



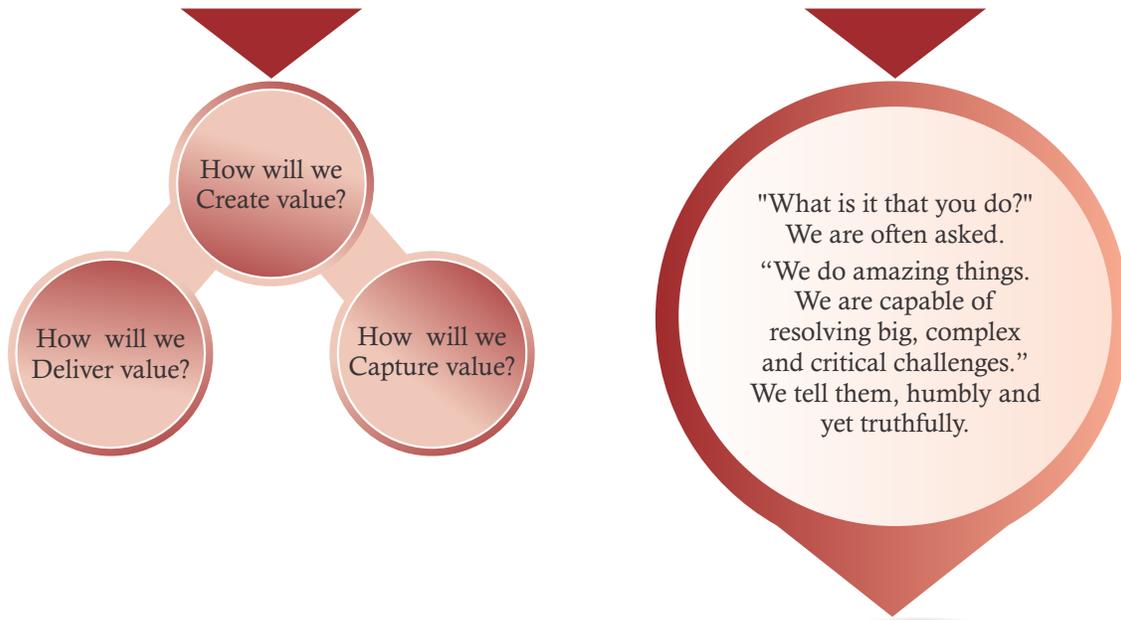
*Dynamic And Customer Focused
Technology Solutions Across
The Hydrocarbons Value Chain*



PROCESS
ENGINEERING



Engineers India Limited, Known for Technology & Process Solutions



Profile

Engineers India Ltd. (EIL) is a leading global engineering consultancy and EPC company. The Company has a diverse portfolio comprising Hydrocarbon, Chemicals & Fertilizers, Mining & Metallurgy, Infrastructure, Water and Waste Management, Solar & Nuclear Power sectors.

EIL has emerged as a 'Total Solutions' engineering consultancy company providing design, engineering, procurement, construction and integrated project management services from 'Concept to Commissioning' with highest quality and safety standards. It also provides specialist services such as heat and mass transfer equipment design, environmental engineering, specialist materials and maintenance and plant operations and safety services.

EIL has successfully completed all projects, all of which are operating smoothly (in most cases at more than rated capacity), and has, hence, created an array of satisfied clients. EIL has secured many repeat businesses from its clients which is a sign of client satisfaction, confidence and trust reposed in EIL.

EIL has earned the reputation of being a veritable treasure of technical knowledge, skills and professional competence. EIL has worked with almost all process licensors and a large number of engineering/ contracting companies worldwide and our engineers are well versed with international engineering codes and standards. With a workforce of over 3000 experienced employees & a variety of specialised services available under one roof, EIL offers an unique advantage to clients like none other.

5.6 million available Technical Manhours annually
9,600 available Construction Management and Supervision Man-months annually

GLOBAL PRESENCE

Geographical Regions	Key Countries served
Middle East	UAE Bahrain Kuwait Iran Oman Saudi Arabia Qatar Iraq
Asia / Asia Pacific	Australia Malaysia Indonesia Bangladesh Vietnam
Europe	Norway Turkey
Africa	Algeria Ghana Kenya Nigeria Angola Sudan Cameroon

TRACK RECORD

- 72 Major Refinery projects, including 10 grass root refineries,
- 9 Petrochemical complexes,
- 41 Oil and Gas Processing projects,
- 213 Offshore platforms including 40 process platforms,
- 46 Pipeline projects,
- 13 Ports, Storage & Terminals,
- 9 Fertilizer projects,
- 32 Mining and Metallurgy projects,
- 33 Infrastructure projects (airports, highways, bridges, water management, & energy-efficient intelligent" buildings),
- 23 Turnkey/EPC projects.
- Infrastructure Projects
- Power / Captive Power Projects



Key Strengths

More than 5 Decades of Project Execution Experience

- More than 5000 assignments including over 400 major projects worth USD 200 Billion in total cost.

Concept to Commissioning Capabilities

- Feasibility Studies, Licensing & Licensor Selection, FEED, PMC and EPC services
- Post Commissioning & Specialized services

Familiarization with Licensed Technologies

- Worked with most of the Licensors in the world across wide spectrum of technologies in O&G, Refining, Petchem, Fertilizers, Non Ferrous

Vast In-house Data Bank

- Knowledge archives of Past Projects
- Vendor, Contractor and Cost information

Value Engineering

- Strong Design capabilities, Exposure to alternative technologies
- Extensive data bank, vast experience in green field & revamp projects
- Feedback from operating plants.

Comprehensive Service Capability

- Multi-disciplinary expertise under one roof.

Experience Credentials & Global Presence



Overseas Clients

Middle East : ADNOC, ADMA OPCO, GASCO, TAKREER, ADCO, ZADCO, BOROUGE, BUNDUQ, NPCC, ADGAS, BANAGAS, BAPCO, ALBA, KNPC, EQUATE, PIC, NPC, ORPIC, SAUDI ARAMCO, SABIC

Asia : PETRONAS, WIKA, PAU, TPAO, BCIC

Africa : SONATRACH, BOST, KPRL, DANGOTE, INDORAMA, SONANGOL, SUDAPET, WNPOC, HYDROMINE GLOBAL MINERALS GMBH Ltd.

