won the coveted International Safety Award – 2009, instituted by the British Safety Council (BSC), London, UK for achieving excellence in the management of health, safety and environmental (HSE). This is the second consecutive award for the refinery.
- Oil Industry Safety Directorate Award 2009-10 for Safety Performance (Refinery Category)
 - ☞ Panipat Refinery bagged First position and Mathura Refinery bagged the Second position for safety performance for the year 2009-10.
- Shri AV Ogale Shield for safety in operations for 2009-10
 - ☞ In recognition of its excellent performance in the field of fire prevention and safety, Mathura Refinery was honoured with Shri A.V.Ogale running shield for the year 2009-10.
- Golden Peacock Awards for OH&S (Instituted by Institute of Director)
 - ☞ Haldia Refinery was conferred with the “Special Commendation Certificate” of the 'Golden Peacock Award for Occupational Health and Safety for the year 2010.
- National Safety Awards (instituted by ministry of Labour and Employment-Govt. of India) for Bongaigaon, Mathura and Guwahati Refineries under “Manufacture of Coke & Petroleum Products”

☞ **Bongaigaon** Refinery was the winner of two prestigious 'National Safety Awards' of the Ministry of Labour & Employment, Government of India under **Scheme-I** (Lowest Average Accident Frequency Rate) for the fifth consecutive year and **Scheme-II** (Largest Accident Free period) for sixth consecutive year where as **Guwahati and Mathura** Refineries were Runners up under **Scheme-I and Scheme-II** respectively.

- **Safety Awards-2009:**

☞ Three of our Refineries received safety awards from National Safety Council of India, for the manufacturing Sector.

Bongaigaon: Shreshtha Suraksha Puraskar (Silver Trophy)

Guwahati :Suraksha Puraskar (Bronze Trophy) for the second consecutive year.
Panipat : Prashansa Patra.

☞ In recognition of excellence in Safety Management System and Occupational Health in Project construction, Panipat Naphtha Cracker Project, was conferred the prestigious national level National safety Council of India (NSCI) Safety Awards- 'Shreshtha Suraksha Puraskar' in the construction sector for the year 2009.

- **Bongaigaon Refinery bestowed National Award for Prevention of Pollution”**

☞ Bongaigaon Refinery received the “National Award for Prevention of Pollution” for the year 2008-09 under Oil Refinery category from Ministry of Environment & Forest, Govt. of India on September 16, 2010.

- **Greentech Environment Excellence Award in Petroleum Sector (By Greentech Foundation)**

☞ Gujarat, Mathura, Bongaigaon, Haldia and Digboi Refineries have been declared as **Winners of Greentech Environment Excellence Award-2010 in the Gold category** in Petroleum Refining sector by Greentech Foundation, New Delhi

OTHER AWARDS

- **Rajbhasha Samman Shield**

☞ Panipat Refinery won the First Prize and Guwahati won the Second Prize for ‘Hindi Implementation’ for the year 2008-09

- **Rajbhasha Millenium Shield for Panipat**

☞ In recognition of its brilliant performance in the field of Official Language Implementation, Panipat and Bongaigaon Refineries have been conferred the prestigious Millennium National *Rajbhasha* Shield. During the same function, Bongaigaon Refinery was also felicitated with the 'Millennium *Rashtriya Rajbhasha* Shield Samman-2010'.

- **TPM Excellence Award:**

IOC refineries have continued their stellar performance in the area of TPM during this year also.

Haldia Refinery was accredited with TPM excellence award in Jan'11 and Barauni Refinery cleared the Pre-health Check-up, which is prerequisite for assessment for the ‘TPM Sustenance Award’.

Barauni Refinery also has won “Kaizen award” under “Supervisor/Manger’ category and Guwahati Refinery (jointly with R&D) won the award in Senior Management category at Kaizen Conference Cum Competition organized by TPM Club of India.

Office TPM has also been initiated at Refinery Head quarters to enhance performance.

Other refineries are targeting for the TPM excellence award by 2012.

