

INTEGRATED SOLUTIONS

for the Hydrocarbon Industry



L&T Energy
Hydrocarbon

About Us

Larsen & Toubro Limited (L&T) is an Indian multinational engaged in EPC Projects, Hi-Tech Manufacturing and Services. A strong, customer-focused approach and the constant quest for top-class quality have enabled L&T to attain and sustain leadership in its major lines of business for eight decades.

Hydrocarbon Division under L&T's Energy portfolio undertakes engineering, procurement, fabrication, construction, and project management providing integrated 'design to build' solutions to large and complex offshore and onshore hydrocarbon projects globally.

More than three decades of rich experience in the hydrocarbon segment are backed by Division's extensive capabilities across the value chain and a range of offerings that ensure demonstrable value for customers. Employing digitalization and cutting-edge innovation, it delivers technologically superior solutions at every phase of project execution. Reliability and on-time delivery are ensured by adhering to global quality norms and the most stringent of HSE standards.

Conscious of our larger responsibilities as a corporate citizen, we are committed to the development of the communities around our facilities and project sites.

MISSION

Execution Par Excellence

We are committed to evolving into a major Indian multinational, occupying leadership position in the hydrocarbon industry.


Our people are our prime movers. We practise collaborative team-working with zeal, responsiveness and a sense of urgency. We encourage our personnel to demonstrate an entrepreneurial spirit and assume ownership for their actions.

We believe in an ethical work culture, with emphasis on governance in all business dealings. Our endeavour is to practise the highest levels of Quality, Health, Safety, Environmental and Information Security in all our operations.

Our focus is on sustainable value creation for all our stakeholders. We are passionate about our performance culture and committed to delivering excellence at every phase of our operations.

Subramanian Sarma
Whole-time Director (Energy), L&T

Date: 1st May, 2022



Business Verticals

Offshore	Onshore	Modular Fabrication	Construction Services	Offshore Wind Farm
<ul style="list-style-type: none"> Process Complexes and Wellhead Platforms Gas Compression Modules Subsea Pipelines & Systems Brownfield & Upgration Living Quarters Platforms FPSO Modules & Jack-up Rigs Decommissioning Solutions Deepwater Subsea Manifolds & Structures Transportation & Installation Services 	<ul style="list-style-type: none"> Upstream Oil & Gas Processing & Treatment Facilities Petroleum Refining Fertiliser Petrochemicals Cross-country Pipelines & Terminals Cryogenic Storage Tanks & Terminals Coal / Pet-coke Gasification 	<ul style="list-style-type: none"> Offshore Structures and Modules for Oil & Gas and Offshore Wind Farm Projects MOPUs Jack-up Rigs Deepwater Subsea Structures Process and Piperack Modules Onshore Structures & Modules LNG Modules Modular Speciality Furnaces Refinery & Petrochemical Plant Equipment E-Houses 	<ul style="list-style-type: none"> Pile Foundations Complete Civil & Structural Work including Precasting Plant & Non-plant Buildings including Precast Buildings Piping & Mechanical Works including Modular Construction / Erection Complete Electrical & Instrumentation Works Tankages including LNG Tanks Cross-country & Field Development Pipelines 	<ul style="list-style-type: none"> HVAC Platforms HVDC Platforms WTG Foundations

AdVENT

- Integrated Modular Solutions
- Refinery Technology Solutions
- Subsustainable Waste to Energy Solutions
- EPC Project Solutions



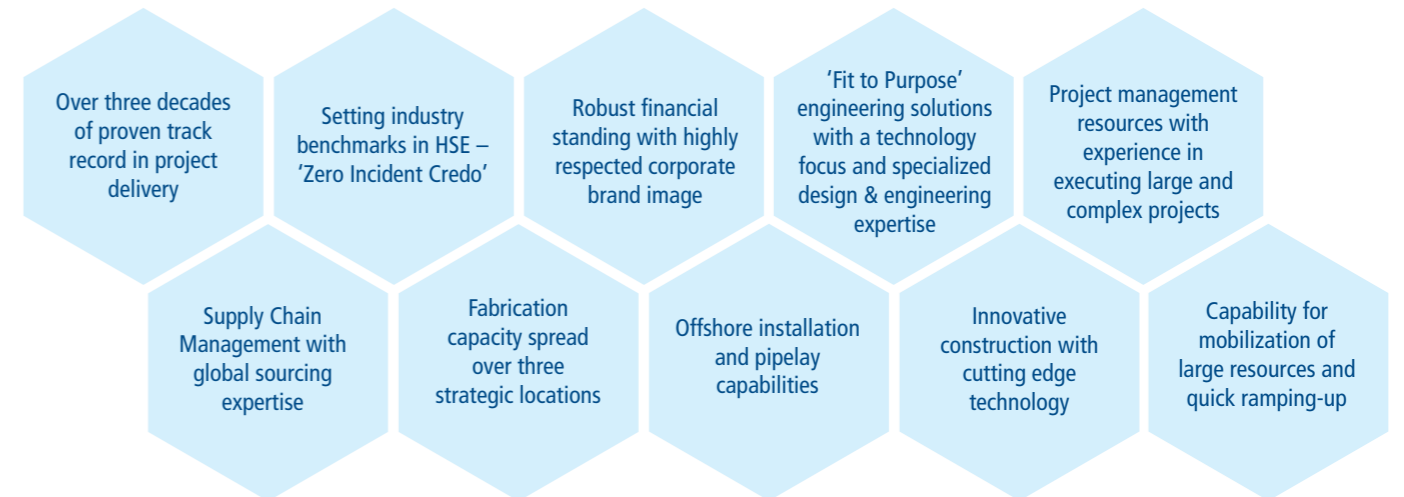
Asset Management (AM)

- AM Consulting
- AM Outsourcing
- Asset Integrity Services
- Asset Performance Management
- Specialized Services



Integrated Capabilities

As an Integrated solutions provider, we offer concept-to-commissioning solutions across the hydrocarbon value chain



In-house Capabilities: Engineering • Procurement • Fabrication • Construction • Installation • Commissioning • Start-Up

Operating Centres

- Jubail, Saudi Arabia**
Manufacturing Facility
- Vadodara, India**
Onshore Business
- Powai Campus, Mumbai**
Corporate HQ, Offshore, Modular Fabrication, AdVENT, Asset Management and OWF Businesses
- Chennai, India**
Construction Services
- Al-Khobar, Saudi Arabia**
IK EPC Centre
- Sharjah, UAE**
International Business HQ
- Sohar, Oman**
Modular Fabrication Yard and Equipment Fabrication Shop
- Hazira, India**
Modular Fabrication Facility
- Kattupalli, India**
Modular Fabrication Facility



Fully integrated, heaviest gas platform in Saudi Aramco's history, installed by float-over method at Hasbah Field in Saudi Arabia



New Water Injection South (NWIS - R) Project for ONGC



Mumbai High North Complex of ONGC, executed by L&T on an EPCIC basis. The massive complex comprises a 26,500 MT process platform, a living quarters platform and control room, three process gas compression platforms, two flare platforms and two jackets – including one weighing 13,500 tonnes



Umm Lulu & Nasr Field Development Phase 1 Project for ADMA-OPCO, UAE



DDW1 Wellhead Platform & Process-cum-living Quarters Platform for GSPC, installed off India's east coast

Offshore

We offer lump-sum turnkey v services encompassing the entire value chain – from oil and gas production to processing.

The range includes well-head platforms, process platforms and modules, subsea pipelines, brownfield developments, FPSO modules, decommissioning projects, offshore drilling rigs (upgrade and new build of jack-up rigs and conversion to EPS and MOPU), deepwater structures & manifolds, transportation & installation services.

