

HYDROCARBON BUSINESS

Overview:

L&T Hydrocarbon Engineering Limited (LTHE), a wholly-owned subsidiary of L&T, provides integrated 'design-to-build' turnkey solutions for the hydrocarbon industry globally. The business executes projects for oil and gas extraction and processing, petroleum refining, chemicals and petrochemicals, fertilizers, cross-country pipelines and terminals. In-house capabilities range from front-end design through detailed engineering, procurement, fabrication, project management, construction and installation up to commissioning services.

LTHE has a fully integrated capability chain, including in-house engineering and R&D centres, world-class modular fabrication facilities, as well as onshore construction and offshore installation capabilities. Major facilities in India include Engineering & Project Management Centres at Mumbai, Vadodara, and Chennai, as well as Fabrication Yards at Hazira (near Surat) and Kattupalli (near Chennai). The business has an overseas presence in the Middle East, i.e. in the UAE (Sharjah), Saudi Arabia (Al-Khobar), Kuwait and Oman (Muscat), as well as in Algeria. The business also has a major Modular Fabrication and Heavy Engineering Facility at Sohar in Oman.



Bassein Development 3 Well Platform & Pipeline Project for ONGC

LTHE caters to clients across the hydrocarbon value-chain through five key business verticals:

Offshore

Lumpsum turnkey EPCIC solutions are offered to the global offshore oil & gas industry encompassing wellhead platforms, process platforms and modules, subsea pipelines, brownfield developments, offshore drilling rigs (upgrade and new-builds), FPSO modules, deep-water subsea manifold & structures, living quarters, transportation & installation services, offshore wind-farm projects and decommissioning projects.

As a full-fledged EPCI player, it also has in-house offshore installation capability comprising a self-propelled heavy-lift-cum-pipe-lay vessel – LTS 3000 – held in a joint venture, and a wholly-owned pipe-lay barge – LTB 300.

Onshore

The business vertical provides EPCC solutions for a wide range of onshore hydrocarbon projects covering upstream oil & gas processing, refining, petrochemicals, fertilizers (ammonia & urea complexes), cryogenic storage tanks and LNG regasification terminals and cross-country pipelines. The business has a track record of concurrent execution of multiple mega projects successfully, with diverse technology process licensors. The vertical is



The heaviest fully integrated gas platform in Saudi Aramco's history installed by float-over method at the Hasbah field in Saudi Arabia

complemented by the Design Engineering capabilities of L&T-Chiyoda for onshore engineering and L&T Gulf for pipeline engineering.

Construction Services

This business vertical renders turnkey construction services for refineries, petrochemicals, chemical plants, fertilizers, gas-gathering stations, crude oil & gas terminals and underground cavern storage systems for LPG and cross-country oil & gas pipelines.

Its major capabilities include heavy-lift competency, application of advanced welding technologies, high levels of automation, management of manpower and material in large volumes at construction sites and Quality / HSE systems conforming to international practices. The business has also invested in strategic construction equipment, a range of pipeline-spread equipment, automatic welding machines and other plant and machinery for electro-mechanical construction works.

Modular Fabrication Services

The vertical specialises in fabrication and supply of modules and static equipment for offshore oil & gas fields, refineries, petrochemical plants and fertilizer complexes. It has world-class modular fabrication facilities strategically located at Hazira (India's west coast), Kattupalli (India's east coast) and Sohar (Oman), with a combined annual capacity

in excess of 200,000 MT (depending on the product mix). The business is also equipped to supply foundations and other modules for offshore wind-farm projects and modular e-houses. The all-weather waterfront facilities provide easy access to clients across the globe and have load-out jetties suitable for the dispatch of large and heavy modules via ocean-going vessels and barges.

A new Integrated Manufacturing Facility has been recently opened at Jubail in Saudi Arabia to cater to the local market.

Advanced Value Engineering & Technology Services (AdVENT)

AdVENT (the erstwhile 'Engineering Services' vertical) offers customer-centric solutions for the Hydrocarbon sector and emerging industries, while addressing the specific needs of the changing energy sector. Leveraging its domain expertise in high-end engineering and the experience gained from the execution of large-scale, technologically complex EPC projects, AdVENT delivers comprehensive solutions encompassing Design & Engineering, Project Management, Strategic Project Delivery, Modularization, Smart Asset Management and Green Energy to global clients.