INDIA



INTERNATIONAL

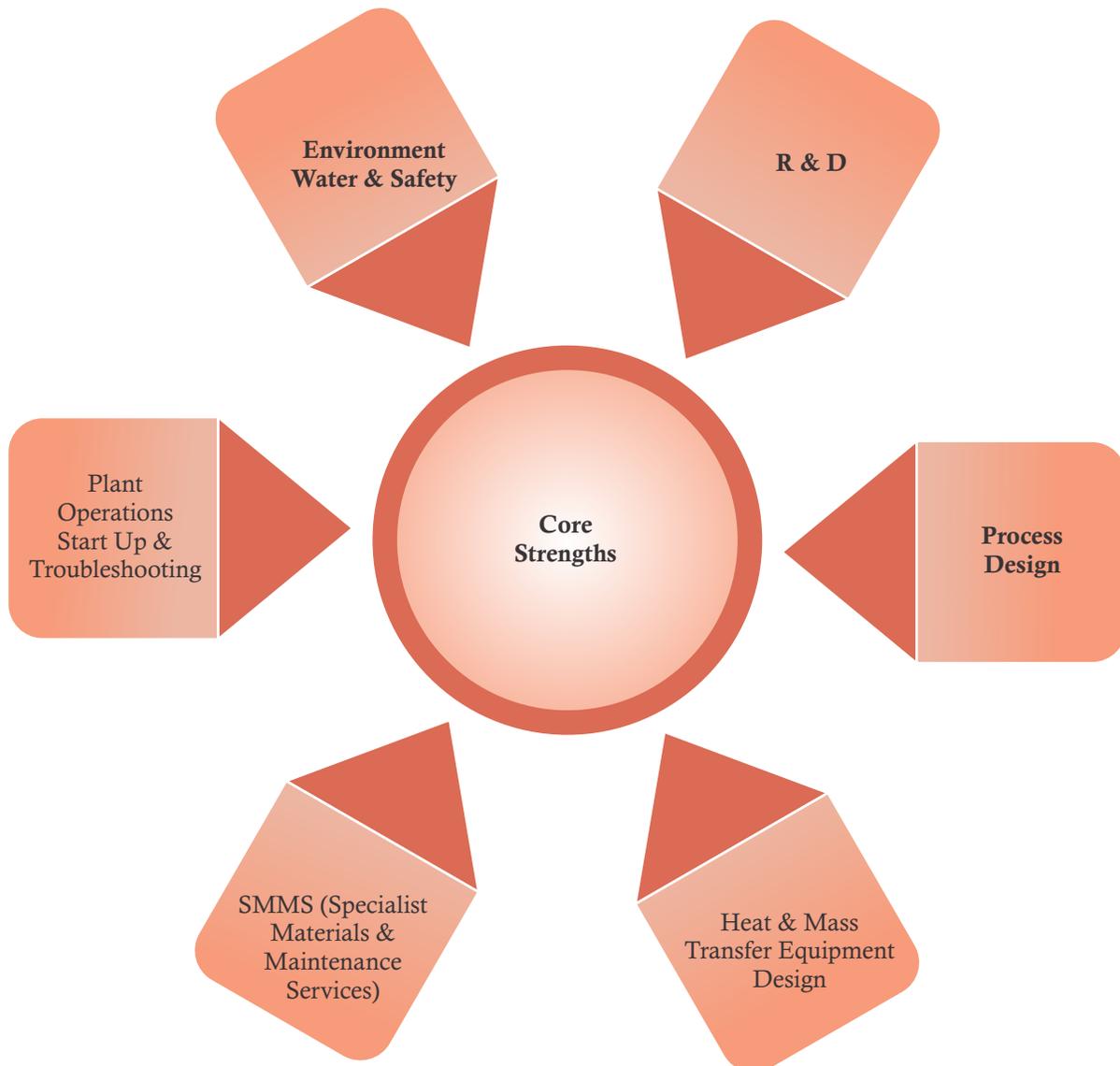




Delivering Excellence through our Technology

Engineers India Limited is a technology driven organization and has developed in-house technologies, which are successfully commercialised & are operating at various locations. EIL technology portfolio includes process technologies in refineries (both fuel & lubes block), gas processing, aromatics & product treatment. EIL is in a unique position to offer services for process

design as well as the design of Heat and Transfer equipment under one roof. These skills are further supplemented by the Plant Operations Start Up and safety, Specialist Materials and Maintenance Services and Environmental Engineering Services offered to clients.

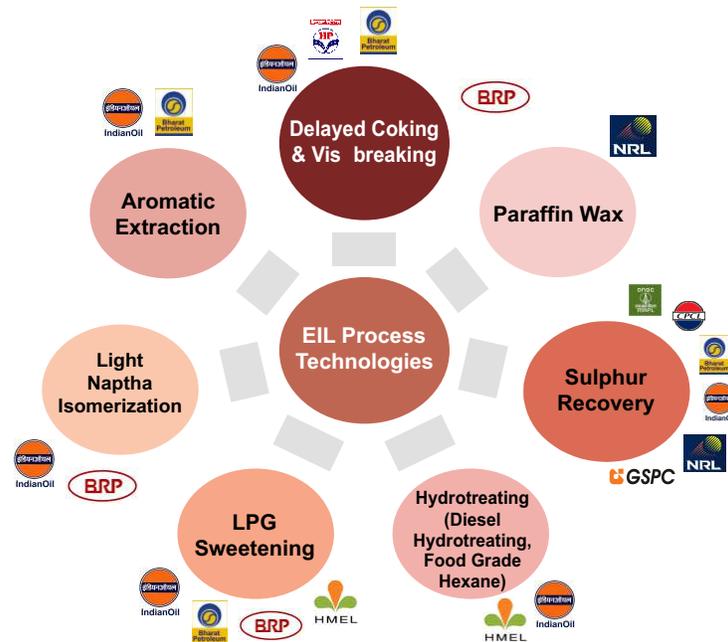


Our Research & Development

Engineers India Limited is a technology driven organization with deep commitment to pursue indigenous development of new technologies besides continuous updation of existing designs & technologies. Salient Features of R & D activities are:

<p>State of the art R & D Centre at Gurgaon (India)</p>	<p>Company holds 15 Patents while award of 14 patents is awaited</p>
<p>In house Development & Successful Commercialization of over 30 process technologies</p>	<p>Technology portfolio includes process technologies in refineries, gas processing & aromatics fields</p>

EIL have realized the need to have multifarious process design capabilities and taken the requisite steps to strengthen this capability by way of in- house Research & Development coupled with collaborative research with organizations like IOCL, CPCL, HPCL, IPCL, BPCL and National Laboratories like NCL Pune, Indian Institute of Petroleum Dehra Dun and academic institutions like Indian Institute of Technology Delhi, Kharagpur and Roorkee. The joint efforts of EIL & collaborating organizations have given a major boost to efforts towards indigenization of technologies & their implementation in various processing facilities. Continuous efforts to incorporate improvements in the various technologies through benchmarking exercises have helped to achieve reductions in operating and installed costs, so that these offerings present cost effective and energy efficient options to our clients.