CORPORATE AWARD

A Suggestion Scheme to harness creativity and innovation for higher productivity among the employees is in vogue in the corporation where in the deserving employees are rewarded every year. Recently submitting suggestions has been made easy and on-line by the e-Suggestion portal which has been implemented centrally through the RHQ server and can be accessed by the whole Refineries Division. The Suggestion Scheme Corporate Awards for the year 2009-10 were distributed during 50th Indian Oil day celebrations on 01.09.10.

- **The Best Suggestion** of the year Award was won by Mathura Refinery
- **The Best Suggestor** Award was won by Guwahati Refinery.
- **The Most Frequent Suggestor** Award was won by Barauni Refinery
- **The Best Co-ordinator** Award was won by Barauni Refinery

REFINERY-WISE HIGHLIGHTS:

GUWAHATI

MAJOR ACHIEVEMENTS:

- Refinery has achieved 1486 fire free Days as on 31.03.11 (last major fire occurred on 06.03.2007) and 294 last time accident free days(since 10.06.2010) as on 31.03.11
- First batch of BS-III HSD from Guwahati Refinery was dispatched on 12.04.2010 through Guwahati-Siliguri Pipeline.
- Successfully produced first batch of BS-III MS through Alkylate blending with INDMAX Gasoline/light Naphtha and dispatch to Betkuchi commenced w. e. f. 12th Aug’10.
- Highest ever DCU run length of 623 days (from 11.04.09 to 25th Dec’10) achieved against previous best of 386 days in 2008-09.
- PGTR of new HDT Catalyst carried out with representatives of M/s Albermarle, catalyst vendor from 16th to 17th Apr’10. Sulfur content and Delta Cetane no. improvement of the neat product stream met the guarantee.
- Unloading facility of Cetane Improver from bulk truck to batch tank B-4 (200 KL capacity) and for dosing to HSD finished tanks was provided since Jun’10. Resulting in savings in transportation and handling cost of Cetane improver drums.
- CDU preheat improvement by interchanging S-11C from cold section to hot section implemented and commissioned on 20th Aug’10. Benefit: Preheat improved from 252 deg C to 266 deg C with fuel saving of approx 3 MT/day achieved in CDU.

- Scheme for pre heating of DM water by CDU Main Column overhead vapour heat implemented in Sep'10. Benefit: Heating of DM water from 31 deg C to 70 deg C resulting in reduction of 4.5 MT/hr LP steam to de-aerator and equivalent fuel saving of 1800 SRFT/ yr.
- Shri B N DEKA and Shri A SHARMA, Sr. Engineering Assistants –Electrical Maintenance, were felicitated “Shram Veer” award scheme of Assam Productivity Council in Aug'10.

BARAUNI

MAJOR ACHIEVEMENTS:

- Refinery has completed Accident free period of 553 days (since 23.09.2009) and Fire free period of 1752 days (since 13.06.2006) on 31.03.2011.
- Highest ever LPG production of 340 TMT achieved surpassing previous best of 294 TMT in 2009-10.
- Successfully produced first batch of BS-III MS by blending with Alkylate on 01.08.10 and dispatch started on 13.08.10 through BKPL.
- Successfully produced for the first time a trial batch (10 TMT) of BS-IV HSD on 18.11.2010 which was dispatched in BKPL the same day. BR also produced another 10 TMT BS-IV HSD in Dec'10.
- Naphtha stabilizer in DHDT commissioned on 29.08.10 and stabilized naphtha routed to BS-III MS stream instead of reprocessing in RFCCU.
- New MS tank- 255 commissioned on 03.06.10 and incorporated in SAP
- First Black Oil BTPN rake carrying CBFS was dispatched on 21.08.10 after in-house modification (1st phase) of gantry.
- Amine Treating Unit commissioned in Sep'10 for quality improvement w.r.t. 'S' in Fuel Gas.
- New Fire alarm management system commissioned in Oct'10.
- Dismantling of CCU stack completed in Aug'10. Dismantling and disposal of WHFU unit completed in Oct'10.

