



Engineers India Limited



*Over Five Decades of Experience in Executing
The Most Challenging Onshore and Offshore
Pipeline Projects in India and Abroad*



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 a unique advantage to clients like none other.

5.6 million available Technical Manhours annually

9,600 available Construction Management and Supervision Man-months annually

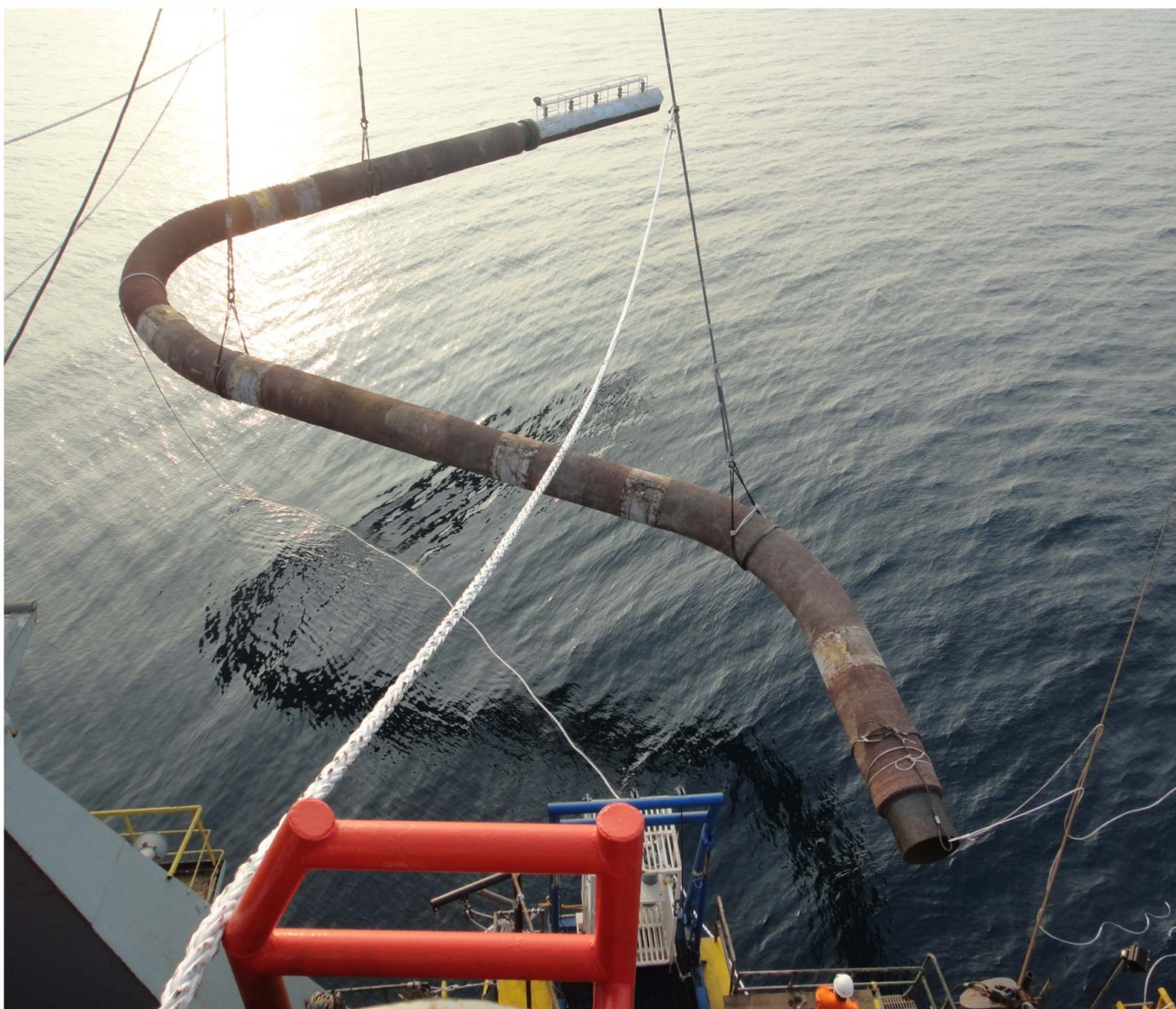
GLOBAL PRESENCE

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 green field 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

Over the past five decades, EIL has executed more than 5000 projects including over 400 major projects worth USD 200 Billion in total cost.



PIPELINE OVERVIEW

Pipelines division provides high end services in design, engineering, procurement and construction management in both onshore and offshore hydrocarbon pipelines.

EIL pipeline division, a team of 200 dedicated professionals, offers perfect blend of experience, knowledge & expertise for design, engineering, project management and construction management of onshore & offshore pipelines since early 70's. Commitment for timely completion of projects amalgamated with cost effectiveness is in the pipeline team's DNA. It is evident from long list of successfully delivered state of the art projects along with strong relationship with Clients.