Process Design & Development

EIL has a rich legacy of providing technology services for the Refineries, Gas Processing Plants, Petrochemical Plants, Offshore & Cross Country Oil, Gas, Multi-product Pipelines etc. Comprehensive engineering capabilities cover the complete project life cycle: Conceptual studies, Basic Design & Engineering,

FEED, 3D model based detailed engineering, special studies including safety, risk assessment, pre – service engineering and commissioning assistance. The special Analysis performed includes Computational Fluid Dynamics (CFD) and Dynamic Simulation.

Broad Services Offered by Process Design Division:

Project Conceptualization for Grass Roots & Revamps

- Screening Studies (Configuration Studies using LP modelling, Yield & Energy Improvement)
- Feasibility Studies (Yield & Energy Improvement)
- Detailed Feasibility Reports (Revamp Studies)
- Technology Evaluation & Licensor Selection

Basic Design for Grass Roots & Revamps

- Basic Design Package for Open Art Units
- Review of Basic Design for Licensed Units, Residual Process Design for Licensed Units
- Value Engineering & System Optimisation
- Interface Fired Heater & Heat & Mass Transfer Equipment Design in Process Optimisation

Detailed Design

- FEED Preparation
- Detailed Engineering Follow Up
- EPC Design Review (PMC)

Plant Start Up

- Plant Check List
- Pre-Commissioning Assistance
- Commissioning Assistance

Troubleshooting

“UNIQUE STRENGTHS”

- Comprehensive Services towards Plant Configuration Studies & Screening.
- Feasibility & Detailed Feasibility Reports with Level III & Level II Cost Estimates & Financial Analysis.
- Technology Selection & Process Design of all Open Art Units.
- Process Design of Utilities and Offsite facilities.
- Revamp Studies including Constructability Studies.
- Process Support during Details engineering & Project Implementation.
- Preparation of operating Manul, Operating & Start up Procedures.
- Pre commissioning, Commissioning & Start up Support.

Technology Driven Competencies

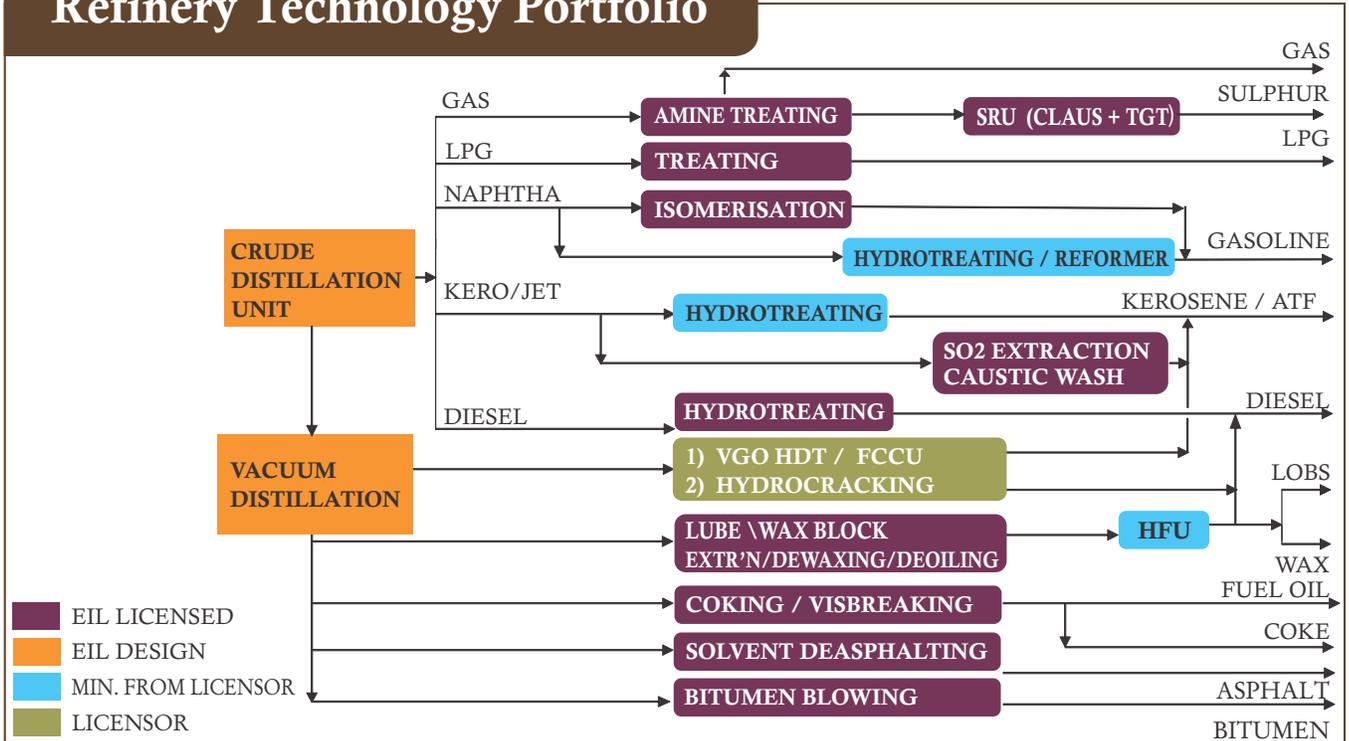
EIL Licensed Units	Features
LPG Treating/ Sweetening Unit (LPGTU)	<ul style="list-style-type: none"> Patented two stage distribution mechanism for efficient contacting between caustic and LPG Cost effective & energy efficient technology which has no dispersive energy requirements
Light Naphtha Isomerization	<ul style="list-style-type: none"> Isomerization convert the n-paraffins components in Light Gasoline to iso-paraffins EIL's technology has distinct advantages like maximization of liquid yield of isomerase product and octane gain across the unit
Food Grade Hexane Unit	<ul style="list-style-type: none"> FGH technology converts unsaturated compounds present in Straight run Naphtha to saturated compounds Advantages include a very low benzene content(<100 ppmw) in product and longer catalyst life
Aromatics Extraction technology	<ul style="list-style-type: none"> Solvent Technology for Production of Benzene- Toluene- Xylene Features such as raffinate washing, better solvent recovery and recycling of solvent makes EIL technology unique in its class
Deep desulphurization with Reactive Adsorption technology (INDAdeptG) (Along with IOCL)	<ul style="list-style-type: none"> INDAdept^G is unique process for removal of sulfur compounds from gasoline stream to produce ultra-low-sulfur gasoline at significantly lower pressure and lower hydrogen consumption in comparison to conventional Hydro treating processes Lower hydrogen partial pressure requirement and negligible yield loss makes the technology attractive Octane loss across the unit is 2 points (max)
Diesel Hydrotreating (DHDT)	<ul style="list-style-type: none"> Ultra Low Sulphur Diesel Production with Less than 10 ppmw Sulphur
Delayed Coker Unit (DCU)	<ul style="list-style-type: none"> A Cost effective option to maximize distillate yield In house Capability to carry out coke drum design, & fatigue analysis Longer Run Length & Minimum Down Time
Visbreaking Units	<ul style="list-style-type: none"> Soaker Technology for Improved Performance Soaker Internals for Improved Distillate Yield
Sulphur Recovery Unit (SRU)	<ul style="list-style-type: none"> Environment Friendly Technology Designed to achieve 99.9% including Tail Gas Treatment recovery of Sulphur Oxygen Enrichment for Reduced Unit size/ Revamp End to End Solutions for Sulphur Blocks offered based on captive technology