Business Environment

During FY 2019-20, two key drivers impacting a structural shift were the increase in oil supply by OPEC and the



Three Gas Production Deck Modules (PDMs) for Saudi Aramco, ready for dispatch from LTHE's Modular Fabrication Facility at Hazira, India

collapse in oil demand by the shuttering of the global economy due to the coronavirus pandemic. The price of oil fell 30% due to oversupply in the first week in March, even before the impact of COVID-19 was factored in.

The domestic market also witnessed deferment of projects by a few quarters due to overcapacity in the domestic refining sector. The domestic segment also witnessed stiff competition from new entrants.

In the Middle East, the other major focus region for LTHE - the business was impacted by the oil prices coming under pressure due to over-supply and the price war between Saudi Arabia and Russia. Saudi Arabia - where LTHE has a decent market share of the Offshore business, given its position of being the select contractor under the Long Term Agreement (LTA) - saw new contractors being pre-qualified. This impacted LTHE's share in the contracts being awarded under LTA. Concerted localization efforts in the Kingdom of Saudi Arabia are in progress to position LTHE as a compliant contractor to achieve IKTVA (In-Kingdom Total Value Add). In other geographies, such as the UAE and Qatar, the business is addressing the increasing ICV (In-country Value) requirements.

With a focus on 'Execution Par Excellence', LTHE achieved robust financial performance, as compared to its global peers.

Major Achievements

Major orders won during the year:

- EPCIC contract for the development of the Heera Panna Block of the Western Offshore basin involving wellhead platforms, subsea rigid pipelines, riser installation and modification work at existing platforms
- EPCIC contract for the development of the Mumbai High South field of the Western Offshore basin involving a Water Injection Platform Bridge connected to the existing WIS platform, Living Quarters, modification and interconnection of all the utilities with the existing platforms
- Marjan Incremental Development Project by Saudi Aramco, a mega project in consortium with EMAS AMC PTE Ltd. (a Subsea 7 Company) involving tie-in platforms, tie platform module, production deck modules, 217 km of subsea pipelines and 145 km of subsea cables
- EPCI contract from Saudi Aramco, involving 28 offshore jackets in Saudi Arabia's Zuluf, Marjan, Safaniya and Ribyan offshore fields in consortium with EMAS AMC PTE Ltd.
- EPC contract for setting up a 3.55 MMTPA Residue Upgradation Facility (RUF) for Visakh Refinery Modernisation Project (VRMP) at HPCL's Vizag Refinery to convert the heaviest oils into high-quality Euro 6 diesel



Cracker Furnace Package under execution for HMEL, Bathinda, India



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

- EPC contract for setting up a new 9 MMTPA Atmospheric & Vacuum Distillation Unit (AVU) and allied facilities for Barauni Refinery Capacity Expansion Project of Indian Oil Corporation
- Process and Piperack Modules (28,000 MT) for a Refinery Project in South East Asia from EPC Contractors Consortium, as a repeat order
- Supply of critical modules for Air Separation Process Modules for a leading International Technology Company for their projects in USA and Algeria, as a repeat order
- Three Instrumentation Houses for an international client for a project in Algeria

Projects Completed

- During the year, the Offshore vertical achieved partial mechanical completion for Hasbah II project of Saudi Aramco and completed ONGC's Bassein Development 3 Well Platform & Pipeline Project and Neelam Re-development & B173AC Project
- The Onshore vertical achieved mechanical completion of the IndMax FCC Unit for IOCL Bongaigaon and completed the major milestone of Ready for Commissioning – Multiphase Pump for Haliba Field Development project of Al Dhafra Petroleum Operations Company Ltd., UAE.