EIL has wide capabilities for providing a full range of services for onshore & offshore pipeline projects:

Onshore Pipelines: Oil & Gas Cross country pipelines, spur lines,

branch lines, water pipe lines, feeder lines, compressor stations, pump stations, sectionalizing valve stations, intermediate pigging stations, dispatch terminals & receipt terminals etc. EIL has been involved in successfully delivering 30,000 + km of onshore pipelines.

Offshore Pipelines:

Submarine pipelines (trunk lines, inter-field lines, crude unloading pipelines etc.), offshore platforms, SPM systems, jetties, crossings/ other features en-route, associated risers, subsea PLEMs, subsea isolation valves (SSIV)/ laterals and termination at land fall point etc. EIL has been involved in successfully delivering 5,000+ km of submarine pipelines.

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Pipelines division has been involved in some of the most challenging onshore & offshore pipeline projects in India and abroad.

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SERVICES OFFERED



EIL provides the complete range of services required to conceptualize, design, engineer and construct pipeline systems to meet the specific requirements of the customers. EIL offers:

Pre-project services

- Feasibility studies
- Conceptual design
- Environment impact assessment
- Cost estimation

Project implementation services

- Basic engineering
- Design & detailed engineering
- Front end engineering design
- Project management
- Material selection
- Procurement & expediting
- Inspection & third-party certification
- Construction management
- Pre-commissioning and commissioning assistance.

Specialist Services

- Residual life assessment
- Optimization studies
- Specialist material & maintenance services
- Seismic Design

ONSHORE PIPELINE SYSTEMS

BACKGROUND

Considering the emergent need of transportation of hydrocarbons through pipelines in India, EIL took the initiative to start dedicated Pipelines Division as early as 1970's. Since then, it has been pioneering in writing

various success stories for the hydrocarbon pipeline systems from bygone deserts to tallest mountains, from marshy land to tropical forests, from remote locations to most populated mega cities.

HBJ Pipeline: EIL executed India's first gas pipeline i.e. Hazira – Vijaipur – Jagdishpur pipeline of 1,750 km length in late 80's. HBJ caters to India's largest pipeline network.

Jamnagar Loni Pipeline: EIL executed the world's longest exclusive LPG cross country pipeline in 2001. The pipeline is 1,240 km long.



PROJECT HIGHLIGHTS (ONSHORE)



Project	Dabhol Bangalore Pipeline
Customer	M/s GAIL (India) Ltd.
Location	Western Ghats (mountain range)
Service	Re-gasified LNG

The 1,000 km long pipeline along western ghats, predominately hilly, crossing Amba Ghat & Tillari Ghat was completed in record time of 2 years. EIL successfully executed the project by conventional method in which pipeline route encountered slopes of 45°. Special protection measure for soil & slope stabilization was designed and installed.

Project	Mundra Bathinda Pipeline
Customer	M/s HMEL
Location	Eastern fringe of Thar desert, India
Service	Crude Oil

The 1014 km pipeline route across the bygone desert was characterized by severe climate and remote locations. Sand dunes at some places along the route were more than 40 m high. First time in India, a cross-country pipeline of this magnitude was laid in such obscure location. Innovative trench cross-section & design technologies was used to avoid erosion/exposure of pipeline & construction equipment suitable for terrain was deployed



Project	South Jetty Pipeline
Customer	M/s IOCL, India
Location	Paradip, India
Service	High Sulfur Fuel Oil

The project facilities include 17 nos. of pipelines of total length 150 km of size 4" to 38" in common corridor from Jetty area to Paradip Refinery including Electrically heat traced pipeline of size 18". HDD of the Electrically Heat Traced and insulated pipeline has been carried out for the first time in India.

PROJECT HIGHLIGHTS (ONSHORE)

Project Mangalore Bangalore Pipeline
Customer M/s Petronet MHB Ltd.
Location Southern India
Service Multi-product

Pipeline of 24"/20" size was laid in highly undulating terrain in Charmandi Ghat (mountain range) with a maximum of 60 bends in single kilometer. Slopes of upto 70° were encountered along the pipeline route. The right of work was reduced to 7 m in hilly terrain due to dense plantation. Pipeline was welded in trench for a 24 km long stretch.



Project Vijaipur Dadri Bawana Pipelines
Customer M/s GAIL (India) Ltd.
Location India
Service Re-gasified LNG

48" OD (max.) pipeline of 500 km length was laid in a record time for supplying the gas for Common Wealth Game 2010. Pipeline also comprises two compressor stations at Vijaipur and Jhabua. Major crossing was Chambal river which was crossed by 1200 m long HDD in hard rock.

Project Numaligarh Siliguri Pipeline
Customer M/s Oil India Ltd.
Location North East India
Service Multi-Product Pipeline

EIL commissioned 265 km long 14" size multiproduct pipeline in the tropical rain forest receiving heavy rainfall of 1000 - 1500 mm. The sub soil strata of the rivers en route the pipeline was having gravels & boulder. Micro-tunnelling was performed for crossing rivers.