GUJARAT

MAJOR ACHIEVEMENTS

- Achieved fire free period of 2112 days (since 16th June 2005) and Accident Free Period of 579 days (since 28th Aug, 2009).
- Implementation of Euro specification products at Gujarat Refinery:
 - **BS-III MS:** 100% supply of since April'10.
 - **BS-IV MS:** produced on 29th July'10
 - ❖ Commencement of Supplies to Ahmedabad region through KAPL on 29th July'10
 - ❖ Dispatch of first batch by tank wagon on 06.08.10 for Cherapalli.
 - ❖ Commencement of Supplies to Hazira (Surat Region) through KDPL on 14.09.2010.

- **BS-III HSD:** 100% production since April'10 and dispatch from 05th April'10.
- **BS-IV HSD:** Part dispatches from 24.04.2010 with operation of DHDS unit.
 - ❖ First batch pumped in KAPL on 26th April'10
 - ❖ Dispatch of first batch by tank wagon on 07.10.2010 Cherapalli.
- **Pipeline compatible Kerosene (PCK) produced** and pumped in KAPL on 26.04.2010 for facilitating pumping of Euro-IV MS and HSD.
- PC Kerosene and Euro-III HSD pumping to KDPL commenced on 10.06.2010.
- First batch of Liquid Sulphur from new SRU under RUP dispatched on 22nd July, 2010.
- In order to meet PNCP naphtha requirement through rail, HSD header of Gantry no-6 was converted for Naphtha loading for Panipat on 11.01.2010. The first Naphtha rake was loaded on 15.04.2010.
- For the first time, Bunker FO-380 cst was produced and dispatched by TT for Adani-Mudra on 19.08.2010.
- First batch of PGH of PNCC quality dispatched to Panipat refinery by tank Truck 14th July'10.
- On-line cleaning of fire-side surfaces of FPU-II, FPU-1, AU-1, AU-II & AU-V furnaces carried out for achieving higher throughput and fuel saving.
- Emergency Solar Lighting at Refinery Main Gate installed as an alternate provision of lighting during Power Failure.
- To recover hydrogen from CRU off gas going to fuel gas header, a modification was done at Gujarat Refinery to divert off gas to MSQ net gas compressor at 2nd stage suction. About 5000 nm³/hr hydrogen is being recovered.
- **Automatic Ultrasonic Testing:** In RUP project for high thickness pipes, Automatic Ultrasonic Testing was carried out in place of normal high strength Radiography source to avoid cordoning off the area and stoppage of other human activity. This has resulted in saving in project execution time.
- **Commissioning of 2 Nos. Air Compressors of 5500 NM³/hr capacity** with Air Driers for catering to Instrument & Plant Air requirements of new Units under RUP.
- Introduced New Digital Video Recording facility at main gate & gate no-10 by utilizing the existing setup of the cameras and its image multiplexing system. This has greatly enhanced the effectiveness of the surveillance camera systems. The digital system has facility to capture and record data for 60 days at a stretch.

HALDIA

MAJOR ACHIEVEMENTS

- Achieved Fire free operation period of 1180 days (since 5.01.2008) and 366 (since 30.03.10) accident free days on 31.03.2011.
- CDU-I Trim Furnace commissioned in Dec'10. This helps Refinery to enhance reliability and reduce load on main furnace resulting in increased run length.
- Highest ever LOBS production of 29 TMT in Feb'11 as compared to 27.5 TMT in Nov 2010

- First time ATF produced and certified from OHCU in admixture with KHDS run down (30:70 ratio by volume) on 24.02.2011.
- Maiden Group-II LOBS ex CDWU was produced in Feb'11 with OHCU bottom in admixture with raffinate. This is close to Group-III LOBS.
- SRU-IV was commissioned with Train-1 on 27th September 2010. Train-2 commissioned on 22nd November 2010.
- Installation of economizer coil in VBU furnace completed in June'10.
- Facility for taking OHCU Heavy naphtha as feed component for CRU was completed on 29.05.2010. This will enhance the feed availability to CRU.
- Facility for routing Un-Converted Oil stream ex OHCU to Raffinate tanks for processing in CDWU unit was: Completed: 28.12.2010.
- Metallic Loading Arms installed in 4 Nos of LPG Loading Bay in Sept '10 which will result in enhanced safety and reliability and reduction of LPG loss through Flaring.
- Microprocessor Based Integrated Fire Alarm system commissioned on 19th April-2010
- New Foam Tender fabricated on VOLVO FM9 6X4 chassis put in service from June, 2010
- The health assessment of critical offsite piping at difficult to approach locations like under culverts, at dykes or road crossing was carried out by online advanced NDT known as LRUT (Long Range Ultrasonic Testing) for the first time. This method of inspection was found very effective in detecting deterioration of pipes under unapproachable culverts/ road crossing/ dyke areas.
- Installation of magnetic Resonators in GT-I & GT-II for reduction of fuel consumption was completed in October'10.
- Automatic fuel changeover in GT-2 and GT-3 was commissioned for safety and stability of the system.