- The Construction business achieved the Commissioning of Phase-2 of the Coal Bed Methane Development Project at Shahdol in Madhya Pradesh for Reliance Industries, Commissioning of Syngas Phase 2 Project at Kochi for Air Products involving expansion of gas separation facility based on cold-box technology and laying & commissioning of pipeline for Barmer–Pali and Palanpur–Pali projects

Significant Initiatives

The mission of 'Execution Par Excellence' is reflected in LTHE's continued emphasis on sharper bidding to enhance its market share and execute projects within time and cost to protect bid margins. The business continued its journey with its Operational Excellence initiative, which has yielded results by way of enhanced cost-competitiveness in its bids and further improvement in its bottom-line for projects under execution.

The business is resorting to newer manufacturing techniques such as the Assembly Line Concept and Serial Production technique for fabricating multiple jackets concurrently. Additionally, cutting-edge technologies in the pipe-welding process through automation and process upgradation are implemented at its fabrication facilities and construction sites for increased productivity and better quality. Additionally, Construction Competency Centres and Skill Development Centres have been augmented.



Normal Paraffin & Derivative Complex for Farabi Petrochemical Company, Yanbu, KSA

LTHE has proactively embarked on an organisation-wide Digital Transformation Programme for integrating Business Processes, Enterprise Software and robust In-house IT applications to enhance execution efficiency. This will result in shorter project cycles, project progress visualisation through Digital Walls, assured delivery schedules, cost-competitiveness and enhanced risk mitigation; thereby providing business differentiators for delivering projects. Additionally, connected-construction machinery and connected-workmen are being tracked through IoT to improve productivity.

To create a strong foundation for business intelligence, analytics and knowledge management, LTHE has implemented an Enterprise-wide Project Lifecycle Management programme (EPSILON). This provides a collaborative space for all project stakeholders to interact around a 3D-model-based integrated workspace wherein project teams can plan together, conduct what-if analysis, share and view project updates and manage changes.

In order to create new opportunities with a sustained revenue stream, the AdVENT vertical is pursuing several initiatives such as Smart Asset Management, Operation & Maintenance (O&M) services and development of Green Energy projects. The AdVENT business is actively engaged with various R&D Centres and startups to harness emerging technologies and create differentiated solutions for its customers.

Environment, Health and Safety

The business remains committed to achieving HSE excellence at the workplace and beyond by continuously striving to improve, protect and develop the health, safety, and environmental assets of its employees and stakeholders. LTHE strongly believes that every incident is preventable, and is committed, through its 'Zero Incident Credo', to providing a safe and healthy workplace. During the year, the business clocked over 102 million safe man hours at a stretch across a dozen successful projects in both the domestic as well as international markets, including the three modular fabrication yards.

The business drives HSE excellence across the EPC value chain, from engineering to commissioning of projects, applied to all stakeholders by reinforcing a safe working culture through various initiatives. HSE Assurance Audits were initiated and carried out for all the verticals to ensure the effective implementation of the HSE management system across the business. Besides introducing new HSE Training and HSE Design Policies, it redefined a set of 'Golden Safety Rules' to strengthen and transform the safety culture.

Considering HSE performance an important factor for business, many new HSE leading and lagging parameters were added in the monthly online reporting system. Further, various HSE Digitalisation Initiatives were undertaken, such as VR (Virtual Reality) based HSE Training,



Coal Bed Methane Project (Phase II) for Reliance Industries at Shahdol, India

Electronic Permit to Work (e-PTW), Online Incident Reporting & Investigation, Behaviour-based Safety and Digital Health Monitoring.

During the year, the business bagged 22 national and 10 international level awards for best HSE performance. These include:

- The British Safety Council's International Safety Award for demonstrating a strong commitment to good Health & Safety Management
- Middle East Energy Award 2019 under the category of 'HSE Innovation of the Year' for Workmen Safety Observation Programme
- Indian Chamber of Commerce's National Occupational Safety & Health Award 2019
- Confederation of Indian Industry's Safety Best Practices Award in recognition of the various HSE initiatives
- The Royal Society for the Prevention of Accident Gold Award for Health & Safety performance during the year 2019

The business also received HSE recognition from several clients, a few of which are listed below:

- Certificate of appreciation for achieving 32 million safe man-hours from Saudi Aramco for HASBAH Offshore Gas Facilities Increment II