PROJECT HIGHLIGHTS (ONSHORE)



Project
Customer
Location
Service

Bina Kota Pipeline
M/s BPCL
Central Western Region, India
Multiproduct

Successfully engineered & commissioned in the year 2009 by EIL, this 18", 257 km multiproduct pipeline was laid in a wide variety of terrain ranging from flat agricultural terrain to hilly & unstable rocky terrain.

Project
Customer
Location
Service

Mundra Delhi Pipeline
M/s HPCL
Western Northern
Region, India
Multiproduct

18"/16" x 1050 km long product pipeline involving despatch station, 10 nos. receiving stations, 8 nos. Pumping and Pigging stations, three nos. HDD crossing (Railway canal, Narmada canal etc.), 34 nos. sectionalizing valve stations. The concept of telescopic pipeline wall thickness has been implemented for the first time in India.



Project
Customer
Location
Service

Vadinar Bina Pipeline
M/s BORL
Western Central Region, India
Crude

The project facilities included 24 inch onshore pipeline system of length 930 km. The onshore pipeline system consists of a Dispatch terminal, 2 nos. intermediate pigging cum pumping stations and 2 nos. pigging stations, 29 nos. SV stations and receipt station. Rocky terrain was encountered in approx. 100km stretch of the pipeline. Rock blasting was used to create trench for the pipeline in this terrain.

PROJECT HIGHLIGHTS (ONSHORE)

**Project
Customer
Location
Service**

**Dabol Panvel Pipeline PH-I & PH-II
Gail (India) Ltd.
Western Ghat, India
Regasified LNG**

Pipeline of 30" size was laid in two phases (187 km + 120 km) in the rocky terrains of western ghats between the period of 2006-2008. Major HDD crossings were executed in the rocky river bed (hard rock) of kal river (910 m), savitri river (600 m) and vashisti river (1000 m). Pipeline also encountered steep slopes of upto 70 degrees at Nagfani hills.



Project: Pipeline replacement project
KG Basin (Phase-I & II)
Client: M/s GAIL India Limited

Basic design, detailed engineering, construction supervision for replacement of 4" to 24" size pipeline network of 250 km length including. The project includes 41 nos. of pipeline crossings, cumulative length 20 km, by HDDs methodology across major rivers such as Goutami-Godavari, Vashistha-Godavari and Vynatheym Rivers.

MIDDLE EAST PIPELINE PROJECTS

Asab, Bab, Buhasa&Ruweis (ABBR) Modifications Project

Client : M/s Abu Dhabi Gas Industries (GASCO), UAE

Owner's engineer for FEED of 10 pipelines of diameters varying from 48" to 10" and total length of 200 km in desert and sabkha areas. The project includes scraper launcher, receiver and SV stations and pipeline installation across various crossings such as highways, roads and rig roads.

NGL Pipeline Project

Client : M/s Abu Dhabi Gas Industries (GASCO), UAE

PMC Services for 16" to 30" pipeline network of 250 km length connecting Asab, Bab, MP21, Ruwaise and Buhasa terminals including scraper launcher, receiver and SV stations and pipeline installation across various crossings such as Highways, Roads and Rig Roads. The scope also consists of decommissioning, inertization and dismantling of existing pipeline network in the desert areas and Sabkha Areas including all civil, mechanical, and electrical and instrumentation works.

Qusahwira Full Field Development Project

Client: M/s ADCO (Abu Dhabi)

Basic design, detailed engineering, engineering for procurement for 20", 14", 8", 6" diameter main oil pipeline, production flowlines (surface laid), gas injection flowlines from wells, gas transfer lines, including water injection and water disposal pipelines of total length 200 km including 2 Nos. SV stations and pig launchers and receivers.