Engineering

The Offshore Engineering Centre offers engineering solutions for wellhead platforms, process facilities, platforms, complexes, independent process and utility modules, FPSO topsides, riser and pipeline systems, jack-up rigs and MODU to MOPU conversions.

Engineering capabilities cover the project life cycle from Feasibility Studies, Concept, FEED, Detailed Engineering, 3D Modeling,

Special Studies including safety, risk assessment, pre-service engineering and commissioning assistance. Special analysis include Transient Flow Analysis, Dynamic Simulation, Non-linear Analysis (Wave Pushover Analysis, Time Domain Analysis for Rare Intensity Earthquakes, Boat Impact Analysis) using USFOS and Onbottom Roughness Analysis using SAGE.

Project Management

Project Management teams deliver large and complex offshore EPCIC projects of over USD 1 billion, meeting world-class HSE, quality and schedule requirements. Procurement teams ensure certainty and cost competitiveness of supplies through world-wide network of suppliers, efficient expediting and detailed planning.

Fabrication Facilities

Our three state-of-the-art modular fabrication facilities have a total annual capacity in excess of 200,000 MT. Two fabrication facilities in India (one on India's west coast at Hazira

near Surat in Gujarat, and the other on east coast at Kattupalli near Chennai in Tamil Nadu) and a yard at Sohar in Oman offer round-the-year delivery of process platforms, wellhead platforms, modular structures, heavy jackets and oil rigs.

Transportation & Installation Services

Our heavy-lift-cum-pipelay vessel - LTS 3000 - undertakes in-house installation of offshore platforms and pipelines. LTS 3000 has successfully installed over 120 offshore structures (jackets, topsides, etc.) and has laid more than 320 km of sub-sea pipelines (including piggyback pipelines) at various oil fields in India, Malaysia, Indonesia, Myanmar, Vietnam and the Middle East.

We also own and operate LTB 300, a state-of-the-art pipelay-cum-work barge built to suit Middle East, Indian and South East Asian conditions. The vessel has extensive experience of laying subsea pipelines in water depths ranging from 60 m to 90 m.

Clients

Our business is pre-qualified with and has executed projects for oil & gas majors including ONGC, Saudi Aramco, ADNOC Offshore, British Gas, Bundoq, Dragon Oil, GSPC, KJO, Maersk Oil Qatar, PETRONAS Carigali, PTTEP, QP, Songas, BHGE, Shell, Chevron, ExxonMobil, Total and Eni.

It is also included under Achilles JQS and FPAL as an EPC contractor in the North Sea.

We have recently executed Hasbah Gas Increment – II project for Saudi Aramco and are currently executing two more mega projects, viz., Marjan Increment Program Offshore Oil Package 2 and Zuluf North & South Water Injection Facilities affirming continued customer confidence.



Two Oil PDMs and Associated Facilities in Zuluf Field for Saudi Aramco



One of the 3 wellhead platforms of Bassein Development 3 Project for ONGC



Booster compressor platform with an interconnecting bridge executed for ONGC



One of the 4 Decks of SFNY-4D project installed in Safania Field for Saudi Aramco



Yetagun 'D' Platform installed offshore for PETRONAS Carigali



One of the 3 wellhead platforms of Zawtika Phase-1A Project, installed in Gulf of Mottama in Myanmar for PTTEPI



Marine services cover the entire spectrum of offshore installations - LTS 3000 (left), a heavy-lift-cum-pipelay vessel and LTB 300 (right), a pipelay-cum-work barge



ONGC's jack-up rig 'Sagar Uday' (BMC Class 300) involving major lay-up and repair

Track Record – Offshore



10 New Process Platforms



78 Wellhead Platforms



43 Wellhead Topsides



28 Wellhead Jackets



17 Gas Compression Modules



303 Platform Modifications



8 FPSO Topsides (Engineering)



1770+ km Subsea Pipelines



10 Living Quarters



2 Deepwater Projects



40,000 MTPA Melamine Plant for Gujarat State Fertilizers & Chemicals, Vadodara, India



Intigrated Ammonia-Urea Complex for Hindustan Urvarak Rasayan Limited, Barauni, India



48" x 118 km-long Crude Transit Line from North Kuwait to Central Mixing Manifold for KOC, on EPC basis



Mangalore Aromatic Complex for ONGC-Mangalore Petrochemicals Limited, India



Gathering Centre (GC 30) for Kuwait Oil Company (KOC)



Normal Paraffin & Derivative Complex for Farabi Petrochemicals at Yanbu, Saudi Arabia

Onshore

We have end-to-end capabilities in EPCC solutions for oil & gas and offers turnkey solutions across the hydrocarbon value chain covering refining, petrochemicals, fertiliser, oil & gas processing, cryogenic storage including LNG, and pipeline sectors.

The track record includes plants for upstream oil & gas processing, diesel hydrotreating, motor spirit quality upgradation, sulphur recovery, hydrogen generation, lube base oil, fluidised catalytic cracking, delayed coking, naphtha cracking and associated units, purified terephthalic acid, paraxylene, methanol, melamine, paraffin and linear alkyl benzene, synthesis gas generation, cryogenic storage terminals and cross-country pipelines.

The projects executed cover technologies from multiple process licensors, including UOP, Axens, Haldor Topsøe, CB&I Lummus, Black & Veatch, Ortloff, ExxonMobil, Merichem, Foster Wheeler, Casale, BOC Parsons, Invista and Davy Process Technologies.

Strategic alliances with internationally renowned companies complement capabilities in the fertiliser and cryogenic sector.

Engineering

Detailed engineering centres integrate in-house strengths in engineering, fabrication, modularisation and construction to provide efficient designs and engineered solutions for hydrocarbon process plants meeting the highest safety and quality requirements.

L&T Chiyoda – a joint venture with Chiyoda Corporation of Japan – offers design and engineering services for onshore hydrocarbon plants. L&T-GULF – a joint venture with GULF Interstate Engineering, Houston – offers engineering and consultancy services for onshore hydrocarbon pipeline projects and onshore oil & gas field development projects covering design and engineering services. Capabilities include feasibility studies, basic engineering, FEED,

detailed engineering, project management services, procurement assistance and related services. Our experienced professional engineers work on state-of-the-art tools and software like HYSIS, PDS, PDMS, SPPID, STAADPRO and TEKLA structures to address the complete spectrum of process and detailed engineering.

Project Management

From initial design, procurement, construction to final commissioning, our highly experienced and responsive teams are geared to respond to the requirements of customers in focused geographies.

Clients

We are pre-qualified with and have executed projects for major oil & gas companies including Petroleum Development Oman (PDO), Saudi Aramco, Kuwait Oil Company (KOC), ADNOC, SABIC,

BAPCO, Banagas, CHEMANOL, Farabi Petrochemicals, KNPC, PETRONAS, Pertamina, Sonatrach, SOCAR, etc.

Within India, our client base includes major national as well as private oil & gas, fertilizer, cryogenic storage including LNG and petrochemical producers, including IOCL, MRPL, OMPL, HPCL, HRRL, BPCL, RIL, HMEL, CPCL, NFL, GSFC, GNFC, HURL, RCF and Petronet LNG.

The business has consolidated its international presence with a mega order in Saudi Arabia from Saudi Aramco for setting up three Gas Compression plants of a capacity of 200 MMSCFD each as well as laying of 343 km gas transport pipeline between Jafurah Gas Plant and Juaymah Tank Farm.



INDMAX FCC Unit including LPG Treatment Facility for IOCL at Bongaigaon, India.