- EHSS excellence award for achieving 25 million safe man-hours from Farabi Petrochemical for N-Paraffin and Derivative complex
- Certificate of appreciation for achieving 8 million safe man-hours and for Best HSE performance from IOCL for the Indmax FCC project
- Certificate of appreciation for achieving 5 million safe man-hours from EIL for the HPCL CDU VDU project

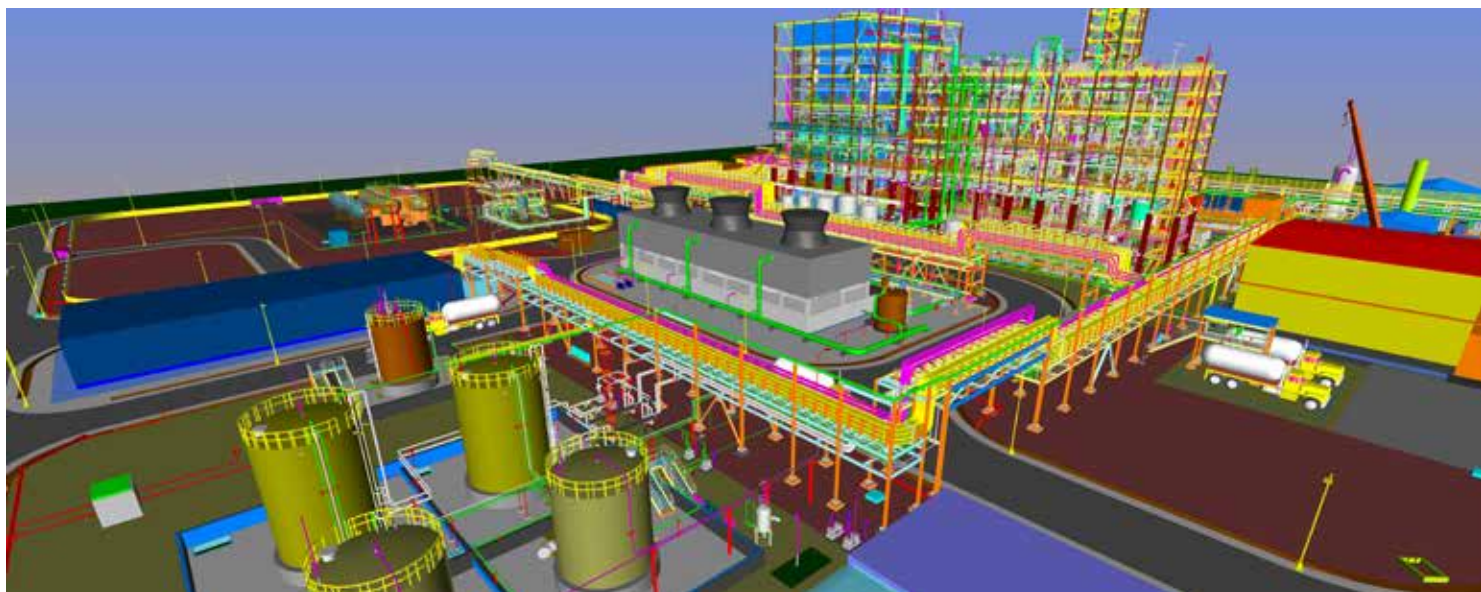
As a responsible corporate citizen, LTHE is determined to continue operating in an environmentally sustainable manner by fostering the HSE culture in all its activities.

Human Resources

The business focuses on recruiting and retaining a unique and diverse set of talented and passionate individuals.

The organization utilizes various state-of-the-art training infrastructure and resources like the L&T Leadership Development Academy (LDA), the Institute of Project Management (IPM) and technical training centres to develop the employees' Project Management skills, Functional and Leadership competencies, as well as nurture and groom talent.

In order to inculcate a culture of driving continuous career advancement of internal talent, the business has initiated a 'DREAM' Career Planning architecture for sustainable growth of employees, and is strengthening its position in



A 3D model of 10,000 TPA Hydrazine Hydrate Plant for Gujarat Alkalies and Chemicals Limited (GACL)

Social Media through professional networking sites. The design and deployment of the GENIE: Engagement survey with the subsequent business-specific and managerial-level interventions undertaken and communicated through the multiple forums of 'IGNITE', such as 'town halls', webcasts and video conferencing, bears testimony to LTHE's commitment in creating a highly engaged workforce. A culture of appreciation is inculcated by various reward and recognition interventions. The 'I-TOO' recognition framework, initiatives like ICONS, Long Service Awards, Talent Champions, Team Building Workshops, non-monetary recognition events, etc. are periodically undertaken to enhance employee motivation.