Habshan Ruweis Shuweihat Pipeline

Client : M/s Abu Dhabi Gas Industries (GASCO), UAE

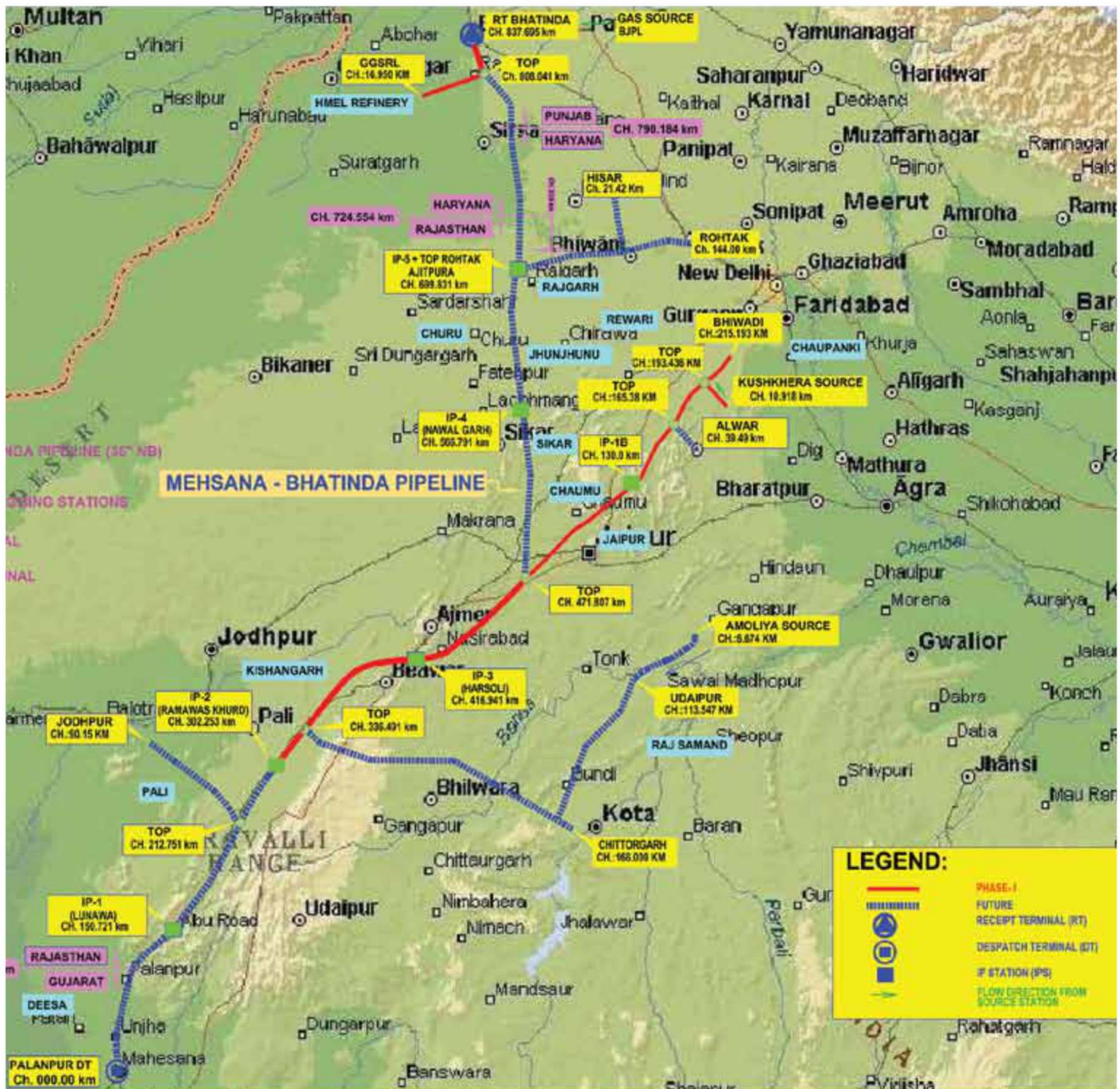
PMC Services for 52"/48" x 125 km length pipeline network connecting SV terminals including pipeline launcher, receiver and SV stations. Pipeline fabrication involved automatic welding & AUT including installation of pipeline across various roads, highways & rig road crossings. Project also included two numbers of Hot Tapping & stopple plugging works of size 52" in existing manifold.

Inter Refinery Project

Client: M/s TAKREER-Abu Dhabi, UAE

FEED Services for 10" to 16" product pipeline system of 750 km length including despatch stations, receipt terminals, intermediate pumping and pigging stations, sectionalizing valve stations and tap off station at ADIA and associated SCADA, Telecom, Electrical & Instrumentation facilities.

