HI-TECH MANUFACTURING SEGMENT

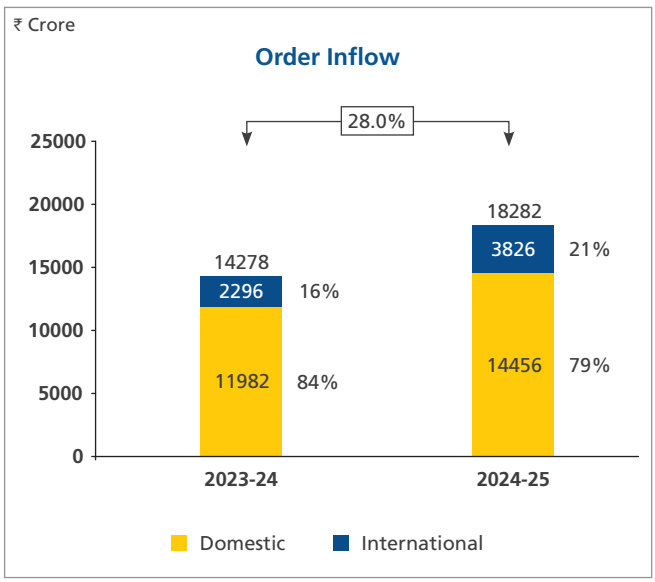
Screw plug Heat Exchanger for ICA FLUOR Daniel, Mexico

The Hi-Tech Manufacturing segment comprises of:

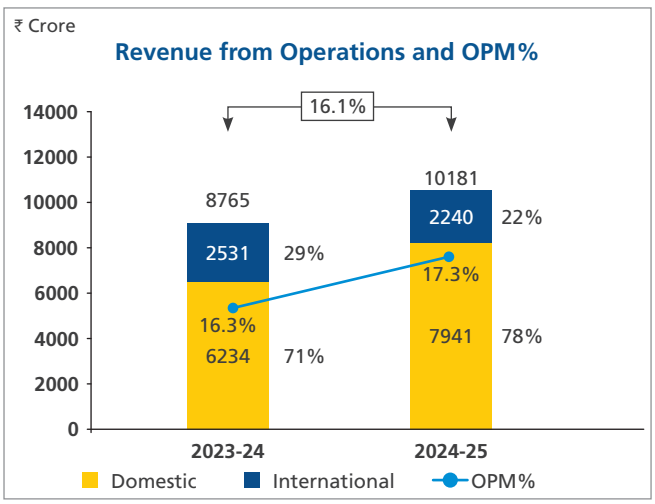
a) Heavy Engineering Business

b) Precision Engineering & Systems Business

Financial performance of the segment



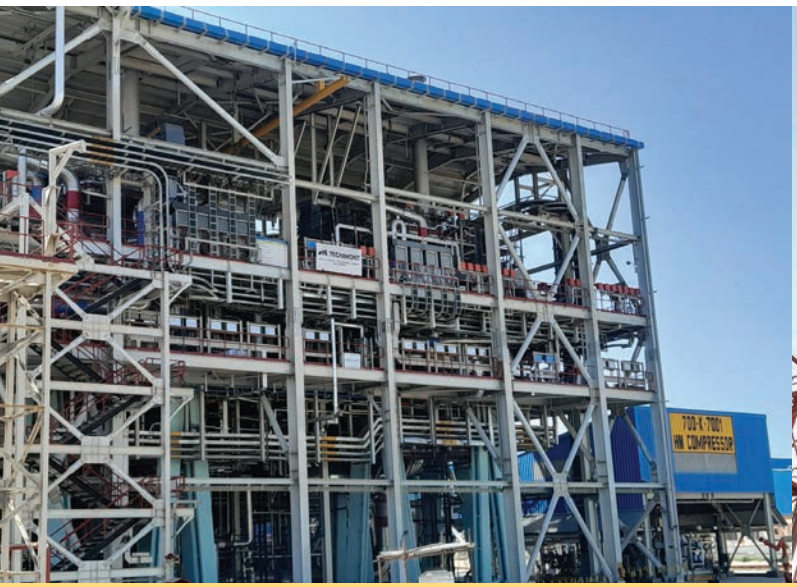
The Hi-Tech Manufacturing segment achieved order inflows of ₹ 18,282 crore during FY 2024-25, registering growth of 28.0% over the previous year, mainly on receipt of key orders in Precision Engineering & Systems and Heavy Engineering businesses. The share of international orders increased to 21% in the current year from 16% in FY 2023-24.