700 TPD Methanol & 100 TPD Carbon Monoxide Plant for Methanol Chemicals Company (Chemanol) at Al Jubail in Saudi Arabia.



Haliba Field Development Project for Al-Dhafa Petroleum Operations, Abu Dhabi, UAE



LNG Tanks under construction for Adani's Dhamra LNG Terminal, India



Export Gas Compression Facilities Upgrade Project for Dolphin Energy Limited, Qatar



Panoramic view of Saih Nihaydah Gas Compression Project (SNDC2) for Petroleum Development Oman (PDO). The Company has also built PDO's gas processing facilities at Lekhwair, Saih Rawal, Yibal and Kauthar in Oman



Naphtha Cracker & Associated Units for IOCL's Panipat Refinery, India

Track Record – Onshore

Petroleum Refining



50+ Refining Units
CDU/VDU, Hydrocracker, Diesel HDT, Hydrogen, Sulphur Recovery, MSQ Upgradation, Catalytic Reforming, Lube Base Oil, Coke Drum System, FCC, Vacuum Distillation, Solvent Dewaxing, etc.

Oil & Gas Processing



22 Oil & Gas Processing Facilities
Gas Field Development / Processing / Compression, Condensate Fractionation & Cryogenic Air Separation

Petrochemicals



2 Petrochemical Complexes
10 Petrochemical Units

Fertiliser



9 Ammonia and Syngas Projects

Cryogenic Storage Systems & Thermal Systems



10 Cryogenic Storage Systems
83 Cracking Furnaces & Reformers

Cross-country Pipelines & Terminals



7060+ km Cross-country Pipelines
10 Oil & Gas Terminals



The world's largest ethylene cracker (1.4 MMTPA) – one of multiple systems supplied, installed and pre-commissioned for Reliance's J3 Program, Jamnagar, India. This ethylene cracker is part of the ROGC (Refinery Off Gas Cracker), the heart of C2 Complex



Panoramic view of HREL Bhatinda Refinery, India. Scope included EPC of 2 x 44,000 MTPA Hydrogen Generation Units and mechanical construction of 7 processing units

Laying of the world's longest heated and insulated waxy crude oil pipeline in India from Barmer to Bhogat 24" x 619 km crude oil pipeline and 8" x 527 km natural gas pipeline

Construction Services

We undertake turnkey construction of refinery, petrochemical, chemical and fertilizer projects, gas-gathering stations, cross-country Oil & Gas pipelines and terminals, including storage tanks and underground cavern storage systems for LPG.

Technology & Capacity Building

We offer innovative construction solutions such as complete automated welding (Double sided tandem SAW for Horizontal joints and Semi-auto FCAW for vertical joints) & NDT (Automated UT) for LNG tank construction yielding high quality & productivity, enhancement of high deposition submerged arc welding process for duplex stainless-steel material in pipelines, new line of gas regulators for reduced gas wastage and automatic pipe fabrication shop with cutting edge technologies.

Expertise in Heavy Lifts

We have an in-house team to provide erection schemes for lifting all types of heavy and critical equipment, columns, reactors,

regenerators, absorbers, converters and heavy structures as preassembled modules, etc., with precision arrangements using heavy lift cranes, gantry arrangements and as well as tailor made lifting systems.

Equipment Fleet

A large asset-base of construction equipment includes heavy cranes up to 750 T capacity, pipe layers up to 110 T capacity, pipebending machines, major concreting equipment and related machinery.

Digital Transformation

We are geared up to invoke efficiency in terms of project time and resources through business process automation. In this mission, many critical processes like material status tracking, project planning (including special application for cross-country pipeline) progress monitoring, work face planning, work process improvements in field functions like scaffolding and Quality

Management through multiple stage gates and Performance monitoring of Supervision for HSE assurance have been digitalized.

Employment of VR technology for HSE training, a number of alert mechanisms to ensure safety in operations, speed control and wastage reductions by IIOT technology in connected equipment, digital induction & skill inventory of workmen, FR technology and digital health monitoring for all project personnel, drone based survey capability, AR for inspections are to mention a few of ever improving state-of-the-art technologies.

HSE Enhancement

We strongly believe that every incident is preventable, and the organization is committed, through its 'Zero Incident Credo', to providing a safe and healthy workplace. To achieve this, we have developed effective digital solutions to monitor health condition of all workmen using Digital Health Monitoring System, Virtual Reality based HSE Training modules, and a unique Digital tool

called Credibility System to track Unsafe Conditions and Acts along with the quantifying the Execution team's involvement in ensuring a safe working environment on site.

Our HSE Performance received many awards and accolades from esteemed customers like KOC, Saudi Aramco, PDO, HPCL, IOCL, Reliance as well as independent agencies like National Safety Council of India and international organizations like ASSP and ROSPA for our best HSE practices and their implementation at our projects.

Track Record and Client Base

Most projects executed by us are in excess of 10 million construction man-hours, with two projects in excess of 100 million construction man-hours. Landmark project includes construction of the world's largest refinery for RIL at Jamnagar, India, including its Phase-III petrochemical complex expansion. We were the single largest contributor in building the world's largest ethylene cracker



Mangala Process Terminal for Cairn Energy India Limited at Barmer in Rajasthan, India



Group Gathering Station-11 for RIL's Coal Bed Methane Field Development Project, Shahdol, Madhya Pradesh



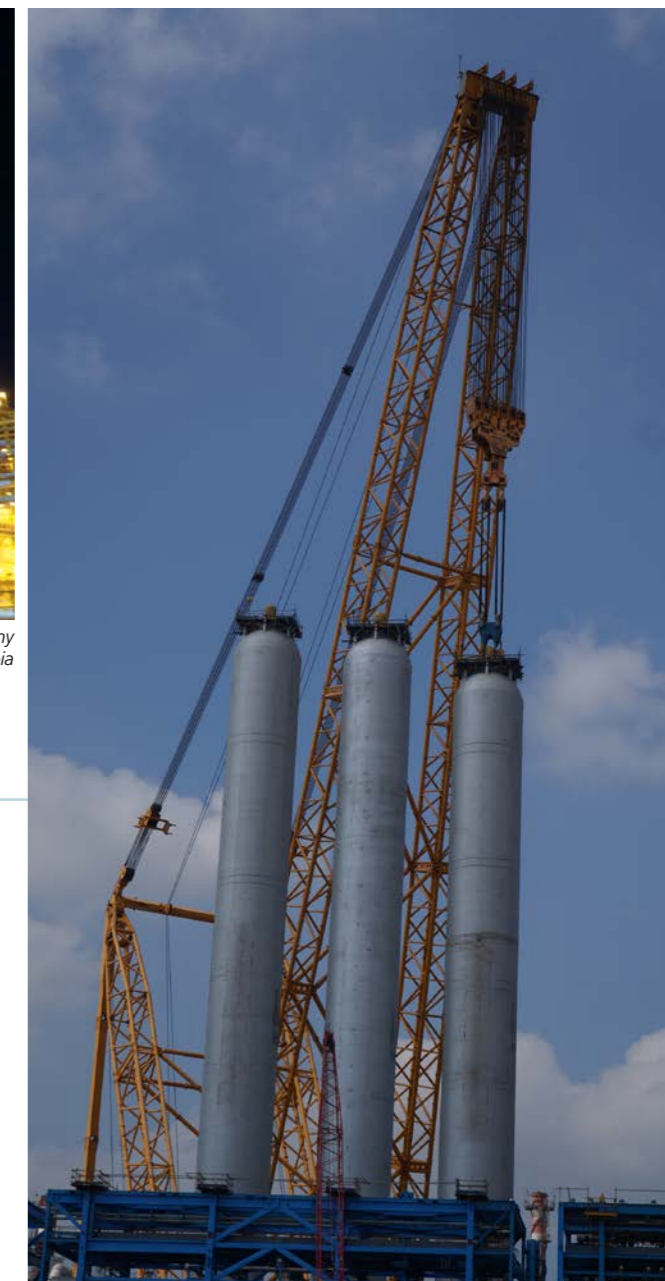
Cairn Mangala Upgradation Facility – II project, Barmer



Onshore Gas Terminal for Reliance Industries Limited at Kakinada, Andhra Pradesh, India



Solution Polyethylene and Specialty Elastomers package for Sadara Chemical Company (JV of Saudi Aramco and Dow Chemicals) at Al Jubail, Saudi Arabia



Erection of world's heaviest LC MAX reactors at Residue Upgradation Facility for HPCL, Vizag

(ROGC- Refinery Off Gas Cracker) and other units such as pX-4 (para-Xylene), MEG (Mono Ethylene Glycol), LDPE (Low Density Polyethylene), ECS (Ethylene Cryogenic Storage) and PCG (Pet Coke Gasification) units. The ECS Project set a world record for the fastest completion (29 months).