MAJOR ONGOING PROJECTS



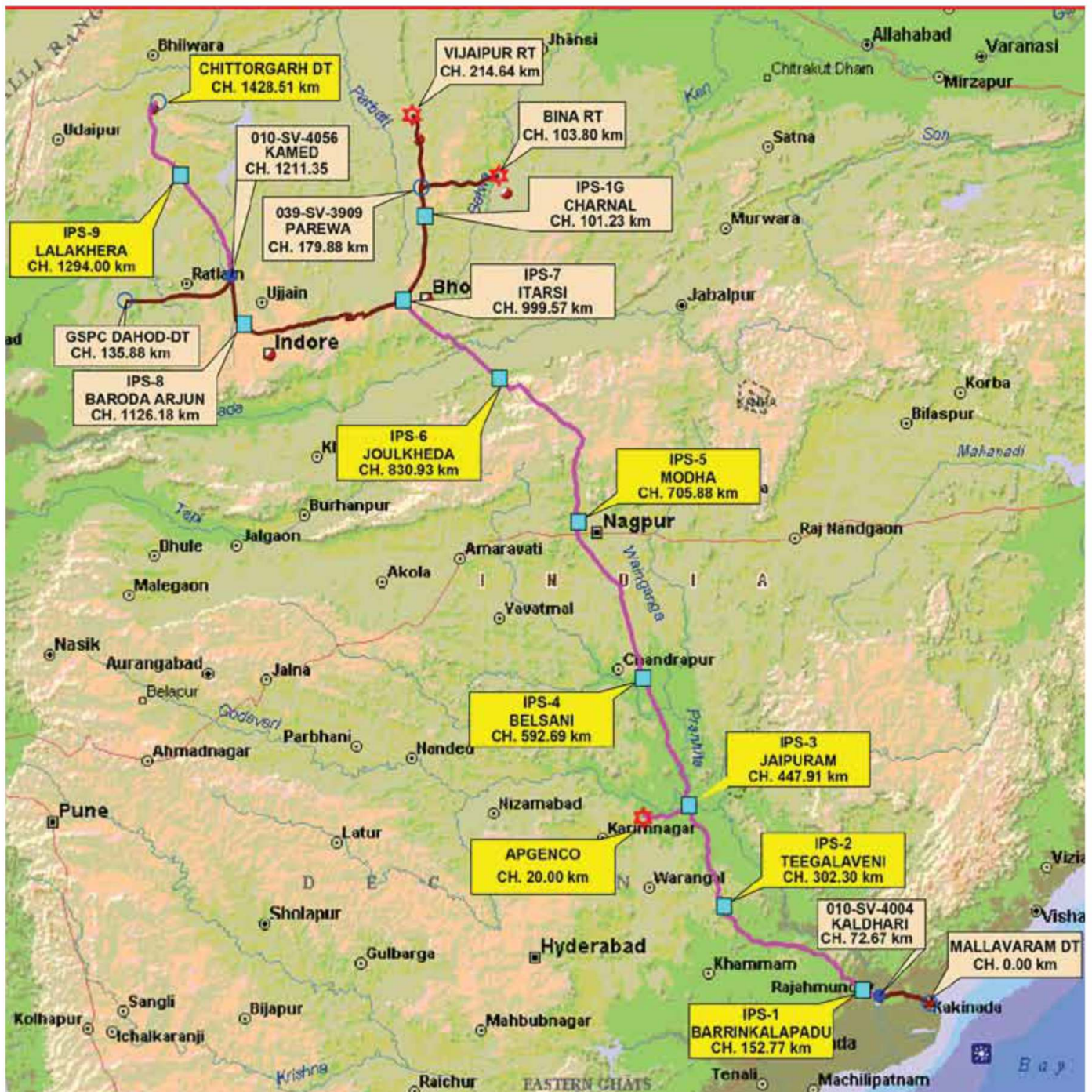
Project	Mehsana Bathinda Pipeline
Customer	M/s GIGL
Service	Natural Gas

EIL is currently involved in FEED & PMC of circa 1,650 km long natural gas cross country pipeline. The mainline, 850 km long, originates from the state of Gujarat and terminates in Punjab. The pipeline network consists of 9 numbers of spur lines of total length circa 800 km. The estimated project cost is approx. \$ 786 million.

MAJOR ONGOING PROJECTS

Project	Mallavaram Bhopal Bhilwara Vijaipur Pipeline
Customer	M/s GITL
Service	Natural Gas

EIL is currently involved in FEED & PMC of circa 1,900 km long natural gas cross country pipeline. Pipeline will transport Natural Gas from Krishna Godawari basin in east Coast of India to Bhilwara via. Vijaipur traversing through five states of India. The estimated project cost is approx. \$ 1140 million.



MAJOR ONGOING PROJECTS

HEATED PIPELINE :

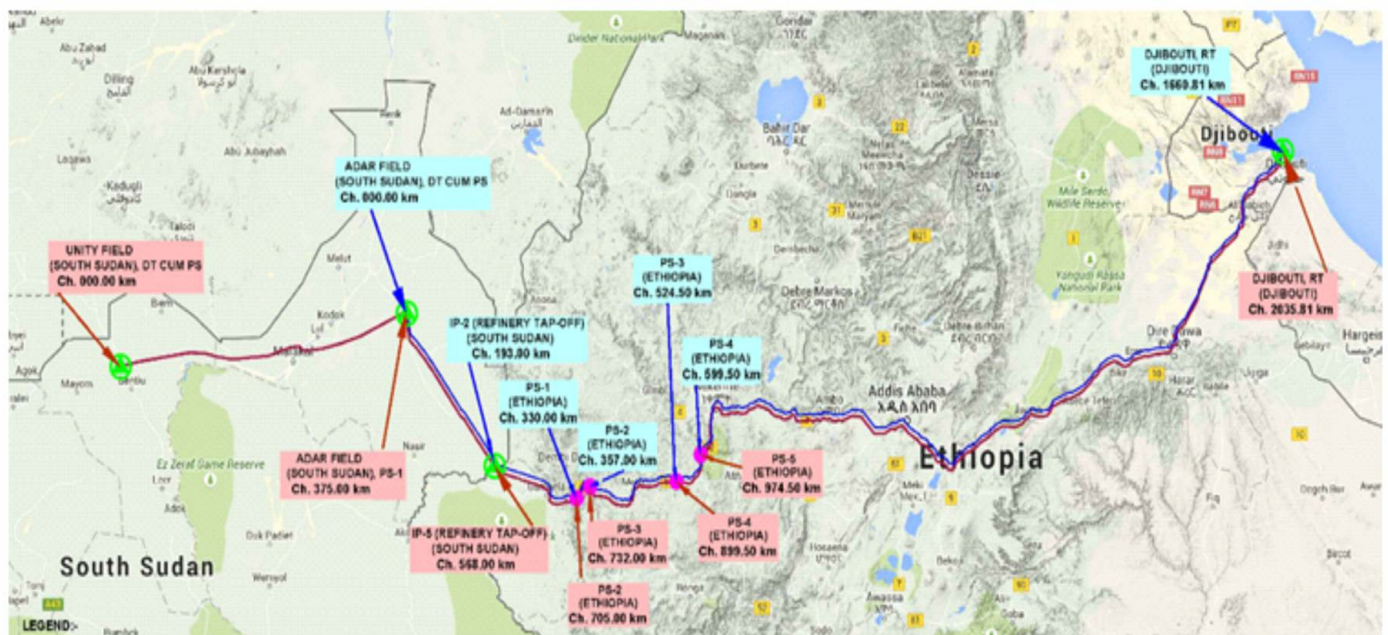
- DFR for 48" x 1661 km (skin effect electrical traced heated line) & 30" x 2036 km long (with pour point depressant dosing) South-Sudan-Ethiopia-Djibouti Transnational Crude oil pipeline schematics.
- EPCM for 20" x 11.0 km long (skin effect electrical traced heated line) from Ernakulum South Jetty to Kochi Refinery for high pour point products. (ongoing)