The Hi-Tech Manufacturing segment achieved revenue of ₹ 10,181 crore for the year, registering a growth of 16.1% y-o-y due to a pick-up in execution momentum. The share of international revenue in FY 2024-25 was at 22% of the total revenue of the segment as compared to 29% in the previous year, due to tapering of execution in key international jobs nearing completion.

The segment's operating margin improved to 17.3% from 16.3%, mainly due to execution cost savings.

Funds employed by the segment as on March 31, 2025, at ₹ 2,250 crore increased by 66.3% y-o-y, mainly due to acquisition of remaining 26% stake in L&T Special Steels and Heavy Forgings Private Limited (LTSSHF) from the Nuclear Power Corporation of India Limited (NPCIL).



Molten Salt Bath Reactor System with MCC Japan Technology, IOCL, Dumad, Gujarat

FCCU Revamp at Nayara Energy, Vadinar, Gujarat

Heavy Engineering Business

Overview

The Heavy Engineering business is a global leader in the manufacturing of engineered-to-order hi-tech reactors and high pressure (HP) and high temperature (HT) heat exchangers for refinery, petrochemicals, fertiliser, oil & gas and nuclear power plant sectors. The business has implemented extensive Industry 4.0 technologies in its manufacturing and operations.

The A. M. Naik Heavy Engineering complex at Hazira is a globally benchmarked state-of-the-art fully integrated, digitally enabled manufacturing complex. The complex consists of in-house engineering and technology centres, manned by highly skilled teams, committed to a safe and sustainable work culture.

The business is organised into the following product business units (PBUs) -

- The **Reactor & Pressure Vessels (RPV)** unit specialises in fabrication of hydro-processing reactors, tubular reactors, gasifiers, ammonia converters, urea reactors, coke drums, fluid catalytic cracking (FCC) reactor – regenerator system, oxidation reactor, titanium cladded equipment, LNG / gas processing pressure vessels and heavy columns.
- The **Heat Transfer Equipment (HTE)** unit specialises in molten salt reactor system, ammonia and urea exchangers, HP screw plug heat exchangers, methanol converters, propylene (PO) reactors, vinyl acetate monomer (VAM) reactors and fired-tube waste heat boiler packages.
- The **Process Plant Internals (PPI)** unit specialises in proprietary internals for reactors and ammonia converter baskets, chemical vapour deposition (CVD) reactors for polysilicon plants involving exotic metallurgy like stainless steel, duplex / super duplex stainless steel, inconel, monel, hastelloy, titanium, zirconium, etc.
- The **Modification, Revamp & Upgrade (MRU)** unit offers value-added end-to-end solutions for multi-disciplinary lumpsum turnkey (LSTK) brownfield revamps such as urea energy saving projects, debottlenecking / capacity enhancement of oil & gas units including multi-shutdown facility revamp, FCC revamps, crude distillation unit / vacuum distillation unit revamps, urea reactor life extension, coke drum critical repairs/replacement, heat exchanger revamp, and emergency repairs for the process plant industry.
- The **Nuclear** business unit specialises in steam generator assemblies (SGA), end shields, pressuriser, calandria, reactor roof slabs, end-fittings, control rod drive mechanisms (CRDMs), SS thermal insulation panels, heat transport systems, fuel transfer equipment, steam separators / mist eliminators, heavy water upgrading columns, exchange unit towers and internals, heat exchangers, high and low level waste storage tanks and special equipment for in-service inspection. It supplies critical components for fusion reactors (ITER), fast breeder reactors and casks / canisters for handling spent fuel and critical equipment for various programmes.