<p>Lube extraction technology</p>	<ul style="list-style-type: none"> • Offers lube extraction technology with both Furfural and NMP as the extraction solvent • Optimized operating parameters like solvent to feed ratios, extractor internals and number of stages • Unit offers higher energy efficiency in solvent recovery section and ensures minimum solvent loss • Lube Extraction units based on Furfural & NMP Solvent are designed to produce wide range of base stocks
<p>Lube Dewaxing / Deoiling Unit</p>	<ul style="list-style-type: none"> • Offer Solvent Dewaxing / Deoiling technology with optimum selection of solvent • Design Parameters optimized for new feedstocks based on lab runs on actual feed samples • Technology applicable for production of LOBS as well as various grades of Paraffin & Micro- crystalline waxes
<p>Solvent Deasphalting Unit</p>	<ul style="list-style-type: none"> • Offer solvent Deasphalting technology with optimum selection of solvent • Optimized design parameters to minimize energy consumption • Both, Conventional & Supercritical designs offered by EIL • Capability to design unit with high DAO yield
<p>Ammonia treating process</p>	<ul style="list-style-type: none"> • Developed to separate and process ammonia from sour water stripper (SWS) gases • Multifold advantages in form of enhanced capacity & less backpressure to SRU unit ensuring smooth operation