Project : DFR for South Sudan Ethiopia Djibouti crude oil pipeline

Customer : A&A group

Location : Central Africa

This Detailed Feasibility Report (DFR) includes activities like conceptual studies, pipeline routing, pipeline route analysis & finalization to name a few. Google geo-mapping software has been extensively used for carrying out the various desktop studies. The pipeline route presents some unique challenges wherein the elevation profile of the route varies from 5 meters above MSL to as high as 2600 meters above MSL. The route also encounters challenging crossings like the Great Rift Valley and major African river crossings, including the River White Nile.



MAJOR ONGOING PROJECTS

TREATED EFFLUENT PIPELINE (CARBON STEEL) :

Project : Brahmaputra Petrochemical Project

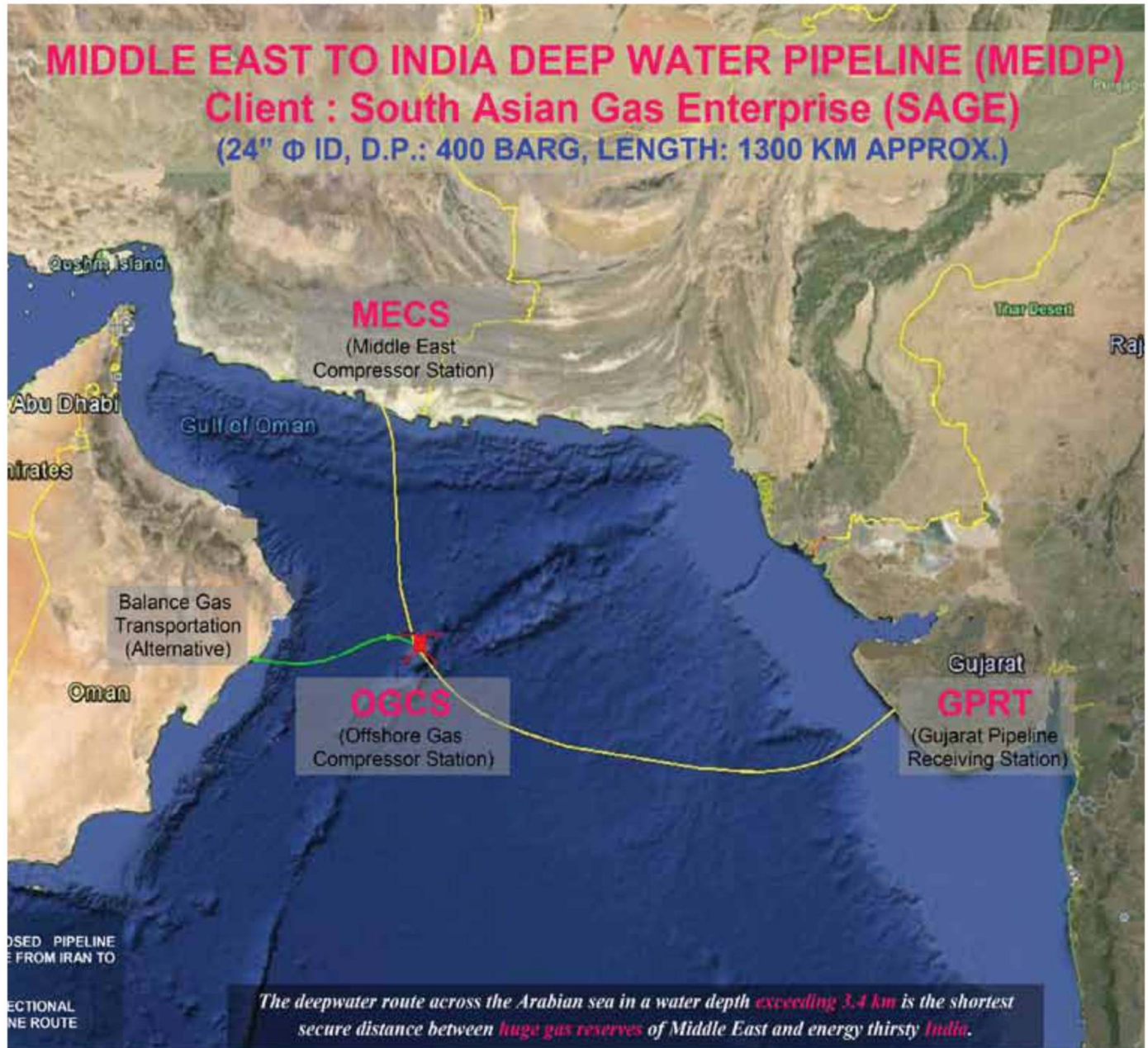
Customer : BCPL (Brahmaputra cracker & Polymer limited)