Hydrotreating Reactor for the Antonio Dovali Jaime Refinery at Salina Cruz in Mexico

- The **Special Fabrication Unit (SFU)** fabricates critical titanium piping spools, complex internals for gasification plants, loop reactors, primary quench exchangers (PQE), double pipe heat exchangers for the polysilicon industry, filter vessels and refractory lined reactor regenerator internals for the petrochemicals sector.
- **L&T Special Steels & Heavy Forgings Pvt. Ltd. (LTSSHF)**, a wholly owned subsidiary of L&T from February 2025, operates a state-of-the-art integrated manufacturing facility that provides end-to-end solutions from scrap to finished forgings, all under one roof. The plant utilises advanced technology to produce high-quality heavy forgings for various industries, thereby contributing to India's manufacturing push.

Business Environment

FY 2024-25 presented significant challenges as geopolitical uncertainties and ongoing military conflicts impacted supply chains leading to increased freight costs and longer delivery times. However, the domestic market was robust with strong demand, supportive policies and growth opportunities in select sectors.

New policy initiatives are expected to transform India's nuclear energy sector. The government aims to achieve 100 GW of nuclear power capacity by 2047, with the development of Bharat Small Reactors (BSRs) and Bharat Small Modular Reactors (BSMRs). Proposed amendments to the Atomic Energy Act and the Civil Liability for Nuclear Damage Act aim to facilitate private sector participation, enabling industries to establish BSRs as captive power plants. This policy shift is expected to stimulate demand for reactor components, specialised materials and skilled labour, thereby bolstering the entire supply chain.

Major Achievements

During the year, the business delivered multiple critical equipment on time, including the world's heaviest ethylene oxide (EO), hydrotreating and high pressure heat exchangers (HP HX) reactors.

Major international orders won:

- 68 equipment for Woodside Louisiana LNG Project, USA
- DHT reactors for Marathon Galveston Bay Refinery, USA
- Imperial Oil Refinery, Canada – first FCC from Canada
- Ceyhan, Turkey – first international loop reactor order

SFU successfully executed filter vessels in KSA and achieved a milestone by securing a record-breaking order to manufacture more than 100 numbers filter vessels within a year. Additionally, SFU has developed expertise in titanium spool fabrication and completed its first bio-refinery site project.

On the domestic business front:

- Secured 17th consecutive urea reactor, reinforcing its position as the industry leader
- Received an order for a urea revamp project, which includes India's longest urea reactor

Steam Generator (SG) for Indigenously developed 10 X 700 MWe Pressurised Heavy Water Reactor, NPCIL

- Made inroads into the specialty chemical market with first ever order from a domestic paints major
- Nuclear business unit has successfully delivered four steam generators for NPCIl's Kaiga 5 & 6 units

Significant Initiatives

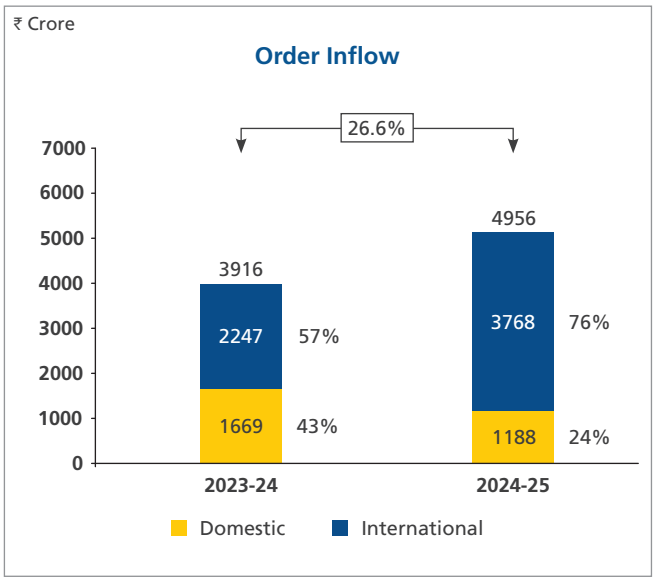
Implemented an end-to-end digital transformation programme - iRUDRA. The programme requires the deployment of five platform solutions namely CRM, IEMQS, Brah-m, IIoT and WFM. These platforms are currently in the adoption and value realisation phase and, when implemented, are expected to improve operational excellence and product quality.