The track record also includes mega onshore gas terminal at Kakinada for RIL and all major processing units of the Bathinda refinery for HMEL. For Cairn India, We built the world's longest heated and insulated waxy crude oil pipeline and India's largest onshore oil processing terminal at Barmer, Rajasthan. Another significant and critical achievement is the erection of the world's heaviest LC MAX Reactors (three in number weighing 2210 MT, 2115 MT and 2105 MT) at India's first Residue Upgradation Facility of HPCL Visakh Refinery Modernization Project (VRMP).

Our international track record includes cross-country pipelines for ADNOC Gas Processing, KOC & Saudi Aramco, Gas Compression

projects at various locations for PDO (viz. Lekhwair, Saih Rawl, Yibal, Saih Nihaydah and Kauther); Dolphin Energy Qatar; Gas Processing Facility for Saudi ARAMCO and polyethylene trains for SADARA Chemical Company, Gathering Centre for KOC and Haliba Onshore Field Development project for Al Dhafra Petroleum (an ADNOC Subsidiary) and n-Paraffin and Derivative complex for Farabi Petrochemicals at Yanbu.

Major projects under execution include construction of three central processing facilities for Sonatrach – Algeria, Petrochemical Fluidized Catalytic Cracking Unit (PFCCU) & Propylene Recovery Unit (PRU) for HRRL – Barmer, Dual Feed Cracker Block for HRRL – Barmer, Residue Upgradation facility for HPCL – Vizag, 24" x 224 KM of Mumbai Nagpur Pipeline for GAIL and Jafurah Gas Compression Facilities and Cross-country Pipeline for Saudi Aramco.

Our client base comprises several industry majors:

India: RIL, HMEL, IOCL, BPCL, HPCL, ONGC, Cairn Energy, MRPL, NFL, RCF, GNFC, GSFC, GAIL, GSPL, GIGL, HURL, etc.

International: Saudi Aramco, Sadara, SATORP, Farabi Petrochemicals, ADNOC Gas Processing, ADNOC Onshore, SONATRACH, ADNOC Refining, ADNOC LNG, ADNOC Sour Gas, BOROUGE, ENOC, KNPC, KOC, KAFCO, QP, Dolphin Energy, PDO, OGC, Air Products, Oiltanking Odfjell Terminals & Co. LLC, etc.



Total Area 500,000 m²

Modular Fabrication Facility at Hazira, India



Total Area 700,000 m²

Modular Fabrication Yard at Sohar, Oman



Two mega tie-in platforms (7000 MT each) for Saudi Aramco under fabrication at Oman Facility



Total Area 600,000 m²

Modular Fabrication Facility at Kattupalli, India



Manufacturing Facility at Jubail, Saudi Arabia

Modular Fabrication

We offer comprehensive Modular Engineering, Procurement & Fabrication solutions for offshore and onshore projects, primarily in the oil & gas sector, including fabrication and supply of modules and static equipment for the offshore oil & gas fields, refineries, petrochemical plants and fertilizer complexes. We are equipped to supply foundations and substation modules for Offshore Wind Farm projects.

Our world-class Modular Fabrication Facilities, with an annual fabrication capacity exceeding 200,000 MT, are strategically located at Hazira (Surat) on India's west coast, Kattupalli (Chennai) on India's east coast, and Sohar in Oman. Piping shop and the proposed heavy-wall pressure vessel manufacturing shop in Saudi Arabia will cater to the local market.

Each of these locations was selected for its proximity to major oil and gas fields and allied maritime infrastructure. These Modular Fabrication Facilities offer year-round and on-time delivery with robust QHSE performance and zero punch list. They are equipped with state-of-the-art infrastructure and machinery for

operational and logistical flexibility, project management and cost competitiveness, and are backed by automation & digitalisation in the manufacturing process.

All the three Modular Fabrication Facilities are situated on the waterfront with easy access to clients across the globe and have load-out jetties suitable for dispatch of large and heavy modules via ocean-going vessels and barges. The Company's modular solutions are a unique combination of Modular Fabrication Facilities backed by rich and extensive experience of project Engineering, Procurement and Installation / Construction, Testing and Commissioning (EPIC/EPCC) in both Offshore and Onshore domains.

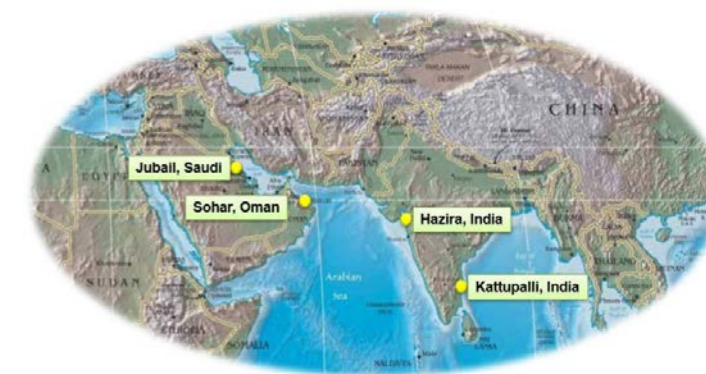
These Modular Fabrication Facilities are accredited with global certifications and pre-qualifications from all major oil & gas customers. They are equipped to deliver complex modules, duly tested / pre-commissioned prior to delivery.

With ASME S, U, U2, R and NB Stamps as well as API 2B approvals

under their belt, these facilities also deliver static equipment like reactors, pressure vessels, columns and heat exchangers for refineries, petrochemicals, fertilizer projects and other process industries. They function as a one-stop solution for module fabrication requirements.

The modular solutions harness the extensive experience of the Company's Engineering Services, covering the entire spectrum engineering from concept to commissioning in oil & gas as well as load-out and transportation analysis.

In addition to clients from Offshore and Onshore EPC, direct clients and end-users include Petrofac, ADNOC Offshore, PDO, KOC, RIL, Fluor, KNPC, SASOL, Hyundai Saipem JV, Linde Engineering, JNK Heaters, B&V, TechnipFMC, Air Products and UOP, etc. The Company was awarded a breakthrough contract for Process Modules (PAU) and Piperack Modules (PAR) for a process plant for an international project and is set to be executed at the Modular Fabrication Facility at Kattupalli.