Location : Assam (North Eastern, India)

- 28" x 14 km Pipeline: The ongoing project has EIL as a PMC and is a carbon steel, water pipeline wherein the diffuser system is being installed on the river bed.
- 28" x 14 km long treated effluent pipeline from BCPL Complex to Brahmaputra River including diffuser system.



MAJOR ONGOING PROJECTS



SAGE (South Asia Gas Enterprise Pvt. Ltd.) has been developing the deep sea offshore gas pipeline project from Middle East to India. The pipeline is anticipated to be the first of many in a corridor of pipelines that will form the final leg of a major energy supply route linking the Middle East with India. Middle East to India Deepwater Pipeline (MEIDP) offshore route traverses 1300

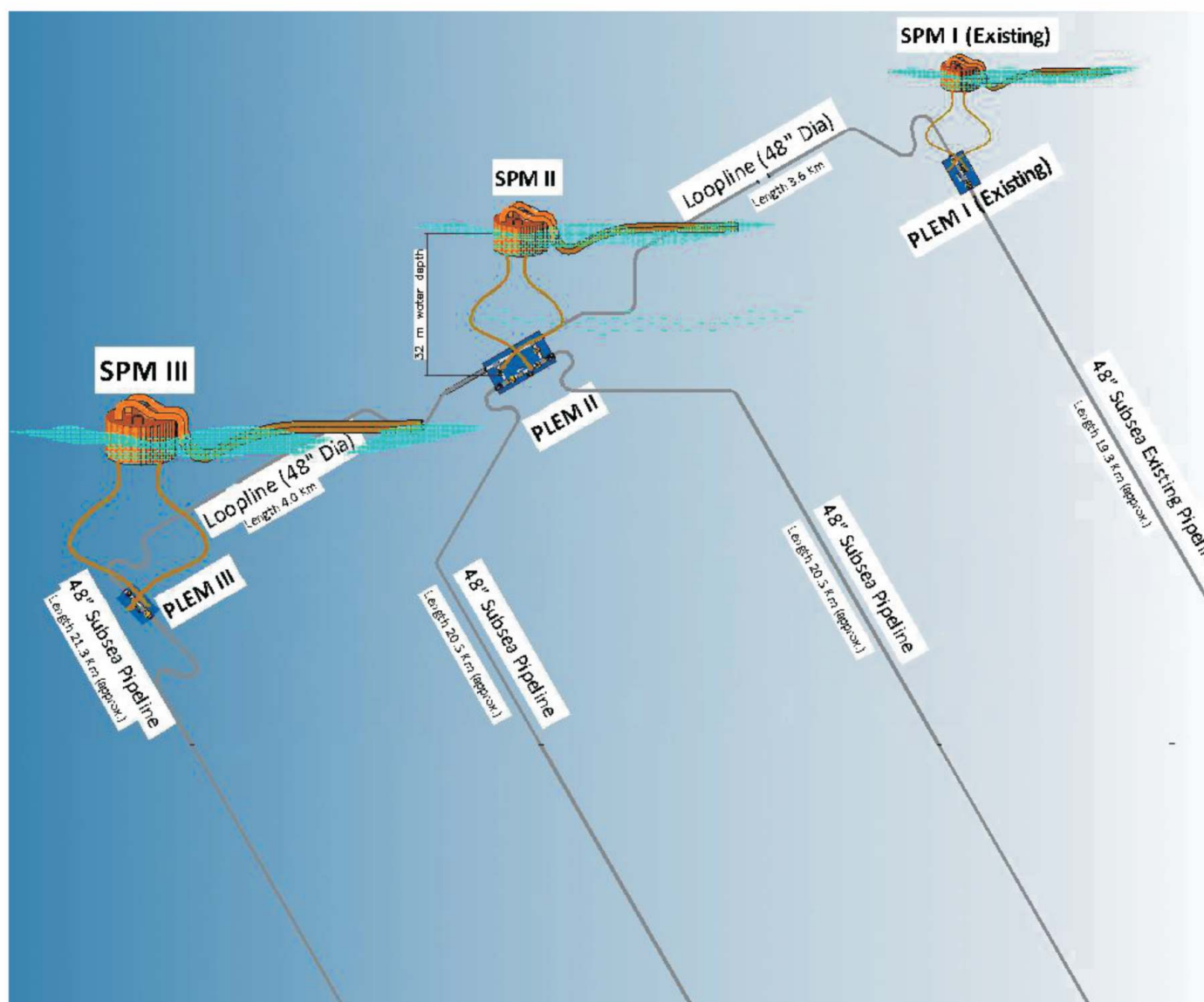
km from Middle East to Porbandar on the Saurashtra coast line of Gujarat and reach water depths of around 3,450 m in the Arabian Sea. The 610 mm pipeline has been sized to facilitate the delivery of 1.1 BSCFD of sales quality natural gas to India.

