INDIAN OIL CORPORATION LIMITED
(Panipat Refinery)

Sub: Panipat Refinery Capacity Expansion from 15.0 to 25.0 MMTPA

1.0 INTRODUCTION:

1.1 Panipat Refinery (PR) was commissioned in 1997-98 with crude oil processing capacity of 6.0 MMTPA. The refinery capacity was raised in 2006-07 to 12.0 MMTPA with the addition of another crude unit and a full conversion hydrocracker as the secondary processing unit and Delayed Coker unit for bottom up gradation (PREP- Panipat Refinery Expansion Project). Further through revamps and addition of process units the refining capacity has been brought to the present operating capacity of 15.0 MMTPA in 2010-11 (PRAEP- Panipat Refinery Additional Expansion Project).

1.2 Panipat Refinery is integrated with Aromatic Complex and Naphtha Cracker Complex. Aromatic complex consists of Paraxylene (PX) unit with production capacity of 360 KTPA & Purified Terephthalic Acid (PTA) unit with production capacity of 550 KTPA which were commissioned in 2006. Naphtha Cracker Complex with Ethylene production capacity of 857 KTPA was commissioned in 2010. At present revamping of PX, PTA is under implementation.

1.3 Motor Spirit Quality Upgradation project with Naphtha Hydrotreating unit (NHDT), Isomerization (ISOM), FCC Gasoline Desulphurization unit (Prime G) was commissioned in 2010 for production of BS-IV quality compliant MS.

1.4 At present Panipat Refinery is BS-IV compliant & GoI has issued Gazette notification on 16th Sep'2016 wherein it has proposed to supply BS-VI grade fuel in the entire country w.e.f. 1st April 2020 i.e. switching over from BS-IV grade fuels to BS-VI grade fuel. Accordingly, EIL was asked to make a configuration study for 100% BS VI auto fuels from existing 15 MMTPA Refinery. Stage-1 approval was accorded for production of BS-VI compliant products with crude processing capacity of 15 MMTPA. In order to produce BS-VI quality fuel, following units such as new DHDT (2.2 MMTPA), new HGU (44 KTPA), new SRU (225 TPD), new ARU (197 m3/hr), new SWS (57 m3/hr) and new TAME (36 KTPA) are envisaged in BS-VI project that are under implementation.

2.0 FACTORS FAVOURING CAPACITY EXPANSION AT PANIPAT REFINERY:

3.1 Panipat Refinery is strategically located to cater the increase in demand of Northern part of India as compared to meeting the demand by sourcing of products from Refineries situated in western part of India. Logistically, it will be more economical to cater the product demand from Panipat Refinery.

3.2 There is adequate land available for expansion of Panipat Refinery facilitating smooth execution of the expansion project.

3.3 There is wide network of Pipeline connectivity catering to large area and adequate facilities at Marketing Terminal to facilitate evacuation of products at minimal cost.

3.4 With availability of a large size Naphtha Cracker, there will be flexibility to meet its feed stock requirement without any disturbance resulting in sustained operation Refinery and Petrochemicals.

3.5 There is reliable availability of other associated infrastructure like water and power from the site.

3.6 Availability of other in-house infrastructure for refinery operation, storage & dispatch facilities of polymers at minimal cost.

3.7 In the above context a Feasibility study has been carried out to expand the Refinery from 15.0 to 25.0 MMTPA capacity with an objective to obtain viable configuration with economically acceptable MIRR.

3.0 CRUDE PIPELINE CAPACITY AUGMENTATION:

At present crude is being received from Mundra-Panipat Pipeline (MPPL) of capacity 8.4 MMTPA and Salaya Mathura Pipeline (SMPL) of capacity 7.3 MMTPA (Chaksu to Panipat). Further, a proposal to enhance Chaksu to Panipat section of SMPL pumping capacity from 7.3 to 19.1 MMTPA has been finalised by Pipeline Division. With this augmentation, total crude pumping capacity to Panipat Refinery will be 27.5 MMTPA.