Outlook

The business remains positive in its outlook for order prospects. The growth in demand for renewable diesel, biodiesel and sustainable aviation fuel is expected to throw up project related opportunities in the near to medium-term. Oil to chemicals projects in Asia and LNG sector projects in the USA and the Middle East could provide future avenues for growth.

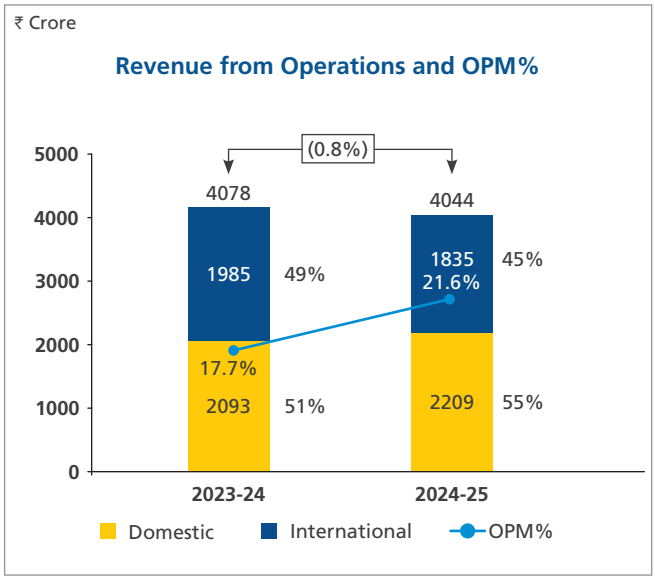
The MRU business has established itself as a reliable brownfield contractor in India and the GCC region. Opex spending, oil-to-chemicals, gas-to-chemicals, coal gasification, revamp of ageing fertiliser plants and energy efficiency projects would continue to drive growth for the business.

Financial performance of the business



The Heavy Engineering business recorded an order inflow of ₹ 4,956 crore for the year ended March 31, 2025, higher by 26.6% as compared to the previous year, mainly due to the receipt of a high-value international order in the nuclear equipment business. The share of international orders increased to 76% in the current year from 57% in the previous year.

Modular Bridging System



The Heavy Engineering business's revenue of ₹ 4,044 crore has remained steady on a y-o-y basis, given the stage of execution of orders in its order book. The MRU business, however, reported improved execution of orders. The share of revenue from international operations has decreased to 45% compared to 49% in FY 2023-24.

The operating margin of the business improved from 17.7% to 21.6% due to execution cost savings.

Precision Engineering and Systems Business

Overview

L&T made its foray into various strategic sectors, namely nuclear power, aerospace and defence in the sixties, early seventies and mid-eighties, respectively, as part of the Company's focus on building a strong and self-reliant India by leveraging its precision and systems engineering capabilities. This was well ahead of the opening up of these sectors for private industry participation, beginning with defence in 2001 and aerospace in 2020.

During the one and a half decades preceding the opening up of the defence sector for private sector participation, L&T was associated with the Defence Research & Development Organisation (DRDO), while concurrently contributing towards the Indian Navy's - 'A Builders Navy' aspiration, by development of platform-specific equipment and systems across classes of naval platforms with in-country value addition. Today, L&T has a state-of-the-art shipyard capable of building large warships, conventional submarines and critical equipment and systems for these platforms.

In the land systems domain, the business is engaged in design-to-delivery solutions across a host of artillery programmes, air defence programmes, armoured platforms, weapon delivery platforms and combat engineering systems. L&T is a strategic industry partner to the Indian Ministry of Defence. In the space sector, the business continues to

India's indigenous Light Tank 'Zorawar' prototype

be a trusted partner to ISRO across technology streams, i.e. in manufacturing of boosters; manufacturing of a range of metallic and composite hardware for launch vehicles and satellites; establishing ground test facilities on turnkey basis; partnering in developing new manufacturing technologies with various advanced materials; and establishing complete satellite communication infrastructure and other deep space communication systems.

Having built a portfolio of products, systems, platforms and solutions, and correspondingly a basket of technologies, the business provides concept-to-design-to-delivery solutions across chosen segments with a focus on indigenous design and emphasis on creating Indian Intellectual Property (IP).