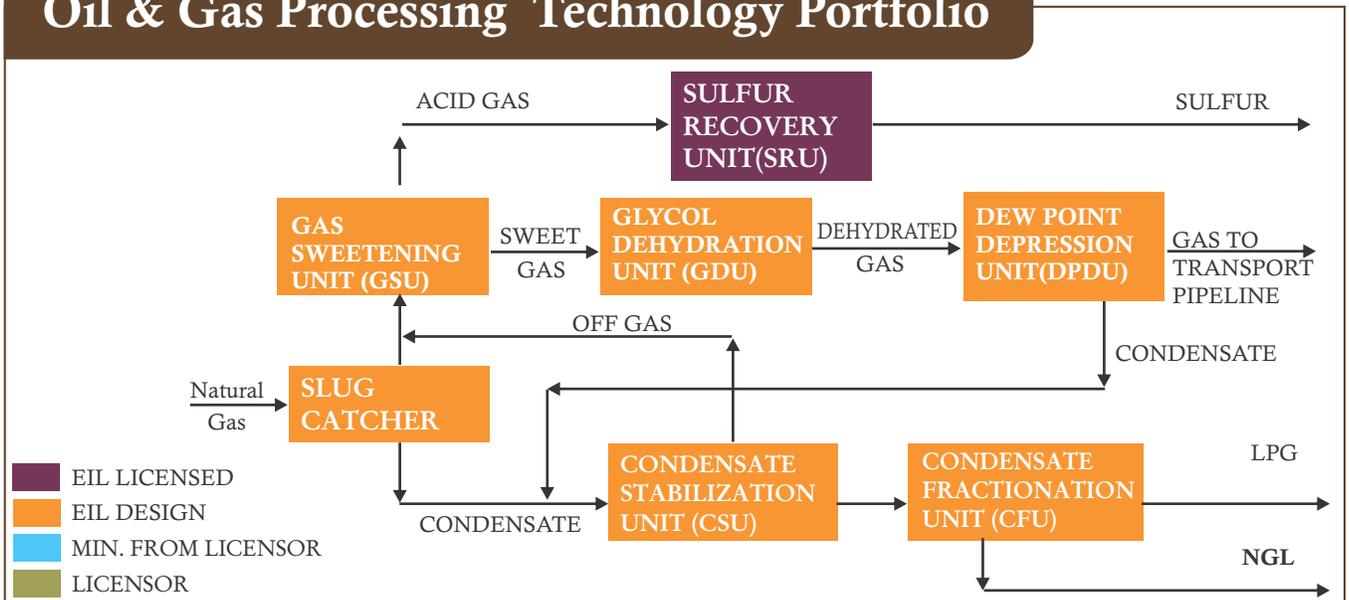


Technologies Portfolio

Refinery Technology Portfolio

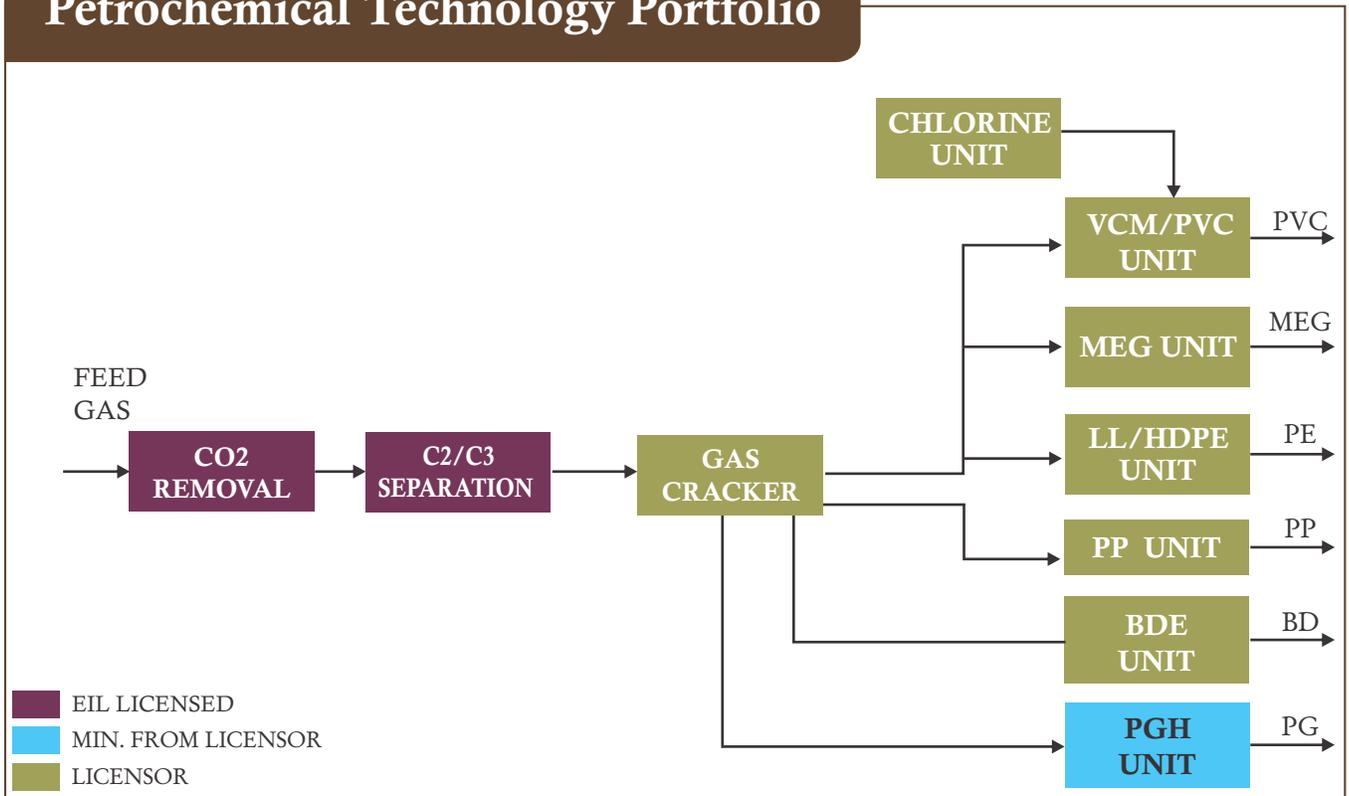


Oil & Gas Processing Technology Portfolio

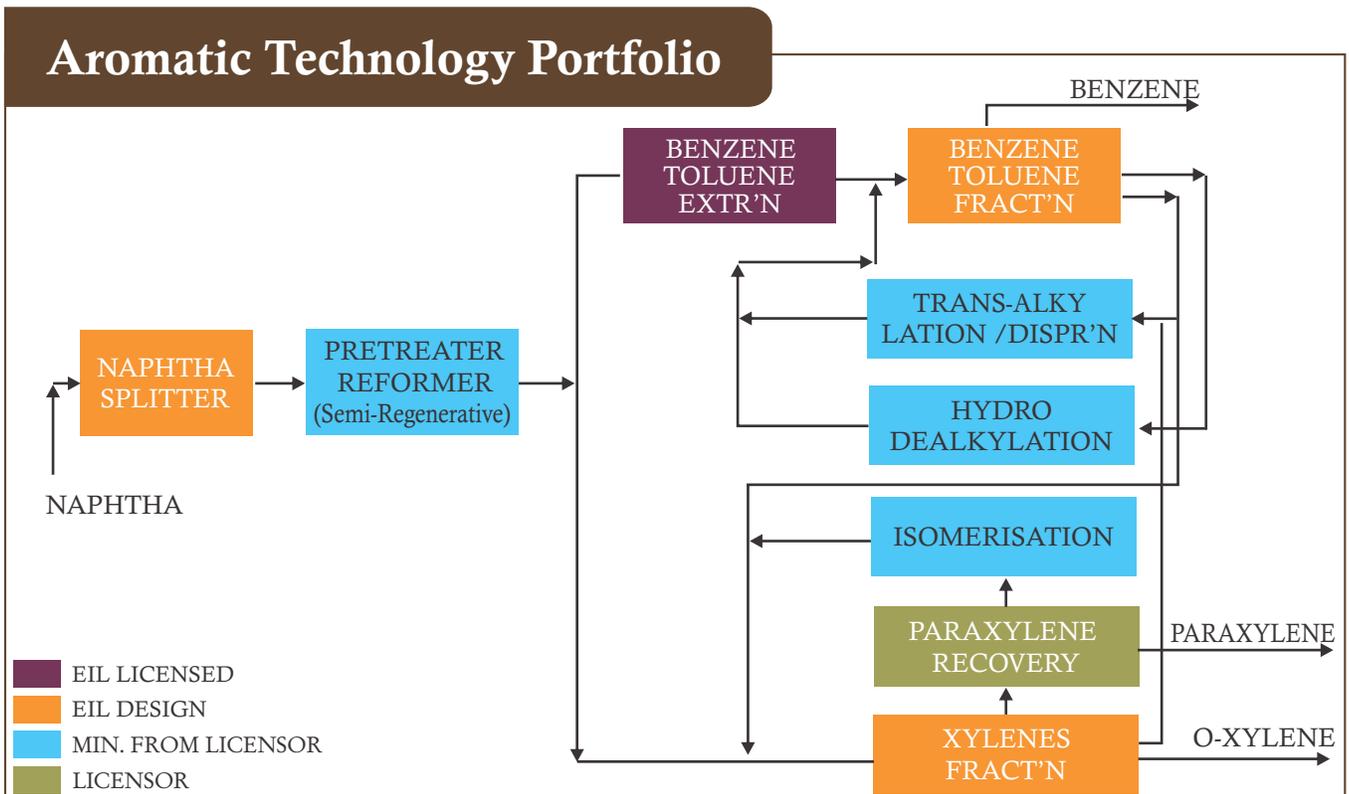


Almost All the Gas Processing Facilities in India are process designed & Engineering by EIL. EIL's gas processing designs compare with the best in the world. Maximum higher train capacity of Gas Processing plant is 21 MMSCMD.