MATHURA

MAJOR ACHIEVEMENTS

- Achieved fire free operation period of 1918 days (since 29th Dec 2005) and Accident Free Period of 112 days (Last accident occurred on 09.12.10) till 31.03.11.
- Total dispatches of MS and HSD ex refinery switched over from BS-II/BS-III to BS-III/BS-IV grade w.e.f. 1st & 7th April 2010 respectively.
- Highest ever ATF production of 880 TMT achieved during the year surpassing the previous best of 716 TMT in 2006-07. Also highest ever monthly production of 84.6 TMT in Dec'10 surpassing the previous best of 79.6 TMT achieved in Oct'09
- First batch of PNCP naphtha with paraffin content of 68.8 wt% was dispatched through Bijwasan Panipat Pipeline (BPPL) to Panipat on 24th Apr'10 and largest parcel of 14 TKL was pumped on 06th Sep'10.

- BS-IV Grade MS 93 successfully produced and dispatched to Marketing in Oct'10 for the first time.
- NSU revamp was executed during Jul/Aug-10 CCRU S/D and successfully commissioned on 22nd Aug'10. Post NSU revamp, the total naphtha spill ex AVU is made zero and equivalent quantity of naphtha is upgraded to MS component after treating the same in NSU/CCRU and MSQ units.
- Fourth chain of existing DM plant of 120 m³/hr capacity was developed using existing redundant vessels based on in-house knowledge and successfully commissioned in Jun'10. This plant is designed for processing of either ETP-RO permeate or other RO permeate. This facility was especially helpful for ensuring continuous supply of DM water for process needs & also to maintain the sufficient stock in DM water tanks.
- Verification of Green House gas (GHG) accounting data completed by M/s. BVC (India) on 19.03.11. Mathura refinery is planning for ISO 14064 verification certificate by end Mar'11.
- As a part of reliability improvement measures, Outer Johnson Screens in CCRU reactors were replaced with Scallop during Jun-July, 2010 shutdown. This is as per recommendations of Licensor M/s Axens.

Further Health assessment of Centre pipe Johnson screen (inner screen) in CCRU reactors- R-1, R-2 and R-3 was successfully carried out for the 1st time in IOC in Aug'10 using specialized NDT technique by a joint team of M/S NML, Jamshedpur, IOC R&D and MR inspection department.

- Magnetic Resonators installed in GT-I & GT-II during June'2010 and savings achieved to the tune of 600 SRFT/Year. Installation in GT-III was completed earlier in Jan.'2010.
- First ever Isomerase/Reformat rake dispatched to Barauni Refinery on 12th Sep'10 to facilitate BS-III MS production by Barauni Refinery..
- Upgradation of Tank Wagon Loading DCS System completed on 30.09.10 with incorporation of following additional facilities in the upgraded system:
 - ❖ Topping up of T/W in any cluster while loading in progress in other clusters.
 - ❖ T/W loading timer to monitor loading performance.
 - ❖ Single shot DCS data clearing button
- Three nos of Ultrasonic based Biomass Reduction Devices are successfully installed in fresh water open reservoirs at Water Block for controlling Algae & bacterial growth on 09th Sep'10. This has helped in reduction of fresh growth of Organic Matter in reservoir from the level of 50 to 10%.
- 12 nos. Auto Water Drain Valves (AWDV) successfully installed & commissioned in Naphtha and MS tanks in Dec.'2010 for reduction of loss as well as slop generation. Further, 34 nos. of AWDVs in SKO, HSD, intermediate Naphtha feed tanks and slop tanks are under procurement.