Total Annual Fabrication Capacity: 200,000+ MT



Onshore Process and Pipe Rack Modules being readied at MFF-Kattupalli



Deepwater Manifold Module for ONGC's KG-DWN-98/2 Project, Offshore India East Coast



Onshore PAU & PAR Modules for Clean Fuels Project, Thailand



Redefining the assembly lines at MFY, Sohar - Successfully delivered multiple jackets for Saudi Arabian waters

Capability Spectrum – Modular Fabrication Solutions

Onshore



Piperack Modules (PAR)



Manifold Modules (PAM)



Process Modules (PAU)



Modular Reformers, Cracking Furnaces & Heaters



Modular CCR Projects



Equipment and Skids

Offshore



Platforms



Living Quarter Modules & E-Houses



Compressor Modules



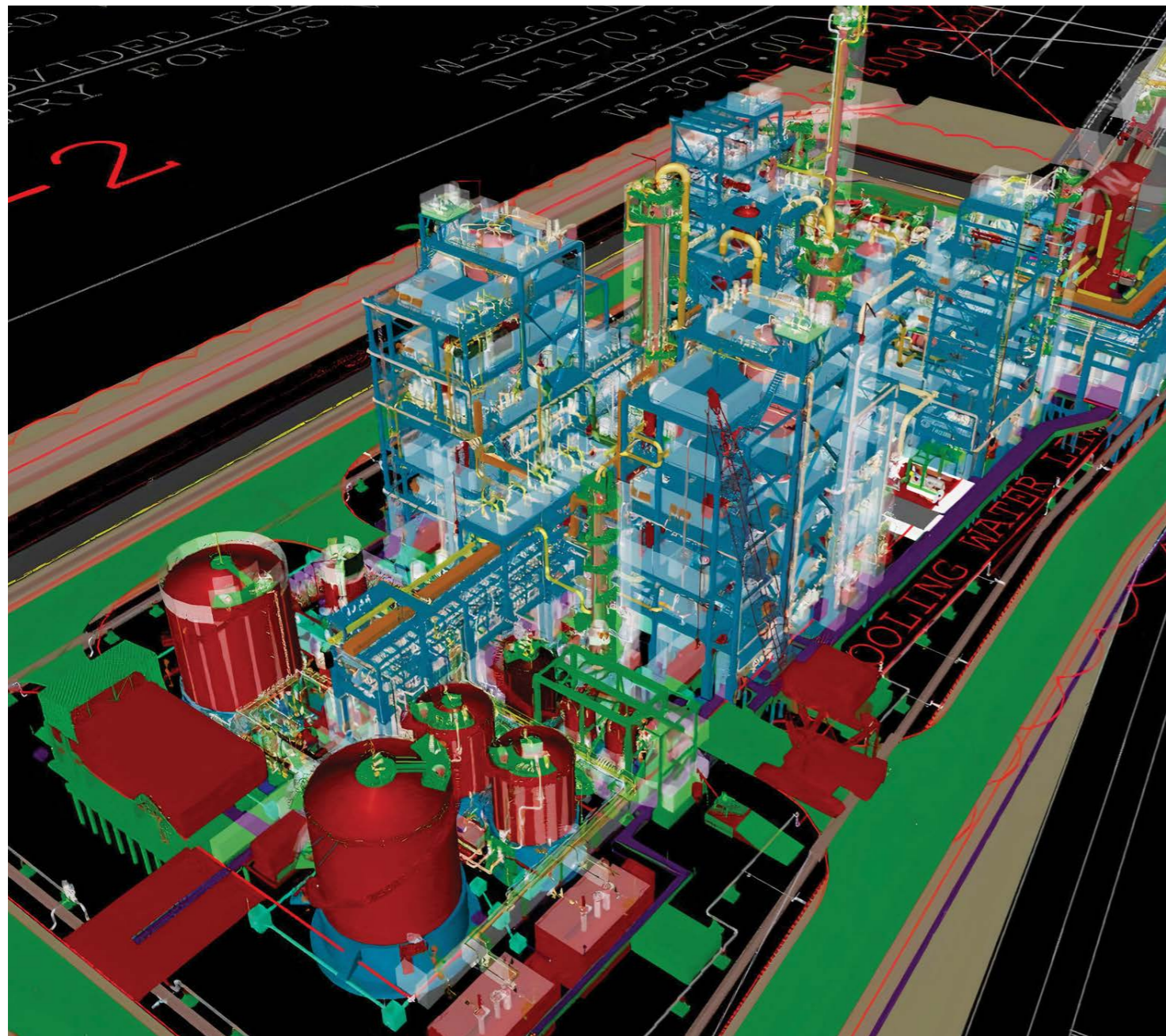
Jack-up Rigs



Jackets



Bridges



3G Ethanol CAD Model for IOCL, Panipat, India



Integrated Module for FPDO Topside - H₂S Management System

AdVENT (Advanced Value Engineering & Technology)

AdVENT adds new dimensions in the arenas of Modular Solutions, Cutting-edge Hydrocarbon Technologies, Hydrocarbon and Speciality Chemical Industry.

Leveraging our expertise in high-end engineering and execution of large-scale, technologically complex EPC projects over several decades and collaborating with esteemed R&D centres and renowned institutions AdVENT strives to deliver comprehensive customer-centric solutions for the entire value chain of the Hydrocarbon industry and emerging industries for the future. AdVENT's technical capabilities and agility enable it to offer associated tailored value engineering solutions.

AdVENT's offerings to clients encompass Design & Engineering, Co-development and Commercialization of Technologies, end-to-end Project Management, Strategic Projects Delivery, and Integrated Modular Solutions.

Integrated Modular Solutions

We provide bespoke Modularization Solutions from conceptualization & engineering to fabrication, transportation, and installation on a single-point responsibility basis to truly deliver the benefits of modularization.

AdVENT has developed expertise in modular engineering of process units for Hydrocarbon applications to deliver cost and time-efficient projects. Our solutions offer flexibility in schedule to align with construction and concurrent fabrication, while providing customized solutions especially for revamp projects.

Refinery Technologies Solutions

AdVENT offers cutting edge Refinery Technologies in collaboration with prime technology suppliers/licensors, enabling Modular solutions. Our experience in various process technologies makes us a preferred partner for leading process licensors.

Sustainable Waste to Energy Solutions

The energy landscape is fast changing because of increasing focus on alternative sources/methods for generation and consumption of energy, environmental concerns, utilization, and recycling of natural resources. AdVENT is collaboratively participating in technology areas to offer end-to-end solutions in the wide emerging sector to address our customer needs.