“ EIL is associated with conceptual design of world's deepest planned submarine pipeline ”

OFFSHORE PIPELINE SYSTEMS

Project Integration of three SPM's at Paradip
Customer Indian Oil Corporation
Location Bay of Bengal

EIL designed and provided PMC services for developing the Integrated Crude Unloading Facilities in offshore waters of Paradip in East Coast of India. The integration philosophy of three SPM systems & multiple tankers birthing simultaneously and unloading of crude from any of the three SPM systems through a 100 km long network of 48" dia. submarine pipelines was designed by EIL and implemented for the first time in the world. Subsea Pipeline End Manifold (PLEM) weighing 480 ton & measuring 28×11.5 square meters (largest till date), equipped with nine(9) nos. of hydraulically operated valves and tie-in spools in 30 meters of water depth was successfully installed as a part of the project. The project was recognized by ASME in Global Pipeline Award (GPA) 2013.



INTEGRATION OF THREE SPM SYSTEMS AT PARADIP

SUBMARINE PIPELINES



Major executed projects – at a glance

Offshore Pipeline (Import) & SPM system	HMEL	2010	Arabian Sea	48"	10	Crude
Offshore Pipeline (Import) & SPM system	BORL	2008	Arabian Sea	48"	10	Crude
Mumbai High to Uran Trunk Pipeline (MUT)	ONGC	2005	Bombay High	30"/28" & 12" to 22"	410 (205×2) 100	Crude, Gas
Vasai East Development Project	ONGC	2004	Bombay High	18"	20	WF

SUBMARINE PIPELINES

RSPPM Project	ONGC	2003	Bombay High	4" TO 16"	135	Well fluid, Gas Lift, Water Injection
N11 &N12 Project	ONGC	2003	Bombay High	8" TO 16"	120	Well fluid, Water Injection
Water Injection Pipeline Replacement Project	ONGC	2001	Bombay High	6" TO 16	80	WI
B-55 Development Project	ONGC	2000	Bombay High	16"	77	Gas
B-121/B-173 Development Project	ONGC	1998	Bombay High	12"/16"	65	Gas
ICP - HeeraTrunkline	ONGC	1996	Bombay High	30"/22"	145	Crude
Second BasseinHazira	ONGC	1995	Second Bassein	42"	245	Gas
Neelam Process Complex Pipelines	ONGC	1994	Neelam Field	6" to 36"	130	Sour well fluid, gas, oil and water injection
HeeraUran Trunk Pipelines	ONGC	1991	Heera Field	26"/ 24"	162 (80 each)	Gas, Oil



MAJOR ONGOING PROJECTS

Project Deen Dayal Field Development
Customer Project
Location Gujarat State Petroleum Corporation
 KG Basin, Indian Ocean

EIL provided Project Management Service for the development of Deen Dayal Field which consisted of 20" dia. high temperature high pressure pipeline 21.5 km from the offshore platform to landfall station through the riverine zone. It also included 14 km long effluent disposal pipeline of 10" dia.



Project Dangote Refinery and Petrochemical Project
Customer Dangote Oil Refining Company
Location Lekki Free Trade Zone, Lagos
 Nigeria

EIL is carrying out detailed design and engineering for nine offshore pipelines of 48" & 24" dia. circa 100 km for the integration of upcoming loading and unloading facilities consisting of five (5) nos. SPMs at a water depth of 45m to 35 m.

Project Kuzey Marmara Offshore Platforms and Submarine Pipelines
Customer Turkish Petroleum A.O.
Location Sea of Marmara

EIL is performing Advance FEED studies of two nos. of 28" OD submarine pipelines (including piggyback instrument air lines) and risers of cumulative length 4.5 km in a maximum water depth of 46 m from two nos. of fixed offshore platforms to landfall station.



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Delivering Excellence through People