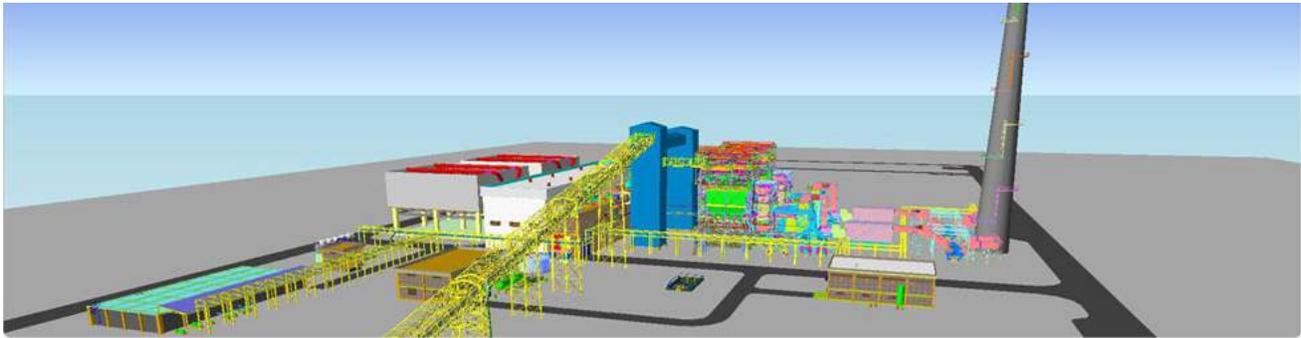
Petrochemical Technology Portfolio



Aromatic Technology Portfolio



Utility Systems



EIL Provides comprehensive process design services for all utility & offsite systems for a Refinery/ Petrochemical/ Gas Processing/ Fertiliser Complex.

Complete BDEP including system definition, operation & maintenance manual is provided for Grass roots/ Revamp Projects.

- Steam / Power / Captive Power Plants
- Raw Water Treatment & Storage
- Compressed Air & Nitrogen System
- DM Water / Boiler Feed Water / Condensate System

- Cooling Water System
- Natural Gas / Fuel Gas / Fuel Oil System
- Utilities Distribution Network

Basic Design Capabilities

- ▶ Basic design for Utility Generation for all the utilities listed above.
- ▶ Basic design of Utility Distribution network.

Offsite Systems

- ▶ Crude Storage
- ▶ Crude receipt & transfer facilities
- ▶ Flare system design & optimisation
- ▶ Ammonia storage
- ▶ LNG storage
- ▶ Cryogenic Storage
- ▶ Feed, Intermediate Products & Finished Product Storage
- ▶ Product despatch facilities – ships, rail, road, pipeline
- ▶ Effluent Treatment Plant & treated effluent disposal
- ▶ Flare Network