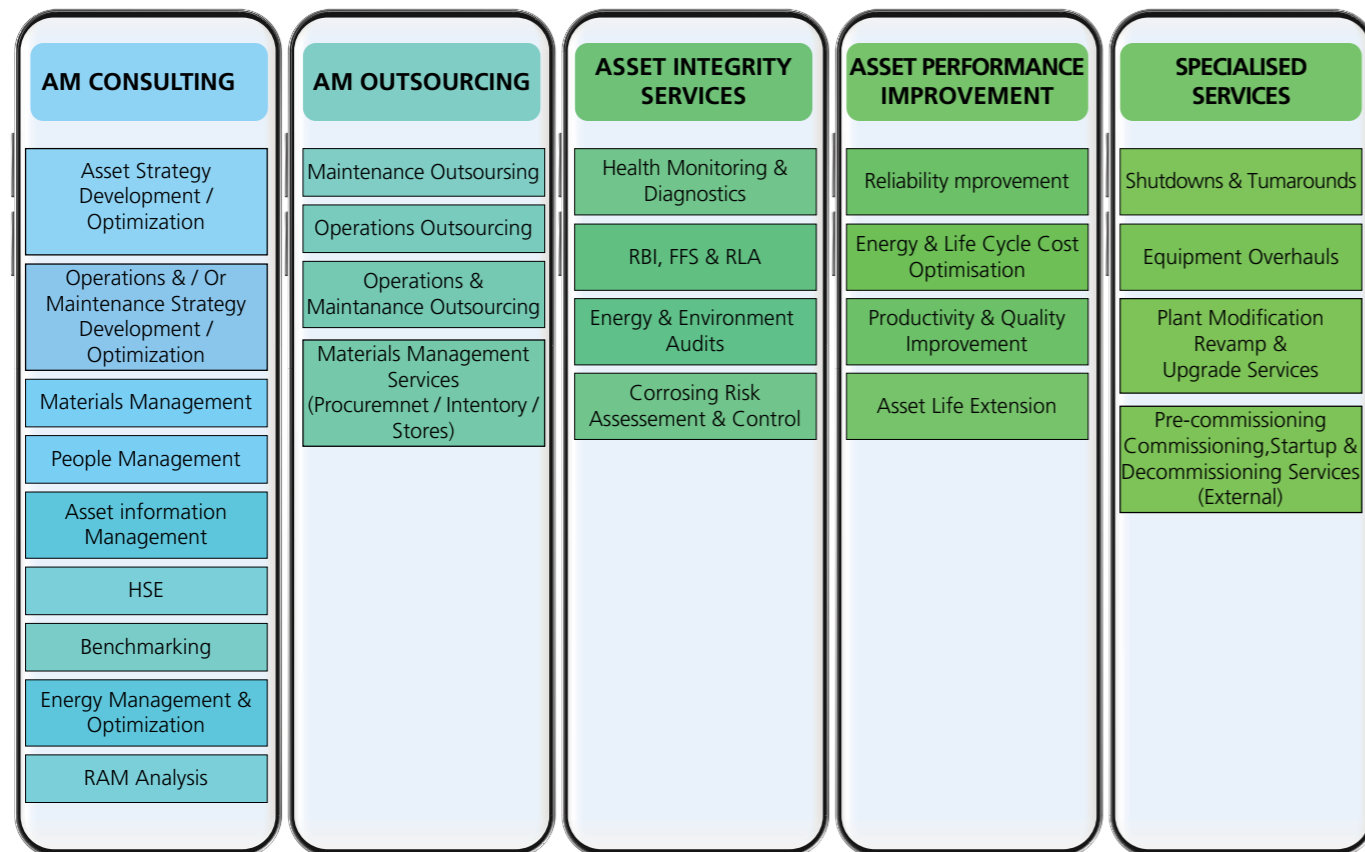
EPC Project Solutions

AdVENT is focussed on servicing its valued customers by providing end-to-end turnkey EPC solutions in association with global technology partners.



Modular SRT-III Ethylene Cracking Furnace for IOCL Panipat, India

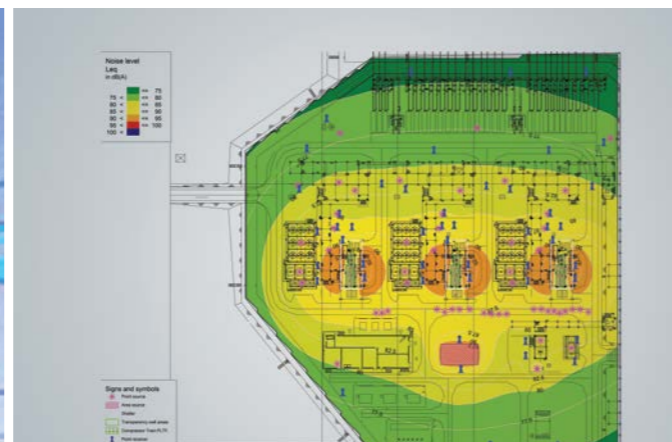
Asset Management



Comprehensive Asset Management Solutions for Hydrocarbon and Process Industries



Flare Radiation and Dispersion Analysis



Plant Noise Mapping Study

Our Asset Management (AM) business delivers differentiated and value-adding services across a wide spectrum of solutions to Hydrocarbon and allied Process Industries. These comprehensive Asset Management solutions extend the organization's design, engineering, construction and commissioning capabilities to cover operation, maintenance, performance enhancement and health assessment of critical assets. Thus, the business complements the organization's EPC Project offerings for mutually beneficial engagement with Clients over the entire lifecycle of assets

The Asset Management portfolio covers the following key offerings, aimed at meeting the needs and aspirations of Asset Owners.

- Asset Management Consulting
- Asset Management (Operation & Maintenance) Outsourcing
- Asset Integrity Services

- Asset Performance Improvement
- Specialized Services

The Asset Management portfolio provides a holistic approach to the solution delivery model and is built based on three key differentiators, namely,

- Comprehensive and Cohesive Processes
- Robust Competence Assurance Plan
- Appropriate Digital Enablement

All key functions of the business, from customer engagement to solution development to delivery, are based on the theme of continual improvement through the Plan-Do-Check-Act (PDCA) philosophy. The Asset Management team presents a unique blend of rich domain expertise and relevant industry experience across diverse sectors to meet and surpass customer expectations.

Offshore Wind Farm

The global offshore wind market is poised to play a central role in transitioning to a net zero and in decarbonizing the energy sector. We are committed to play a significant role as an EPCIC player by joining hands with Offshore Wind stakeholders across the globe.

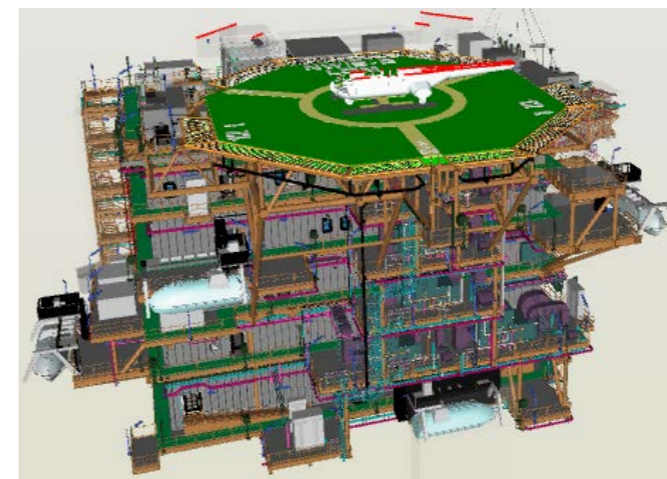


Offshore Substation Platform

A rich experience of over 3 decades in offshore EPC Oil & Gas sector, enables us to draw expertise for giving comprehensive solutions, backed by strong project management and engineering teams, fabrication facilities and state-of-art offshore construction vessels. Our OWF offerings include:

- HVAC Offshore Substation Platforms
- HVDC Offshore Substation Platforms
- Wind Turbine Generator Foundations

Engineering capabilities cover the project life cycle from Feasibility Studies, Concept, FEED, Detailed Engineering, 3D Modelling and Special analysis including Non-linear Analysis (Wave Pushover Analysis, Time Domain Analysis for Rare Intensity Earthquakes, Boat Impact Analysis) using USFOS.



3D Model of a LQ Module

Our fabrication facilities have an annual capacity in excess of 200,000 MT. Two facilities in India (one on India's west coast at Hazira in Gujarat and one on India's east coast at Kattupalli in Tamil Nadu) and one facility at Sohar in Oman, provide a strategic advantage to support projects in both EMEA as well as APAC regions. High capacity load-out jetties enable an advantage for large structures for Offshore Substations (OSS).



Jacket Assembly Lines at MFY Sohar, Oman

Our captive heavy lift vessels LTS3000 and LTB300 have been consistently performing installations in India and Southeast Asia.



In-house Installation Capability (LTS 3000)

We take pride in ensuring high quality standards with focus on environment, best in class HSE and Social Accountability practices, on-time delivery with zero punch points, cost competitiveness, implementation of digital systems and IT security practices.

Our long association with strategic partners across the globe enables us to meet local requirements and project specific stipulations, along with technology tieups for floating structures and other emerging technologies.

We have been engaging with Clients and other Stakeholders during concept stage to co-create innovative & holistic solutions to support their specific needs in the changing energy sector.

We have been pre-qualified by major European Windfarm Developers/TSOs for EPCIC of Offshore Substations and WTG projects like TenneT, EnBW and are actively engaging with prospective clients in other regions.