A separate proposal for crude pipeline capacity augmentation is being put up by Pipelines Division.

4.0 PROJECT DETAILS

New process units and their capacities are given below.

4.1 **Atmospheric and Vacuum Distillation** unit: A new Atmospheric and Vacuum Distillation unit of 10.0 MMTPA capacity is considered for the capacity expansion.

4.2 **Diesel Hydrotreater (DHDT):** An additional Diesel Hydrotreater of capacity of 5000 TMTPA is being considered to upgrade diesel streams to BS-VI grade Diesel.

4.3 **VGO Hydrotreater (VGO-HDT):** A new VGO-HDT of capacity 3600 TMTPA is considered for hydrotreating SR VGO streams. The hydrotreated VGO will be processed in INDMAX unit which will facilitate higher production of Petrochemicals feed streams.

4.4 **Resid Hydrocracker (RHCU):** A new RHCU of 3300 TMTPA of 75% conversion is considered for Resid upgradation for conversion of vacuum residue to distillates. The unconverted bottoms of EBHCU (30%) will be processed in the existing Delayed Coker Unit.

4.5 **INDMAX**: A new INDMAX unit of 2500 TMTPA of low CCR feed (hydrotreated VGO) is proposed as a secondary processing unit which will facilitate maximization of petrochemicals feed streams. INDMAX LPG will be treated in CR LPG Treater unit and sent to Propylene Recovery unit.

4.6 **Naphtha Hydrotreater (NHT):** A new NHT of capacity 830 TMTPA is considered for hydrotreating full range naphtha. The hydrotreated naphtha stream is split in Naphtha Splitter unit (NSU) wherein light cut naphtha (C5-90°C) is sent to ISOM unit for processing and the bottom naphtha is sent to CCRU for processing.

4.7 **Isomerization unit (ISOM):** A new ISOM unit of capacity 201 TMTPA is considered for production of Isomerate which will facilitate dilution of Aromatics and reduce benzene content to meet BS-VI MS specification.

4.8 **Continuous Catalytic Reforming Unit (CCRU):** A new CCRU of 624 TMTPA capacity is considered for production of Reformate of RON 98.0.

4.9 **Hydrogen Generation unit (HGU):** A new HGU of capacity 84 TMTPA is required to meet hydrogen requirement of new process units i.e. RHCU, VGO Hydrotreater, DHDT, NHT and KHDS.

4.10 **Propylene Recovery Unit (PRU):** In order to recover propylene from INDMAX LPG, a Propylene recovery unit of capacity 1150 TMTPA is considered. The Propylene ex PRU unit is the feed stock for Polypropylene unit.

4.11 **Polypropylene Unit (PP):** A new Polypropylene unit of 450 TMTPA capacity is considered.

4.12 **Alkylation:** A new Alkylation unit block of capacity 670 TMTPA is considered for production of Alkylate for production of Premium MS of RON 95. Alkylate product has high RON value with nil olefin, nil aromatics and nil benzene content which will facilitate to meet BS-VI Premium MS specification.

4.13 **Sulphur Recovery unit**: Sulphur recovery unit of capacity 2*465 TPD, SWS (02 nos) of capacity of 344 TPH & 330 TPH, ARU of capacity 1350 TPH is required to match the incremental crude processing capacity. Sulphur pelletizer unit has been considered in Sulphur block.

4.14 **Petrochemical integration**: Due to the likely disruptive technologies foreseen in future and their expected impact on future fuels supply / demand scenario the refinery configuration has been evaluated for flexibility operation by Producing petrochemical feed stocks which can be used to make petrochemical in new downstream petrochemical units.

4.15 **CDW** (LOBs production) : Marketing (Lubes) has reviewed and confirmed that there is potential increase of lube market in the next 10 years and same will be uplifted from Panipat to minimize the gap between supply & demand of LOBS. In view of above, LOBS will be produced from CDW of capacity 560TMTPA.