Services Portfolio



Feasibility Studies

Detailed Feasibility Studies

Technology Evaluation Studies

Basic Design for Open Art & EIL Licensed Process Units

Basic Design of Utilities & Offsite

Residual Process Design for Licensed Units

Preparation of FEED (Front End Engg. Design) Document

HAZOP, HAZID, HAZAN Studies

Detailed Engineering Support

Commissioning Assistance, Pre – Commissioning & Post Commissioning

Troubleshooting

Speciality Services Portfolio

Energy Improvement Studies/ Energy Audits

Configuration Studies Using Linear Programming

Heat & Mass Transfer Equipment Design

Fired Heater Design

Environment Impact Assessment Studies

Residual Life Assessment Studies

Cost Engineering

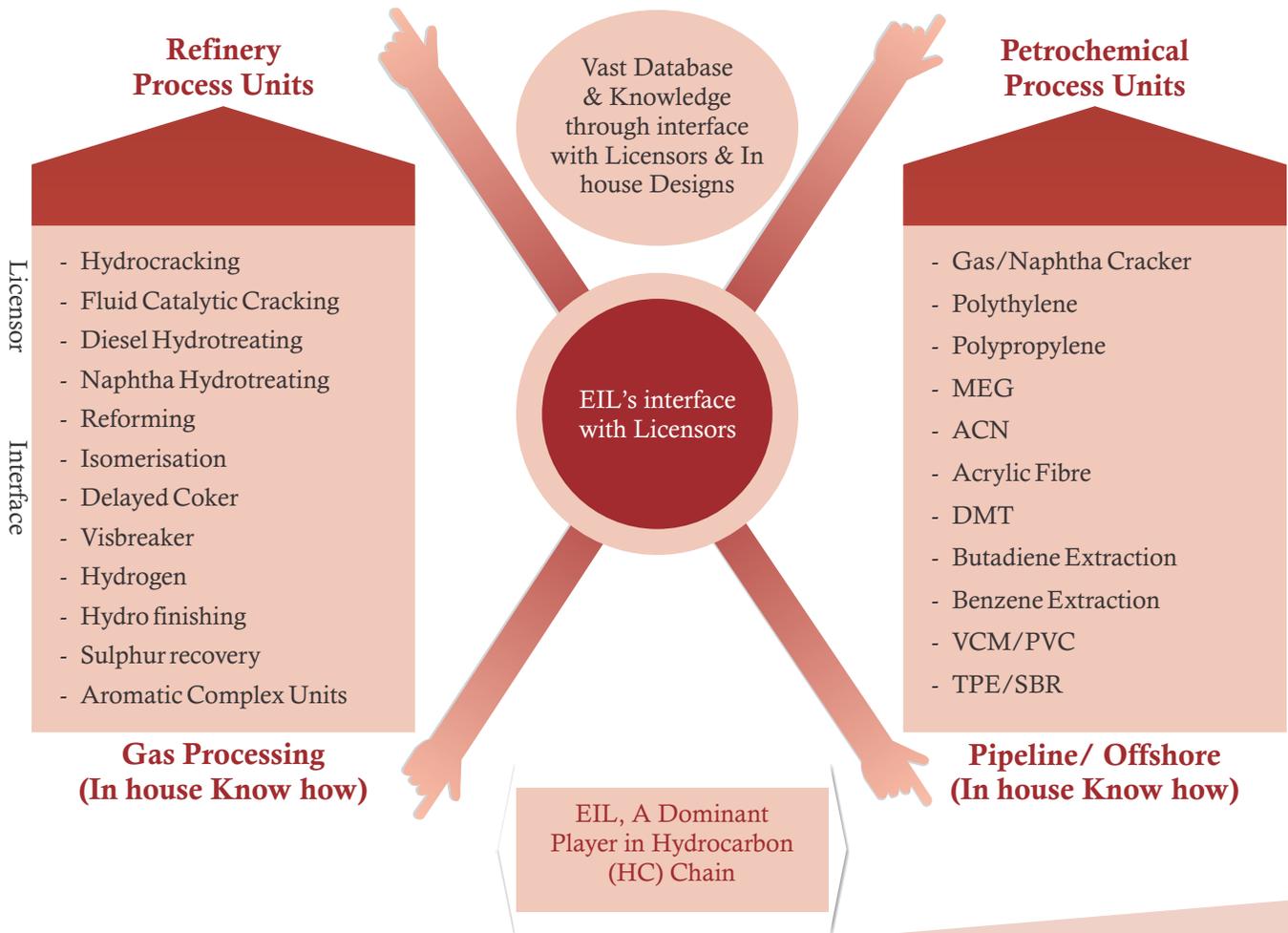
Corrosion Monitoring & Control

HAZOP/ HAZAN/ HAZID / Risk Analysis Studies



EIL Experience – Licensed Technologies

EIL has wide exposure of working with all the major technology licensors in the field of refineries as well as petrochemicals. EIL has done technology selection for various competing technologies based on technical & commercial evaluation. EIL has also been involved in the review of Basic Design Packages prepared by licensors at various stages including review of Process Flow Diagram (PFD's), Process specifications of critical equipment, P&ID's, Equipment layout etc. EIL has also carried out residual process design for all such units followed by follow up during detail engineering stage.



- EIL rich experience with almost all international licensors for various refineries & petrochemical led to creation of a significant data bank.
- Invaluable skills to impart value engineering inputs towards optimisation of Plant Configuration & hardware.
- Overall uniformity & standardization through PMS, Control, Equipment, Design Standardization.

Environmental Services offered by EIL

EIL provides services in the water, waste water and effluent recycle areas ranging from concept to commissioning and environmental pollution assessment, control and management.

EIL provides Environmental Services for Refineries, Petrochemicals, Gas Processing Complex, On-shore / Offshore oil drilling facilities, Ferrous / Non-ferrous industries and Solar thermal power plants. Our services range over a diverse areas such as Water and Waste water management, Solid & hazardous waste management, Soil & water remediation, Environmental impact assessment studies, Carbon & water foot print assessment & on Zero liquid discharge.

EIL provides Concept to Commissioning Services on there wide range of areas and also undertake stand alone studies such as adequacy checks of existing plants, pollution abatement studies, Detailed project report preparation for municipal water /sewage treatment and bio-diversity improvement/management. The services offered by EIL are listed below :

WATER TREATMENT

- Raw water treatment system (Conventional gravity filtration / membrane technologies).
- Cooling water treatment system.
- Demineralised water treatment plants (Ion exchange based & RO membrane based).
- Desalination plants (RO membrane based / Thermal based).

WASTE WATER TREATMENT

- Waste Water Treatment Plants
- Recycle Plants
- Spent Caustic Treatment Plants (Chemical oxidation based / Wet air oxidation based)

SEWAGE TREATMENT PLANTS

SOLID & HAZARDOUS WASTE MANAGEMENT (SECURED LANDFILL)

WATER & WASTE WATER AUDITS

ENVIRONMENTAL IMPACT ASSESSMENT STUDIES INCLUDING

- Environmental Management Plants
- Assistance to domestic clients till obtaining Environmental Clearance & No objection Certificate