Health, Safety & Environment (HSE)

No Personal Injuries

No work related ill-health

No occupational accidents & material damage

No harm to environment

ZERO INCIDENT CREDO

Safety as a Core value

We believe that every incident is preventable. Our "Zero Incident Credo" implies that we are committed to providing a safe and healthy workplace without adversely affecting the environment.

HSE is our core value which is reflected in our commitment to consistently improve HSE performance by conducting our activities in a manner that ensures the health and safety of our people and those involved directly or indirectly in our operations. Our HSE Management System (HSEMS) outlines the structured approach necessary for all our operations to manage HSE risks and drive HSE improvement in a consistent and systematic manner. Our HSE Management system is certified for ISO14001:2015 (EMS) and ISO 45001:2018 (OHSMS) standards.

- Numerous awards and accolades from national and international agencies affirm our excellence in HSE. Few among them are:
- ASSP (American Society of Safety Professionals) - India Chapter HSE Excellence award 2022
 - CII (Confederation of Indian Industries) Winner Award 2021 for "Best Practices in Occupational Health and Safety"
 - CII EHS Excellence Award 2021 for HPCL Vizag Projects
 - ASSE (American Society of Safety Engineers) GCC Excellence Awards 2021 for KOC Projects
 - Energy and Environment Foundation Global Environment Award 2020
 - ICC (Indian Chamber of Commerce) National Winner Platinum Award for Occupational Health and Safety 2020

GOLDEN SAFETY RULES

- Adhere to PTW (Permit to Work), never operate or interfere with equipment without authorization
- Adhere to applicable Personal Protective Equipment (PPE) rules
- Protect yourself against a fall when working at height
- Use adequate PFD (Personal Flotation Devices) like life jacket, work vest etc. while working over water
- Always report unsafe act/unsafe condition, injuries and incidents promptly, do not walk past it
- Do not drive vehicle without wearing seat belt
- Do not walk or position yourself under a suspended load
- Do not use mobile phone and exceed speed limit while driving
- Do not consume alcohol or drugs while working or driving
- Do not smoke in prohibited areas

HSE Awards



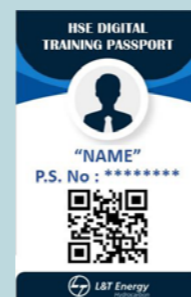
Online Vehicle Monitoring and Fleet Management



E – PTW Portal



Virtual Reality based HSE Trainings



HSE E-Passport: A QR based smart card with training information

Digitalisation Revolutionizes Project Performance and Delivery

We have implemented an Integrated, IT-enabled Project Management suite of applications in sync with several other digitalization initiatives. This enhances its ability to deliver projects on time and within budget, while conforming to international safety standards.

The Integrated Project Management System 'EPSILON' is a comprehensive data management system that sources information from various transaction applications and provides a collaborative space for all project stakeholders to interact around a 3D-model based integrated workspace wherein project teams can plan together, share and view project progress, updates, manage changes and minimize risks. This well-connected information network is the foundation for business intelligence, analytics, and knowledge management.

Epsilon also provides a platform for 4D progress visualization and workfront forecasts superimposed on 3D model, thus facilitating informed decision making through "Project Digital Twin". Immersive 3D walkthrough using VR technology are enabled for efficient design, constructability and operability reviews.

Epsilon connects to Primavera the project schedule engine, SAPERP the backbone of commercial transactions and with in-house transaction system developed on is Microsoft SharePoint and cloud technologies. The client, suppliers and PMC also participate in the relevant workflows.

Engineering teams use the latest 3D CAD/ CAE software suites to generate an integrated plant model (PDS/PDMS/E3D/SP3D, as per the client's preference). A highly evolved enterprise-wide unified material codification system 'mCode' bridges the 3D virtual plant with a SAP-based ERP system. Project material take-offs from the 3D system are thus converted into error-free purchase orders and integrated into material tracking systems.

e-Procurement automates purchasing systems and effectively controls delivery schedules, cost and quality of procurement. It includes SAP ARIBA and other MOSS-based programs developed in-house for Vendor Documentation Management (VDMS). SAP ARIBA allows shortlisted vendors to participate in virtual negotiation over the Internet, which facilitate securing the best terms and deliveries. SAP Business Warehouse (BW),

a business-intelligence online analytical processing software, increases flexibility in response to client requirements.

Other IT-enabled processes include an advanced Post Order Management System (POMS) that permits tracking of the physical progress of items at various stages of manufacture, and a GPS-based system for online tracking from source to final destination. Home grown system IMPACT forecasts the fabrication workfront based on material receipt and inventory at the project's stores. A digitalized material tracking application allows for QR/RFID based physical tracking of piping spools, reducing loss of time and material. Structural, E&I and loose-shipped material with packages follow similar systems and processes.

Construction management is enhanced with eALPS, a proprietary Web-enabled software, which micro-plans, tracks, controls and integrates activities across project sites, providing 'real time' status. Site supervisors update daily progress using mobile devices at individual-item level. This rolls up into the daily, weekly and monthly progress reports in a transparent, auditable manner. A Completion Management application manages project activity turnover and certification, monitors and closes out punch lists, generates certificates for completion, monitors real-time progress and generates system-wise completion dossiers.

In addition, RPA (Robotic Process Automation) is used across functions to automate mundane rules-based business processes, enabling business users to devote more time on value added work.

Latest 'Edge' applications are implemented across fabrication yards and construction sites to improve collaboration and productivity. Various technologies such as Augmented and Merged Reality offered by Smart AR Glasses and Helplighting are adopted for remote inspection & supervision. Other Video Analytics based applications help supervisors to track the safety and productivity of workers, plant and machinery using latest tech solutions including computer vision and machine learning.

An enterprise-wide knowledge management system 'DRISHTI' captures lessons learned and best practices across our projects and offers on demand situational guidance to project teams.

Proactive QHSE
Smart Alerts, e-Permit, e-Barricade

Smart Collaboration
Merged Reality, VR Walk-throughs

Integrated Systems
D-Twin: Primavera, SAP & In-house Apps

Connected Workplace
IIOT – Machines Workforce Skill App

Predictive Analytics
KM/ Data Analytics AI/ ML

Remote Inspection

Corporate Social Responsibility

Corporate Social Responsibility (CSR) at L&T Energy – Hydrocarbon (LTEH) is a true reflection of our purpose and mission to building a strong and vibrant India where everyone can enjoy the fruits of growth and prosperity, and no one is left on the margins of the society. In collaboration with NGO Partners and our own army of volunteers, the carefully designed interventions support communities near our campuses, office locations and project sites. For LTEH, CSR is an essential tool and not an afterthought plus driven by five key thrust areas that have made a discernible change in the lives of thousands across the country.

Educational interventions focus on factors such as lack of quality teachers, poor school infrastructure, absence of modern educational methodologies (such as science-based learning and STEM) and compensate for the gaps in our present educational setup. Interventions on **Health** maintain close co-ordination with civic facilities such as PHCs and local medical professionals in slums and villages across the country to provide effective, high-quality medical consultation and treatment either free or at a nominal cost facilitating access to medical care with dignity without having to worry about high out-of-pocket expenses.

Water initiatives are designed to ease the challenges about access to clean drinking water for thousands residing in drier parts of the country. Tied to our water availability initiatives are our Sanitation programmes under which we have built thousands of toilets for the rural masses.

As part of our CSR efforts, extra emphasis is given on **Environment** and related issues through several strategic interventions. Not only does this greenify our approach and lends us credibility but also helps push the case for restoring and preserving natural resources and maintaining a healthy environment for all. At the heart of our **Skill Building** interventions sits the idea of harnessing the unutilized energies of the youths from rural and smalltown

India. To these youngsters, we offer formal training in a variety of useful trades through NGO partners, government run facilities like ITIs and Community Skill Training centres which make them employable and contributing members of the society. Young girls and women form a key group of these interventions which are neatly designed to help them gain financial independence.

