Technip in India

Technip profile

A world leader in engineering, project management and technologies, serving the energy industry for more than 50 years

A regular workforce of 30,000

Confirmed leadership and proprietary technologies in 3 business segments:

**Subsea**
In subsea hydrocarbon field development, Technip’s activities include the design, manufacture and installation of rigid and flexible subsea pipelines and umbilicals. Thanks to its portfolio of technologies and industrial and operational assets, Technip offers a unique vertically integrated model in the industry.

The Group has 3 flexible pipe manufacturing plants, 4 umbilical production units, 9 logistics and pipeline assembly bases, and 1 construction yard. Technip’s worldwide leadership is supported by a modern fleet of vessels for subsea construction, pipelay development (rigid and flexible pipes using S-Lay, J-Lay or Reeled technology) and heavy lift applications.

**Offshore**
In the Offshore business segment Technip performs engineering, procurement, construction, installation, commissioning and the refurbishment/upgrading of offshore facilities for the oil & gas industry.

Technip provides these services for fixed platforms in shallow water with conventional sub-structures and self installing platforms such as the TPG 500 and for deepwater facilities including Spar, semi-submersible, TLP, FPSO and FLNG units. Technip is a world leader in floatover installation of topsides and its R&D effort is focused on technology transfer for local content and new frontier areas such as ultra-deepwater and the Arctic.

**Onshore**
Technip covers the full range of onshore facilities for the oil and gas chain, petrochemicals and other energy industries (nuclear, renewables including biofuels and offshore wind). It holds many proprietary cutting-edge technologies and is the leader in the design and construction of LNG and gas treatment plants as well as ethylene, hydrogen and syngas units.

Technip is also one of the key actors in refining and petrochemical units, and has developed a leadership in the fertilizer industry. Moreover, the Group is very active in non-energy activities such as mining and metals, life sciences, buildings and infrastructures.
An EPC contractor

Technip KT India is a technology driven, environment and safety conscious EPC contractor, serving the Oil & Gas (Upstream & Downstream), fertilisers, chemicals, pharmaceuticals and associated market sectors on a global basis.

Technip KT India is a wholly owned entity of Technip, a world leader in engineering services to the Oil & Gas industry. We are located in Noida, India. Over the last 40 years, Technip KT India has built itself a reputation as one-stop consultancy organisation, delivering concept-through-completion services and implementing diverse core sector and high technology turnkey projects, including start-up and commissioning.

A customer-focused organisation

We are committed to providing our clients with high quality, timely and cost effective solutions. We offer innovative technology, proven design procedures and high quality standards to our clients, while at the same time striving to suitably tailor our offering to the needs, constraints and resources of a given client.

A team of dedicated professionals

At Technip KT India, for each project, we deploy an extremely competent and committed team of professionals with sound knowledge base and proficiency in project management skills, state-of-the-art technologies and software. Our company takes advantage of worldwide procurement capabilities of the Technip group to most project cost, quality and schedule requirement for the benefit of its clients.

State-of-the-art IT systems

Technip KT India’s state-of-the-art Information Services and Communication infrastructure forms the backbone of the business operations and adds to the efficiency of business processes. Electronic documents management system and workflow management are built-in in the operational procedures. The office at Noida is seamlessly integrated within the Technip group’s Wide Area Network through dedicated circuits.