BIO DIVERSITY IMPROVEMENT / MANAGEMENT

CARBON FOOT PRINT & WATER FOOT PRINT ASSESSMENT

AIR QUALITY MONITORING NETWORK DESIGN

SOIL AND WATER REMEDIATION

EVAPORATOR / CRYSTALLIZER PLANTS FOR ZERO LIQUID DISCHARGE

SOLAR EVAPORATION POND FOR ZERO LIQUID DISCHARGE

AIR POLLUTION ABATEMENT STUDIES

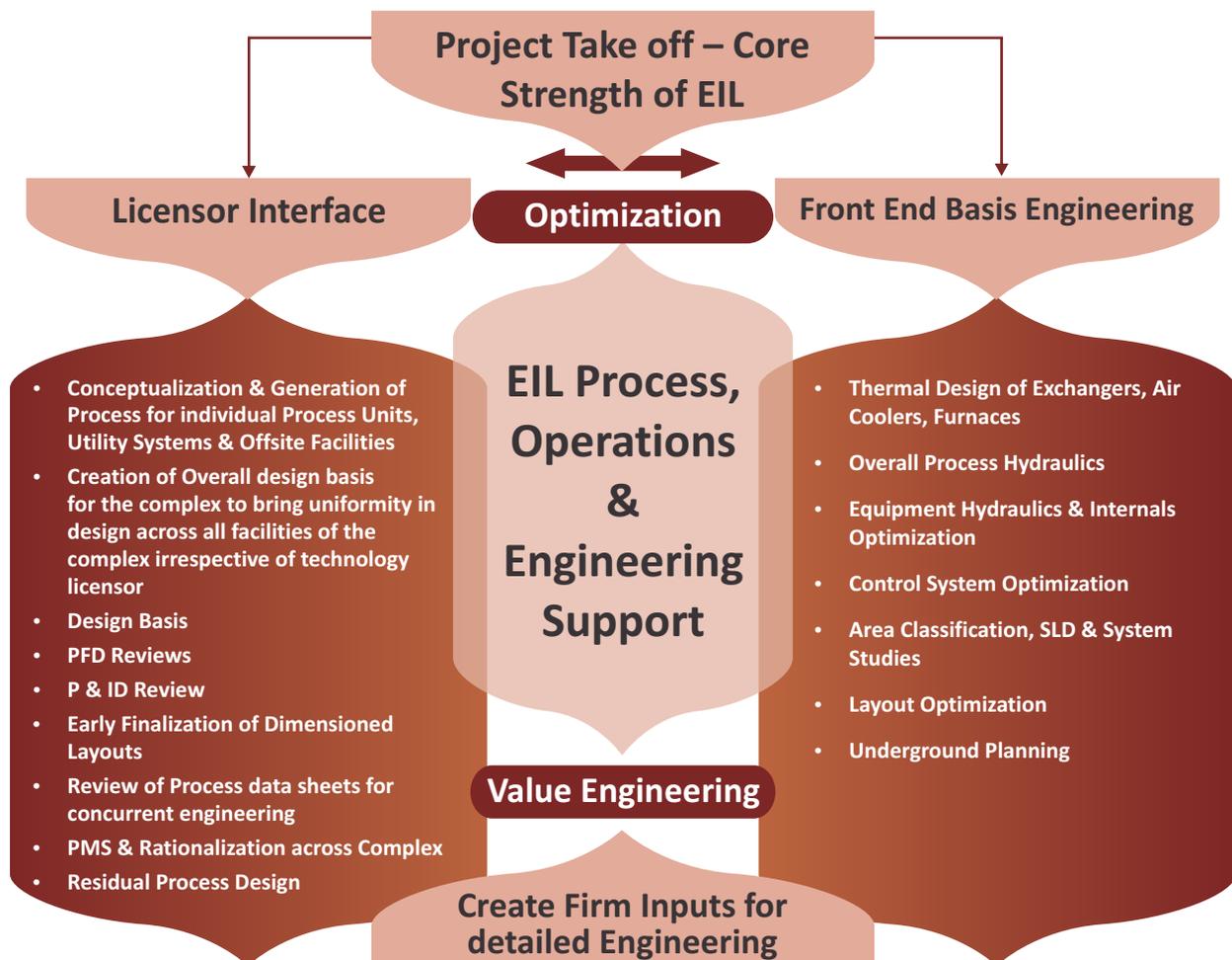
ADEQUACY CHECKS FOR EXISTING WATER / WASTE WATER TREATMENT PLANTS

DETAILED PROJECT REPORTS FOR MUNICIPAL WATER / SEWAGE TREATMENT

Delivering Excellence through Our Strengths

EIL remains dynamic & flexible to customer needs with customer as our first priority. **Our engineering capabilities extend across the entire spectrum from concept to commissioning of Projects with solution oriented pre-emptive approach. The Canvass includes:**

- Conceptual Design & Basic Engineering for open- art & EIL licensed units. The deliverables include primarily Process Flow Diagrams, Heat & Mass Balance, Equipment Specifications, Piping & Instrumentation Diagrams, Equipment Layout, Utilities & flare load Summaries, Line Schedule & instrument specifications.
- Residual Process Design of Licensed Units
- Development of Basic Design Packages based on Technology Information Package (TIP) prepared by Licensor.
- Front End Engineering & Design (FEED) including system safety, risk, adequacy, reliability, constructability & Interface Management Studies.
- Detailed Engineering
- Engineering for Procurement through a global market
- Engineering for Construction
- Field Engineering



Corporate Office

Engineers India Bhawan
1, Bhikaji Cama Place, R K Puram
New Delhi-110 066
Tel. : +91-11-26762121
Fax : +91-11- 26178210, 26194715
E-mail : eil.mktg@eil.co.in

EIL Gurgaon Office
R&D Complex, Sector-16 (on NH-8)
Gurgaon, Haryana-122001
Tel. : +91-124-3803602
Fax : +91-124-3802901
E-mail : eil.mktg@eil.co.in

Branch Office

Great Eastern Chambers
5th Floor, Plot no. 28, Sector-11
Belapur C.B.D., Navi Mumbai – 400 614
Tel. : +91-22-27599301, 27563069
Fax : +91-22-27572011, 27563094
E-mail : eil.bo@eil.co.in

Regional Office

A.G. Towers (5th Floor), 125/1, Park Street
Kolkata – 700 017
Tel. : +91-33-22298995, 22276304
Fax : +91-33-22278902
E-mail : eil.rok@eil.co.in

4th & 5th Floor, Meghdhanush Complex
Race Course Road
Near Transpek Circle, Vadodara – 390 015
Tel. : +91-265-2340326, 2340368
Fax : +91-265-2340328
E-mail : eil.rov@eil.co.in

Plot No. F-9, SIPCOT IT Park, Siruseri
Chennai - 603 103
Tel. : +91-44-27469401-9402
E-mail : eil.roc@eil.co.in

Overseas Offices

Engineers India Limited
487, Great West Road,
Middlesex, London
TW5 OBS, UK
Tel. : +44-208-5705530
Fax : +44-208-5704350
E-mail : eillondon@btconnect.com

Plot No.C-53, 17th Floor,
Business Avenue Tower,
Salam Street,
P.O.Box 126592
Abu Dhabi, U.A.E
Tel. : +971-26740101
Fax : + 971-26740707
E-mail : coeailad@eiluae.ae

Engineers India Limited
Room No. 1632,
16th Floor, Asian Biz Centre,
Orient Century Palza,
345 Xian Xia Road,
Shanghai - 200 336, China
Tel. : +86-21-22157403/05, 62292296
E-mail : eilshanghai@eil.co.in

Engineers India Limited
C/o Milan Apartment Rental
Apartment 112, Piazza Luigi di Savoia 28, Milan - 20124, Italy
Tel.: 0039-0236533017, Mobile No.: (+39) 3384678867, 3895323116
E-mail: eilmilan2012@gmail.com



ENGINEERS INDIA LIMITED

(A Govt. of India Undertaking)

Website: www.engineersindia.com

Delivering Excellence through People