Employee volunteers called 'L&T-eers' play a crucial role in the success of each of our interventions. By **Volunteering** these passionate members of the L&T family devote their time and energy to helping our CSR programmes through their unique 'human-connect'.



Education Support Programme



Health Check-up



Tree Plantation Drive with L&T-eers



Aqua Tower installation by L&T

Corporate Sustainability

At L&T, Sustainability is embedded in the vision, culture, strategy and business processes. Our vision is to pursue eco-friendly growth, promoting a culture of sustainability and innovation, and thereby contribute towards a better world. L&T is also committed to seek sustainable growth by integrating Environment, Social and Governance (ESG) principles with its businesses. We strive to conserve natural resources, enhance social equity for sustainable growth, and foster a culture of trust, caring and continuous learning while meeting the expectations of all stakeholders. We believe in inclusive growth by protecting our environment, empowering our communities and accelerating development.

Over the years L&T has been focusing on ESG parameters such as climate stewardship, circular economy, green portfolio, green supply chain, employee and social welfare, workforce health & safety. In addition, L&T leverages its inherent strength and capabilities to implement sustainable CSR programmes towards 'Building India's Social Infrastructure'.

Commitments on Carbon and Water neutrality

Raising the bar to the next level, L&T is undertaking big goals related to Climate Change and Water Security and is aiming to achieve Carbon Neutrality by 2040, ahead of the Paris Agreement deadline of 2050, and Water Neutrality by 2035.



Commitment To Continuous Learning

L&T has set up a number of institutes around the country to impart technical and managerial training.



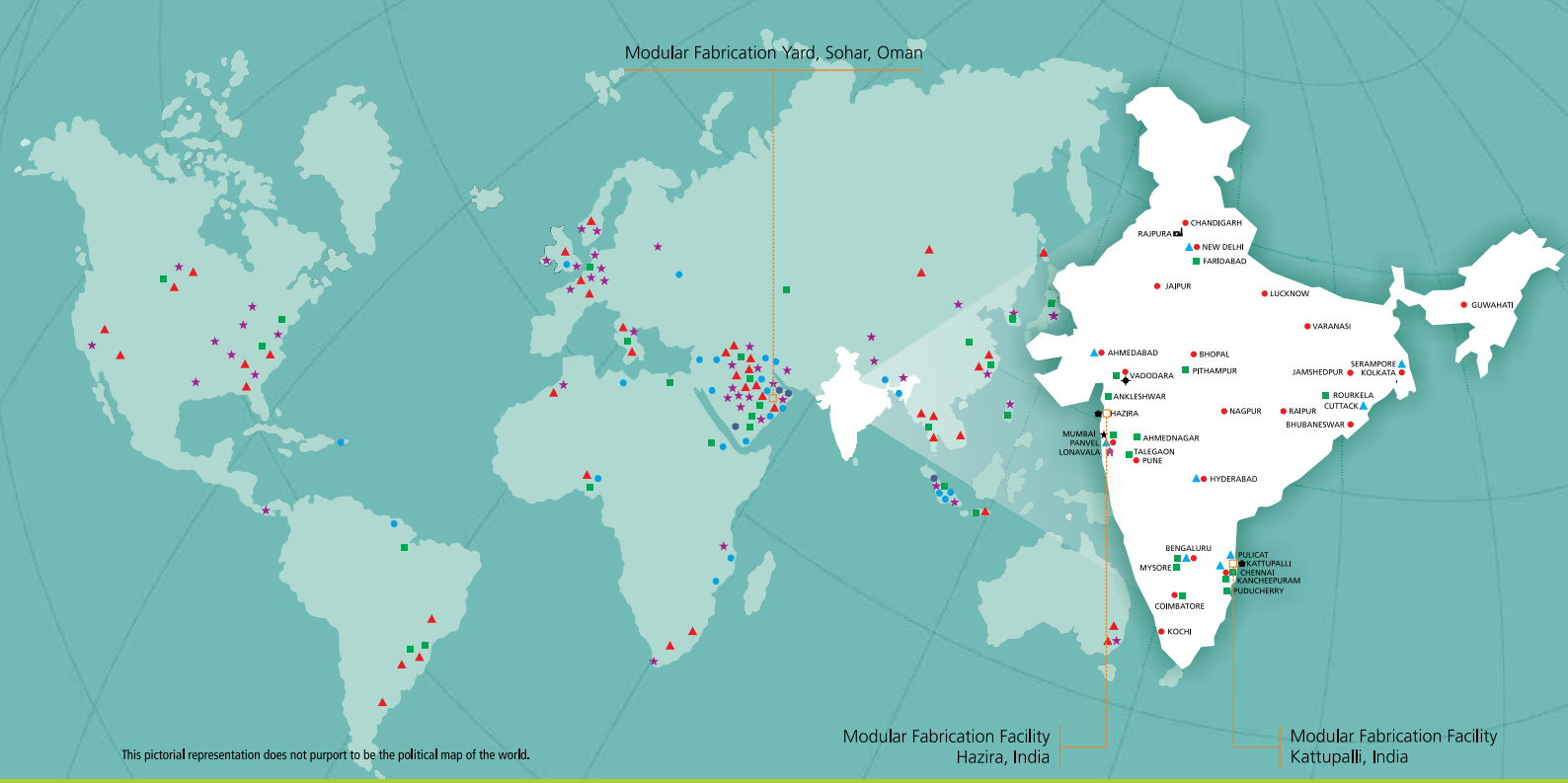
L&T Institute of Project Management (IPM) at Vadodara – a registered educational provider of PMI, USA – develops project managers across EPC domains



L&T's Leadership Development Academy has world-class facilities to deliver learning and development programmes.



Safety Innovation School at Hazira, Gujarat – part of multiple initiatives for the propagation of a safety culture company-wide



This pictorial representation does not purport to be the political map of the world.

Global Presence

- ★ Offices
- Engineering & Construction Projects
- ▲ Product & Equipment Supply
- Manufacturing / Fabrication Facilities
- Agents
- Modular Fabrication Facilities

Note: Map is broadly representative of L&T's presence in markets worldwide. For details of establishments within India, please refer to 'National Network'.

National Network

- ★ Registered Office
- Campus*
- Power Plant
- Shipyards
- Offices
- ◆ Knowledge City
- ★ Leadership Development Academy
- ▲ Construction Skills Training Institutes*

* 'Campus' denotes facilities for design and manufacture
 * Part of L&T's Corporate Social Initiatives

OFFSHORE

Quadrant 4, 10th Floor
 A.M. Naik Tower, L&T Campus, Gate No. 3
 Jogeshwari-Vikhroli Link Road (JVLR)
 Powai, Mumbai – 400 072, India
 Email: LTEH.Offshore@Larsentoubro.com

ONSHORE

L&T Knowledge City
 Ground Floor, West Block-I, N.H.8, Vadodara 390 019, India
 Tel: +91-265-245 1501 / 1143
 Email: LTEH.Onshore@Larsentoubro.com

CONSTRUCTION SERVICES

TC-III, Tower-A; 3rd Floor, 'C' Wing, Mount-Poonamallee Road
 Manapakkam, P. B. No. 979, Chennai 600 089, India
 Tel: +91-44-3319 2610 / 2745
 Email: LTEH.CS@Larsentoubro.com

MODULAR FABRICATION

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 E-mail : LTEH.Modular@Larsentoubro.com

AdVENT (Advanced Value Engineering & Technology)

Quadrant 2, 14th Floor
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Asset Management

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Offshore Wind Farm

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