DIGBOI

MAJOR ACHIEVEMENTS

- During the year refinery operated without any lost time accidents and Fire incidents. Refinery achieved 390 days of accident free operation days up to 31.03.2011(last accident on 24.02.10) and 657 days of fire incident free operation days up to 31.03.2011(last fire incident on 14.05.09).
- First batch of BS-III HSD ex DR was pumped from New Tank Farm, Digboi to Tinsukia on 1st April'10 and as per requirement BS-III HSD production started on a sustained basis from May'10 at DR.
- BS III MS production commenced with the input of blending components supplied from MR & PR and first batch dispatched to Tinsukia Terminal on 3rd Aug'10.
- An agreement was entered into for Sale and Purchase of 5 MW of surplus Electrical Power from Digboi Refinery to the Digboi Sub-station of APDCL (Assam Power Development Corporation Ltd.) on 13.02.2011.
- Double chambered biomedical waste incinerator installed and commissioned at Digboi Hospital to meet the requirements under the Biomedical Wastes Act
- The eco-friendly Valve Regulated Lead Acid (VRLA) type SMF battery system with inbuilt battery charger introduced successfully for emergency DG sets by replacing the 25 plate 12V lead acid battery units. This has eliminated the regular battery maintenance jobs
- Condensate recovery from Steam Trap Stations and its reuse in process plants in two phases ie in Phase -I for Fuel Sector comprising AVU, DCU, CRU and in Phase - II for HDT block was completed and successfully commissioned.
- Digboi Refinery LAB was accredited with ISO/ IEC 17025 : 2005 by NABL with effect from 30/01/10.
- Total 30 nos. solar street lights installation and commissioning completed.

PANIPAT

MAJOR ACHIEVEMENTS

- Achieved fire free operation period of 1919 days (since 28.12.2005) and Accident Free Period of 497 days (since 20.11.2009) as on 31.03.11.
- Highest ever production of 562 TMT of LPG and 838 TMT ATF achieved during the year against previous best of 509 TMT (2009-10) and 717 TMT (2009-10) respectively.
- Bijwasan–Panipat Pipeline (BPPL) dedicated for Naphtha Transportation was commissioned on 24th April, 2010.This will facilitate regular movement of Naphtha from Mathura to Panipat at reduced cost.
- Two new LPG mounded bullets having capacity 2873 M3 each commissioned on 26th Aug'10.
- Dedicated line for pumping PCK in pipeline for transportation of BS-IV fuel commissioned on 24th Aug'10
- 35 TKL batch of ATF (largest so far) from Panipat to Bijwasan was pumped on 21st/22nd Dec'10.
- As a part of energy conservation measures the following schemes implemented.
 - ❖ Conventional gas AC compressors system was replaced with Vapour Absorption Machine (VAM) in central AC Systems of PR/PRE control rooms and Admn. Building. Surplus LP steam (6 MT/hr) from PREP HGU is being used in VAM of AC systems.
 - ❖ Implementation of Solar heating system in 6 quarters in Refinery Township.
- Revamp of side cut naphtha circuit in Naphtha Splitter Unit of AVU-1 was done during revamp shut down to cater increased feed processing post P15 to sustain simultaneous production of PX feed and MSQ feed.

- Scheme implemented for routing off spec Diesel and Kerosene ex OHCU during start up and shut down to DHDT feed tank instead of slop tanks to reduce slop generation.
- To improve heating cycle of offline DCU coke chamber, 6" vapor line from condensate drum (V-101) to fractionator was replaced by 14" line. This measure resulted in not only reducing warm up time but also lower coke yield.
- Installation of on-line Corrosion probe in AVU-I Fractionator Overhead Circuit : On line CEION type corrosion probes with facility of corrosion rate display in DCS have been installed in AVU-I Fractionator Overhead Circuit. For the first time, this type of advanced corrosion monitoring system is installed in any IOCL refinery.