The business is structured to provide focus to various segments of operations, as under:

- Marine Platforms, Equipment & Systems
- Land Platforms, Equipment & Systems
- Aerospace Systems
- Electronics Products & Systems

Given L&T's capability in defence electronics and leveraging its foray into semiconductor design, the business is further seeking to expand its offerings to cover industrial electronic modules, products and systems in critical sectors like mobility, automation and robotics, power systems and communications.

The business is headquartered at Powai, Mumbai and its operations which extend across India, also include a Technology & Innovation Centre for development of futuristic technologies, Centre of Excellence for Artificial Intelligence, multiple segment-focused Design & Development Centres and the following dedicated Production Centres:

- A. M. Naik Heavy Engineering Complex at Hazira (near Surat) for manufacturing, integration and testing of armoured and allied land platforms, hulls as well as pressure-proof structures for underwater platforms
- Shipyard at Kattupalli (near Chennai) catering to new builds and repair of marine platforms
- Strategic Systems Complex for manufacturing, integration and testing of launch systems, radars, engineering equipment and control systems at Talegaon (near Pune)
- Precision Manufacturing and Systems Complex (PMSC) for aerospace systems and precision products manufacturing, equipped with Centres of Excellence for advanced composites and additive manufacturing at Coimbatore
- Strategic Electronics Centre at Bengaluru

Since its inception, the business has built a portfolio of wide ranging indigenously designed and developed products, systems, solutions, platforms and technologies. The business has indigenously conceptualised, engineered, built and supplied over 250 systems and products, with more than

USNS Charles Drew visit to L&T Shipbuilding's shipyard at Kattupalli, Chennai for Mid-Term Availability (MTA) repairs

50 of them having been delivered in serial production mode. The business model is uniquely differentiated through its focus on in-house technology and product development, innovation for serial production, mature and equated partnerships with domestic as well as global majors, both in the government and in private sector. Besides the supplies, the business offerings also include providing support during installation, commissioning, field evaluation trials, through-life support and obsolescence management. These capabilities enable the business to maintain its market leadership position in the private sector defence industry and be future-ready given the government's push for higher indigenisation and autonomy through the *Aatmanirbhar Bharat Abhiyan*.

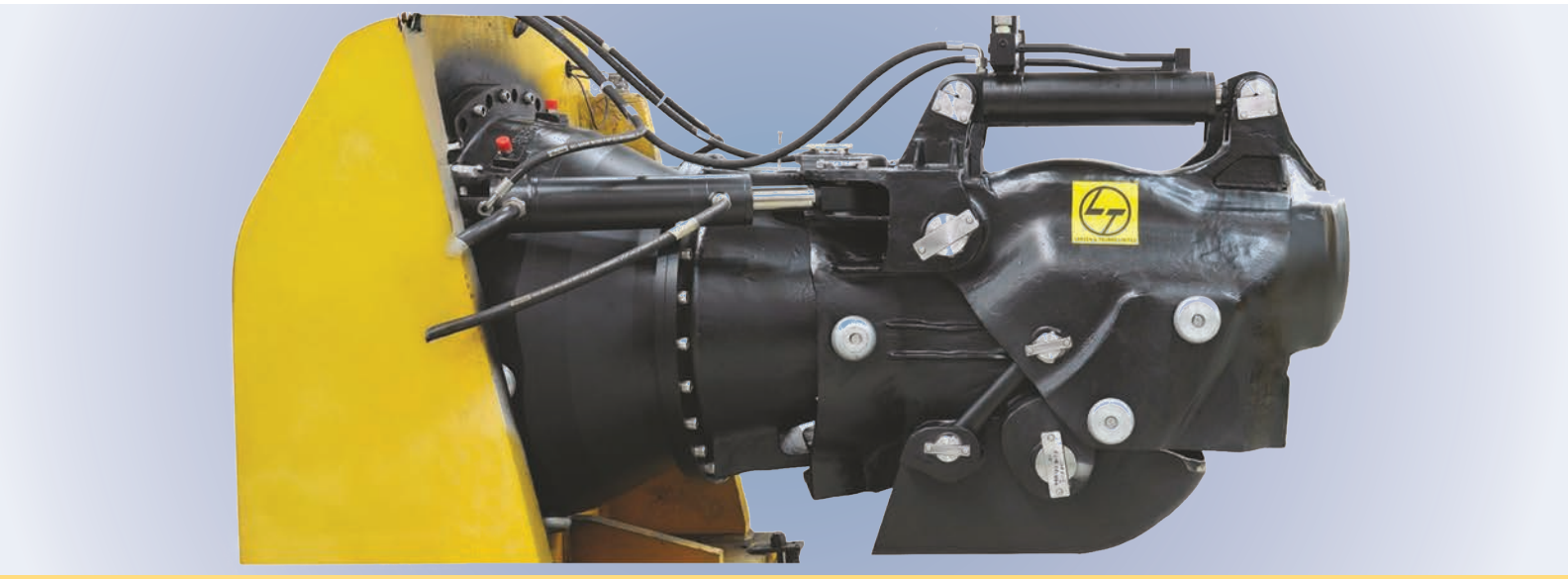
L&T's participation in the defence sector stems from its ethos of being a 'Builder to the Nation'. Various sustainability and risk assessors of defence-related businesses do recognise the right of countries to defend themselves and the need to develop and produce defence-related products to fulfil security, peacekeeping and humanitarian needs. This is well acknowledged in the current era of multiple regional conflicts where nations have increased their spending on defence to ensure national security.