Certification

Technip KT India’s management is committed to ensuring the quality of all projects by ensuring compliance to ISO 9001:2008 and has instituted a technical quality review (TQR) system. TQR’s are conducted to check compliance with respect to correctness of input data/interfaces, completeness of documents, compliance to various codes/standards, validation of design methods, optimisation of design and value engineering.
Economic evaluation, Technical and feasibility studies & Technology tie ups
Cost estimation, Resource planning, Project planning, and Cost control
Conceptual design, Basic design, CFD modelling, Front End Engineering design and Detailed engineering
Purchasing, Inspection and Expediting, Logistics management and Customs clearance
Construction supervision & Site management, Subcontracting fabrication, erection, installation, hookups, testing and pre-commissioning
Process performance monitoring and improvement, Process integration and Pinch analysis, Furnace efficiency improvements, HAZOP studies and Safety audits
State-of-the-art technologies
- Hydrogen production and management
- Syngas
- Reducing gas
- Oil & Gas processing
- LNG Plants
- Ethylene plants
- Petrochemical Plants
- Sulphur recovery units (SRU) and tail gas treatment
- Cryogenic storage & distribution facilities for hydrocarbons
- Recovery of CO₂ from flue gas
- Crude/vacuum distillation
- Naphtha Splitters
- Fired heaters
- Pipelines
- Amine treatment/sour water stripper
Specialised services
- Firewater network studies
- Process integration studies
- Pinch analysis
- Energy audit
- CFD studies
- Process performance monitoring
- Pre-commissioning and start-up
- HAZOP studies
- Risk analysis
HSE
- Protection of people
- Protection of the environment
- Protection of equipment / Property
- Firewater network studies

Software
- ACE Tools
- Auto CAD
- Bentley Software
- CAESAR II
- DATREC
- EDRA
- FLUENT
- FRNC 5
- GAMBIT
- HAZOP PC
- HAZOP PRO
- Hensim / Supertarget
- HOS (proprietary software)
- HTRI / HTFS
- HYSYS, PRO III
- INTOOLS
- ISOSKETCH
- Math CAD
- MICROPROTOL
- MICROSTATION
- MS PROJECTS
- Oracle
- PDMS
- PDS 3D
- PIPENET
- PIPESIM
- PMR
- PRIMAVERA
- PROM
- PROSTEAM
- PVLITE
- SACS
- Smart Plant Electrical
- Smart Plant P&ID
- Smart Plant Review
- Smart Plant Software
- SQL Server
- STAAD PRO
- Suretrack
- XSTEEL
- ZOOMCOST

Concept to Commissioning

Feasibility
Cost estimation, Resource planning, Project planning, and Cost control
Economic evaluation, Technical and feasibility studies & Technology tie ups

Project Management
Conceptual design, Basic design, CFD modelling, Front End Engineering design and Detailed engineering

Design & Engineering
Purchasing, Inspection and Expediting, Logistics management and Customs clearance

Procurement
Construction supervision & Site management, Subcontracting fabrication, erection, installation, hookups, testing and pre-commissioning

Construction
Start up and commissioning

Commissioning
Process performance monitoring and improvement, Process integration and Pinch analysis, Furnace efficiency improvements, HAZOP studies and Safety audits

Operations

Quality Management Process

Internal Audits
Team of Experienced Internal Auditors

Inputs from Partners, Clients, & Suppliers
Suggestions
Reviews

Work Process Improvement

State-of-the-art technologies

Specialised services

HSE

Technip KT India Ltd.
Technip KT India has been delivering concept-through-completion services over the last 40 years. Technip KT India has successfully executed a large number of process plants on a LSTK basis across the world.

World class Process Engineering
- Feasibility and conceptual studies
- Basic engineering packages
- FEED packages
- Experience with international process licensors
- Process / Energy efficiency improvements
- HAZOP studies, risk analysis
- Computational Fluid Dynamics analysis
- Thermal design of fired heaters, heat exchangers and air coolers
- Grassroots projects and revamp plants
- Pipeline steady state, transient & surge analysis

International Quality Engineering
- Extended Basic Engineering / FEED
- Detailed engineering
- 3D plant design & review, walk through
- Technical quality review system
- Constructability reviews
- Efficient use of information technology and network communication tools

Professional Project Management
- Timely execution of projects
- Meticulous planning from concept commissioning
- Effective cost monitoring and control
- Project management tools

Procurement on a worldwide basis
- Mission is to generate and capture value
- Procurement, expediting and inspection services to international standards
- Continuous enhancement of vendor database
- Nation-wide inspection and expediting network
- E-procurement through www.epc-business.com, the Technip group’s procurement portal

World-class construction
- Construction management through experienced workforce
- Tailored to meet type, site, location and complexity of projects