Panipat naphtha Cracker Complex

- To add value to the product, processing of Propylene ex FCCU in NCU started from Dec'10.
- 268 TMT of Polymer, 147 TMT of MEG, 44 TMT of Benzene produced during the year.
- To reduce fuel cost RLNG taken in the complex for use in power and steam generation from 9th Aug'10.
- 100% capacity achieved in PP Unit with six grades and PGTR was completed with five grades (2 in Line-1 and 3 in line-2). Total nine grades of polymers produced during the year
- 100 % capacity achieved in Swing unit on 7th Feb'11 with Film (010F18S/A, Raffia (010E52) and Injection Molding (080M60) grades and PGTR completed with raffia grade. Total seven grades of polymers produced during the year.
- 100 % capacity achieved in HDPE unit with Film (002DF50), GBPM (012DB 54) and Pipe - PE-80(004DP44) grades and PGTR completed with all these grades. Total ten grades of polymers produced during the year.
- 100% capacity achieved in MEG (Mono Ethylene Glycol) unit on 21st July'10 and PGTR completed. MEG Unit has produced 147 TMT of MEG, 10.5 TMT of DEG during the year.

BONGAIGAON

MAJOR ACHIEVEMENTS:

- BGR achieved highest ever accident free days of 3323 (since 24.02.2002) and highest fire free days of 1970 days (since 08.11.2005) till 31.03.11.
- The first batch of BS-III MS was certified on April 13, 2010 & the 1st BS-III MS rake of BGR was flagged off on 22.04.10 to Siliguri Terminal.
- The 1st batch of BS-III HSD was certified on 18.04.2010 & the 1st BS-III HSD batch of BGR was dispatched to New Jalpaiguri by GSPL on 30.04.10. The 1st batch of BS-III HSD through BTPN rake was loaded for Malda on 23.05.10.
- Biometric Access Control System has been implemented in BGR effective from 08.10.2010 for exit/entry of employees and others to Refinery premises.
- CFO Stripper in DCU-II/I were commissioned successfully on 16.06.10/04.02.11 respectively. This was carried out to reduce CFO yield & increase the recovery of Gas oil components in DCU.
- RTDBMS has been commissioned in TPS in Apr '10

- 278 MTPD CFC (Continuous Film Contactor) Unit was installed and commissioned in Mar'11 to improve LPG quality by removal of H₂S and Mercaptans from LPG streams from CDU and DCU.
- New Fire Alarm system integrated with FA systems located in different units and substations and offices has been installed to replace the old-system
- Provident Fund successfully transferred from BRPL PF trust to IOCL PF trust for transferred employees. and Gratuity Fund Trust" has been merged with "IOCL Employees Group Gratuity Trust".
- First time Low Frequency Electromagnetic Technique (LFET) was been applied to scan Bottom plate of Tank -1909 in HSD service.
- 5 no. of solar heating systems have been commissioned during the year as part of ENCON initiatives.

GENERAL

- Long Term Settlement on Pay and Pay related issues for workmen due for revision w.e.f. 01.01.2007 was signed on 29th July 2010 at Surajkund Faridabad after protracted discussion with the recognized Unions of Refineries Division (incl. AOD), Pipelines Division and R&D Centre. The Settlement is effective for 10 years.
- During the year, 7 Quality Control Officers, 6 Medical Officers and 12 Boiler Engineers joined. Recruitment exercise for recruitment of 50 Officers in HR, Corporate Communications and Fire & Safety disciplines initiated in November, 2010. Written test for HR and Corporate Communications disciplines completed in Jan'11. Further selection process would be completed by Corporate Office.
- 150 Nos. of 150 W street lights were replaced with 14 watt LED fittings in Noida township resulting in reduction in power consumption.
- Merger of IBP and BRPL SABF Trust with IOCL SABF Trust approved by the respective Trusts. The merger activities have been completed
- **Launch of Disciplinary and Vigilance Action Software – DiVAS:**

A centralized customized web based application software, DiVAS (Disciplinary and Vigilance Action Software) with Single user 'write' permission and Multi-user 'read facility' prepared by HR and IS Dept of Ref. Hqrs. was launched on 1st September 2010 at Refineries Hqrs for availability of real time data and for monitoring of Disciplinary cases both Vigilance/Non-Vigilance in nature.

All figures are provisional.