Innovation is recognized based on merit. LTHE appreciates the convergence of divergent thought processes and ideas. The business stands united in its mantra of 'Together We Succeed' by practising 'Execution Par Excellence'.

Risks and Concerns

The fortunes of the business are heavily linked to the global oil prices and green environment pressures. Further, with nearly 50% of the business originating from international markets, geo-political situations have a major impact on new orders and the execution momentum. With some key competitors rendered with surplus capacity, cost competition is becoming challenging, and is further accentuated by the increasing requirement for localisation in some of the regions where the business has a presence.

The business addresses the risks by continuous evaluation of its portfolio, examining the emerging scenario, exploring newer regions and addressing cost-competitiveness on an on-going basis, while undertaking operational excellence.

Besides, the business may also face risks such as difficult contract terms set by clients, tight schedules, counterparty risks, currency and commodity exposures, vendor defaults, delay in material delivery, QHSE, productivity, etc. These risks are mitigated through specific actions, such as operational excellence initiatives, alliances, compliance with stringent QHSE standards, timely forex and commodity price hedging, strong contract and claims management and identification of key personnel and talent at the pre-bid stage.

The risk management policy and guidelines have facilitated the creation of a consistent set of standard tools and templates incorporating global best practices and procedures. Proactive risk management enables building the ability to anticipate challenges, as well as mitigate and identify opportunities which may help achieve strategic objectives. The business promotes a culture of transparency in flagging problems as early warning signals for the Management's timely attention.

Outlook

The downward oil price spiral started with the warring between OPEC and Russia and was further fuelled by the onset of the global pandemic, due to which the oil demand



Lowering of new strategic gas export pipeline (Size: 30" / 40" x 146 km) from North Kuwait to Mina Al-Ahmadi for Kuwait Oil Company

depleted to a record low. To stabilise the plummeting oil prices, OPEC and Russia have reached an agreement to cut oil production. Further, the U.S. also cut its 2020 oil production forecast by more than 1 million barrels a day due to the plummeting demand and collapsing crude prices. Oil prices are expected to predominantly remain under stress during 2020. Volatility and uncertainty in oil prices is expected to delay project awards in the hydrocarbon segment. Further, most of the Middle Eastern GCC economies plan to diversify into several other sectors other than hydrocarbon.

With international oil companies evincing interest in the market, investments in West and North Africa may fructify in case crude oil prices show upward movement.

On the domestic front, the Ministry of Petroleum and Natural Gas is working in collaboration with various Central Government Ministries, State Governments, and stakeholders to make efforts to achieve reduction in import dependency for oil in the long run through use of alternative fuels like ethanol and biodiesel through the Ethanol Blending in Petrol (EBP) Programme and Biodiesel blending in diesel. The Government has formulated a

National Biofuel Policy 2018 to boost the availability of biofuels in country. It has launched a Sustainable Alternative Towards Affordable Transportation (SATAT) initiative for producing Bio CNG by setting up 5000 Bio-CNG plants in next five years.

The Union Budget has proposed a capital outlay of ₹ 98,522 crore for oil and gas companies for FY 2020-21, comprising ₹ 52,019 crore for the Exploration and Production segment, ₹ 41,654 crore for the Refining & Market segment ₹ 4,754 crore for the Petrochemical sector. Major domestic pipeline projects which were deferred in FY 2019-20 are expected to pick up during FY 2020-21.

The Company will expand its bid pipeline and explore new clients and new markets in the adjacency of its existing capabilities.

With the onslaught of the pandemic, numerous challenges are also expected in project execution. The aim of the business will be to remain cash-positive and adopt the PIO approach, viz. **P**rotect the business, be **I**nnovative in approach for solving unanticipated problems and look for **O**pportunities in the marketplace that could give strategic advantages in the medium and long term.