Major engineering assignments - 50,000 to 1 million hours
- Essar Oil - CDU/VDU/DHDT/NHT/CCR
- IOCL Guwahati HDT & Hydrogen Generation Unit
- CPCL Hydrogen Generation Unit
- HPCL Mumbai DDDS + Utilities/Offsites + Sulfur Recovery Unit
- MRPL, Mixed Xylene Unit
- Ethylene plant for Ras Laffan Olefins project, Qatar
- FCCU, IOCL, Mathura

Bringing competitive edge to customer projects
The Technip group is the leading company in the Oil & Gas industry. It has executed world-scale units in offshore and onshore oil & gas processing and hydrocarbon sector. Technip KT India’s engineers have been trained in various Technip offices and have requisite experience and resources to perform concept to commissioning of oil & gas processing plants.

Technip KT India brings in the vast experience of the Technip group to India. Highly experienced professionals of Technip KT India provide services ranging from wellhead, Onshore/Offshore processing, pipeline transportation to Group Gathering Stations, oil & gas onshore terminals. We have a comprehensive understanding of the issues such as interest to owners, contractors and suppliers and can offer single source responsibility, using state-of-the-art design and engineering tools to execute Oil & Gas Projects on a turnkey basis.

**Field development**

The key to the successful implementation of a field development project lies in the understanding and management of the reservoir interfaces. Technip has developed various interfaces which are optimised in an integrated, interactive and iterative manner.

**Key issues**

- Reserve ranges, reserve distribution and number of wells
- Production profiles
- Composition of well fluids (GOR / GLR, H2S, CO2)
- Product specifications
- Understanding of the existing infrastructure
- Site, environmental and geo-technical data
- Environmental regulations, safety related issues

**Flow assurance and pipelines**

- Hydrate studies to develop hydrate control and prevention & mitigation programme
- Flow assurance studies of offshore and onshore pipeline networks
- Surge and slug force analysis of pipeline systems
- Pipeline route selection and cross-country pipeline engineering

**Key project details**

- **HOEC**: Onshore Gas Processing Facility Project on turnkey basis (including Basic Engineering & FEED).
- **ONGC (through Hal Offshore)**: Engineering services for replacement of (Instruments & Utility Gas) skids at 13 platforms.
- **ONGC (through Sarku Engineering)**: Engineering survey and design package for Revamp of 26 Well Platforms.
- **Cairn Energy**, Various concept studies/FEED

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6 Technip KT India Ltd.
Pumping and compressor stations
- Pumping stations involving transportation and handling of waxy crude oils, pig receiving / launching, metering and SCADA systems and pressure reducing stations
- Compressor stations involving transportation and handling of natural gas, pig receiving / launching, condensate handling, metering and SCADA systems

Crude oil stabilisation (Group Gathering Stations, central processing facilities & central tank farm)
- Crude receiving facilities
- Bath heaters
- Crude dehydration facilities (FWKOD, heater treaters)
- Crude de-salting facilities
- Crude stabilisation system
- Crude storage tank farm and custody transfer
- Associate gas compression, treating and dispatch facilities
- LPG recovery system
- HL, LP and acid gas flare system

Natural gas processing plants
- Slug catching / receiving facilities
- Acid gas removal
- Gas dehydration
- Dew point depression
- Condensate stabilisation and fractionation
- LPG and C2 / C3 recovery
- Refrigeration system
- Sulphur recovery unit
- Utilities and offsite systems
- HP, LP and acid gas flare system

Gas treatment
Technip KT India has the know-how of all the natural gas treating processing currently available on the market and is, therefore, in a position to select the most suitable application to meet a client's specific requirement considering the following:
- Gas composition and battery limit conditions
- Gas throughput
- Sales gas specifications and battery limit conditions
- Partial pressures of H2S and CO2 and presence of impurities like mercury, mercaptans, carbon disulphide / Carbon disulphide
- C2, C3 recovery requirements
- Economy of the whole project
Technip KT India upholds its leadership in the heaters market by improving heater efficiency and meeting pollution control requirements.

Technip KT India has supplied heaters to the process industry for more than 40 years. We have gained valuable insight into the design/engineering, supply, construction and commissioning of process heaters of various sizes and applications. We have experience of full range of heaters from vertical cylindrical to box type to critical ones like steam-methane reformers.

Technip KT India utilises its proprietary know-how, coupled with a strong understanding of fluid dynamics. In addition, we have a strong mechanism to plough back the field experience during constructability reviews, which are conducted at various stages of design and engineering for new/revamp projects. Some of our key references are as follows:

**Refinery and Petrochemical Heaters**
- Crude
- Hydrotreaters
- Catalytic reforming
- Visbreaker
- Steam-methane reforming
- Ketene
- Steam super heater
- Vacuum
- Hydrocrackers
- Delayed coker
- Propane deasphalting
- EDC cracking
- Hot oil systems
- Naphtha vaporisers

**Capabilities**

**Process**
- Thermal design and simulation
- Heat recovery systems
- Energy efficiency improvement
- Instrumentation and control
- CFD analysis
- Basic and detailed design
- Commissioning

**Engineering**
- Basic and detailed design
- Refractory design and detailing
- Static calculations
- Pressure parts and coil support design
- Flexibility analysis
- Transportation and lifting lug design
- Modular design
- 3D modelling

**Supply**
- Worldwide procurement
- Fabrication of pressure parts and modules in own shop
- Modular supplies
- Logistics management

**Construction**
- Constructability reviews
- Experienced construction team
- Involvement right from design phase
- Quality field-work of coils
- Refractory application
Reference list of major fired heaters, reformers and energy conservation systems engineered or supplied by Technip KT India since 2000

<table>
<thead>
<tr>
<th>Client</th>
<th>Application</th>
<th>Heat duty (MMkCal/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPCL, Vizag</td>
<td>Reboiler/DHDT Heaters/Hydrogen Reformer (under execution)</td>
<td>19/24/79</td>
</tr>
<tr>
<td>Trust Chemicals</td>
<td>EDC crackers</td>
<td>9,213</td>
</tr>
<tr>
<td>KPL, Kochi</td>
<td>NHT/CCR</td>
<td>4.5/62.4</td>
</tr>
<tr>
<td>MRPL, Mangalore</td>
<td>CDU/VDU/DCU/PFCC</td>
<td>41/14.7/2 x 42.5/9.8</td>
</tr>
<tr>
<td>BORL, Bina</td>
<td>Hydrogen reformer</td>
<td>97</td>
</tr>
<tr>
<td>Essar Oil Limited, Gujarat</td>
<td>CDU/VDU Heaters</td>
<td>87 &amp; 50</td>
</tr>
<tr>
<td>Essar Oil Limited, Gujarat</td>
<td>Heaters for VGO – HDT Unit</td>
<td>19.3 x 2 &amp; 62.8</td>
</tr>
<tr>
<td>Essar Oil Limited, Gujarat</td>
<td>Heaters for DHDT Unit (Charge Heater &amp; Fractionator Reboiler)</td>
<td>16.5 &amp; 12.9</td>
</tr>
<tr>
<td>BORL, Bina</td>
<td>CDU/VDU Heaters</td>
<td>59 &amp; 39</td>
</tr>
<tr>
<td>IOCL, Panipat</td>
<td>CCRU Heater</td>
<td>52</td>
</tr>
<tr>
<td>KTI Corp., USA</td>
<td>Crude Oil Heater for Thai Oil</td>
<td>40</td>
</tr>
<tr>
<td>MRPL, Mangalore</td>
<td>Mixed Xylene Column Recovery Unit (includes Heater)</td>
<td>16</td>
</tr>
<tr>
<td>Technip, USA</td>
<td>Engineering and Reformer Supply for BAPCO, Bahrain</td>
<td>107</td>
</tr>
<tr>
<td>JGC Corporation, Japan</td>
<td>Engineering and Reformer Supply for Sohar Refinery, Oman</td>
<td>74</td>
</tr>
<tr>
<td>BPCL, Mumbai</td>
<td>CRU Heater</td>
<td>31</td>
</tr>
<tr>
<td>Technip Benelux BV, The Netherlands</td>
<td>Engineering for Hydrogen Reformer for Skan raff</td>
<td>70</td>
</tr>
<tr>
<td>KTI Corp., USA</td>
<td>Hot Oil Heater</td>
<td>34</td>
</tr>
<tr>
<td>Technip KTI SpA</td>
<td>Hydrogen Reformer for GTL, Qatar</td>
<td>53</td>
</tr>
<tr>
<td>Technip KTI SpA</td>
<td>Heaters for GTL, Qatar</td>
<td>126 &amp; 77</td>
</tr>
<tr>
<td>Technip Benelux BV, The Netherlands</td>
<td>Syn Gas Reformer for BASF in China</td>
<td>43</td>
</tr>
<tr>
<td>Daelim Industries, Korea</td>
<td>Naphtha Super Heater and DHDT Reactor Charge Heater for IOCL, Mathura</td>
<td>1.5 &amp; 11.5 respectively</td>
</tr>
<tr>
<td>IOCL, Mathura</td>
<td>Hydrogen Reformer</td>
<td>67</td>
</tr>
<tr>
<td>CPCL, Chennai (through M/s L&amp;T)</td>
<td>Hydrogen Reformer in Hydrogen Generation Unit</td>
<td>71.5</td>
</tr>
<tr>
<td>IOCL, Digboi</td>
<td>Reformer for H₂ plant</td>
<td>9</td>
</tr>
<tr>
<td>IOCL, Guwahati</td>
<td>DHDT Unit Heater</td>
<td>3</td>
</tr>
<tr>
<td>IOCL, Guwahati (through Technip Benelux B.V.)</td>
<td>Reformer for H₂ plant</td>
<td>11</td>
</tr>
<tr>
<td>IOCL, Guwahati</td>
<td>Delayed Coking Furnace</td>
<td>20</td>
</tr>
<tr>
<td>HPCL, Vizag</td>
<td>Reformer for DHDS Project</td>
<td>24</td>
</tr>
</tbody>
</table>
Technip offers its well known and widely proven technology for industry's hydrogen needs and has been consistently recognised as the market leader in this field over the past decade. As part of the Technip group, Technip KT India brings this strength to Indian customers.

Technip has provided more than 240 hydrogen units worldwide, with plant installations ranging from the world’s smallest (1 tube) to the world's largest (640 tubes) steam reformers. Technip capability range from feasibility studies to lump sum turnkey project execution with a single source responsibility. It has an impressive reference base for various types of revamps, retrofits and midlife expansion/modernisation projects.

**Advanced process control**

Based on customers’ needs, Technip plants are provided with varying levels of control from simple keyboard operation to fully automated and computerised control, irrespective of the process configuration and mode of operation.

**Feed-fuel flexibility**

Over the life span of a plant, the economics or availability of a certain feedstock or fuel may change considerably. Technip has passed on the benefits of advancements in catalysts and burners to its customers in the form of flexibility in feedstock or fuel. Advanced controls for automatic changeover, without affecting the production capacity, can be integrated based on client’s requirements.

**Safety and environment protection**

Safety in design is a built-in feature of Technip plants that entails scrutiny of several engineering aspects such as material integrity assessment, detailed stress analysis of critical parts, impact of transient conditions, operation interlocks, plant layout and safety systems.

With focus on minimising the impact on environment, design measures are incorporated to ensure strict compliance with client requirements and statutory regulations. Incorporation of low NOx burners, SCR units and feed gas saturators, has mitigated concerns on account of flue gases and process condensate.

**Technip’s milestones in hydrogen plants**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969</td>
<td>First to incorporate PSA H2 technology</td>
</tr>
<tr>
<td>1970</td>
<td>First to employ pre-reforming (CRG) for syngas</td>
</tr>
<tr>
<td>1981</td>
<td>Amongst the first to apply SCR deNOx technology</td>
</tr>
<tr>
<td>1985</td>
<td>First to apply very low automatic turn-down (15%)</td>
</tr>
<tr>
<td>1992</td>
<td>Global alliance with Air Products for H2 supply</td>
</tr>
<tr>
<td>1997</td>
<td>Built the largest single-stream H2 plant (111,000 Nm3/hr) on multiple feeds</td>
</tr>
<tr>
<td>1997</td>
<td>First to apply automatic feedstock flexibility without H2 loss (NG, LPC, Naphtha)</td>
</tr>
<tr>
<td>1997</td>
<td>Largest Hybrid (PSA + Cold-box) H2 recovery plant</td>
</tr>
<tr>
<td>1998</td>
<td>Co-production of CO2 with Hydrogen</td>
</tr>
<tr>
<td>1998</td>
<td>Amongst the firsts to integrate H2 recovery and H2 generation</td>
</tr>
<tr>
<td>1998</td>
<td>Among the first to apply O2 blown secondary reforming</td>
</tr>
<tr>
<td>1999</td>
<td>First to apply Recuperative (post) reformer (EHTR) retrofit</td>
</tr>
<tr>
<td>2000</td>
<td>Largest single - streamplant (200 mmscfd H2)</td>
</tr>
<tr>
<td>2001</td>
<td>GTE integration with large SMR (power + steam)</td>
</tr>
<tr>
<td>2003</td>
<td>Feed Saturator in a new hydrogen plant</td>
</tr>
<tr>
<td>2006</td>
<td>GTE extended (combined) cycle with large H2</td>
</tr>
</tbody>
</table>
Technip KT India Ltd.

Conceptual Design, Basic Engineering

Operational Services & Feed-Back

Detailed Engineering & Design

Procurement Construction Start-up

Technip KT India offers the following services:

Services provided

- Hydrogen management studies
- Basic design and licensing packages
- Detailed engineering and supply:
  - Reformer package
  - Complete plant
- Construction, start-up and operation services
- Construction supervision / Management services
  - Commissioning and start-up services
  - Operator training services
  - Maintenance contracts

Reformer design considerations

- Process considerations
  - Codes and standards
  - Design margins
  - Flue gas NOx, SOx, CO

- HSE aspects
  - Safety

- Operational aspects
  - Feed flexibility
  - Reforming severity
  - Export steam
  - Thermal efficiency

  - Start-up / Shut-down
  - Feed change-over
  - Turn-down
  - Catalyst life

- Economic parameters
  - Net operating cost
  - Payback criterion
  - Level of reliability

The complete capability

Hydrogen plants in India engineered by Technip KT India with Technip technology

<table>
<thead>
<tr>
<th>Customer</th>
<th>Capacity, T/Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>BORL, Bina</td>
<td>77,000</td>
</tr>
<tr>
<td>BRPL, Bongaigaon</td>
<td>25,000</td>
</tr>
<tr>
<td>IOCL, Haldia</td>
<td>75,000</td>
</tr>
<tr>
<td>IOCL, Mathura</td>
<td>60,000</td>
</tr>
<tr>
<td>CPCL, Chennai</td>
<td>56,000</td>
</tr>
<tr>
<td>IOCL, Digboi</td>
<td>7,000</td>
</tr>
<tr>
<td>IOCL, Guwahati</td>
<td>10,000</td>
</tr>
<tr>
<td>HPCL, Vizag</td>
<td>18,000</td>
</tr>
<tr>
<td>KRL, Kochi</td>
<td>18,000</td>
</tr>
<tr>
<td>CPCL, Chennai</td>
<td>17,000</td>
</tr>
<tr>
<td>MRPL, Mangalore (2 phases)</td>
<td>34,000 x 2</td>
</tr>
<tr>
<td>HPCL, Mumbai</td>
<td>7,000</td>
</tr>
<tr>
<td>HOCL</td>
<td>1,100</td>
</tr>
<tr>
<td>HPCL, Vizag (under execution)</td>
<td>36,000</td>
</tr>
</tbody>
</table>