It is noteworthy that the business's prime customer and regulator, i.e. the Indian Government, is committed to non-proliferation under the "Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act, 2005". India is also a signatory to the Missile Technology Control Regime (MTCR), a multilateral export control regime, and a party to the Wassenaar Arrangement – a voluntary export control regime that limits the destabilising proliferation of sensitive technologies. Further, India has voluntarily adopted a 'No First Use' (NFU) Policy (PIB notification dated January 4, 2003) that is enshrined in the commitments of the Cabinet Committee on Security (CCS). Further, India's application to join the Nuclear Suppliers Group (NSG) in 2016 is also under discussion. The Company recognises the need to act responsibly in carrying out its business related to the defence sector, implement internal controls and stay committed to respecting human rights.

While maintaining its position as a leading player in the Indian defence sector, **the business does not manufacture any explosives or ammunition of any kind, including cluster munitions or antipersonnel landmines or nuclear weapons or components for such munitions. The business also does not customise any delivery systems for such munitions.**

Business Environment

Traditionally defence production has been dominated by defence public sector undertakings (DPSUs). The sector is now slowly witnessing a gradual shift with increased participation and indigenous capability development by private players, public-private partnerships, start-ups and academia.



Indigenous Water Jet Propulsion (WJP)

Ministry of Defence has declared 2025 as the 'Year of Reforms'. The focus is to lay the foundation for unprecedented advancements in defence preparedness and transforming the Armed Forces into a technologically advanced combat-ready force capable of multi-domain integrated operations. There shall also be a focused intervention in simplifying and fast-tracking acquisition procedures. Towards this, the Defence Acquisition Council (DAC) has also approved guidelines for reducing timelines at various stages of the capital acquisition process to make it faster, more effective and efficient.

From the beginning of 2024 till date, the DAC has accorded approvals for capital acquisition proposals for more than 50 programmes worth close to ₹ 5 trillion, of which more than 90% of the acquisition would be from domestic sources. Few of the key programmes include Future Ready Combat Vehicles (FRCV), Next Gen Fast Patrol Vessels, Offshore Patrol Vessels and Interceptor Boats.

Focusing on new domains, simplification of acquisition procedures, promoting PPP model, a focus on collaboration and fostering of R&D partnerships between Indian industry and foreign OEMs are some of the key steps taken by government to enhance the capabilities of the domestic defence industry. The Government of India has set an ambitious target for defence exports at ₹ 30,000 crore for FY 2025-26 and ₹ 50,000 crore by 2029. The Government has also set a target for domestic defence production at ₹ 1,60,000 crore for FY 2025-26 and ₹ 3,00,000 crore by FY 2028-29.

Global defence supply chains are under significant strain due to ongoing geopolitical conflicts. The Russia-Ukraine conflict has disrupted critical supply routes, particularly in Eastern Europe, affecting the availability of essential materials and components. Additionally, the US's planned tariff imposition is expected to further strain the supply chain. These actions have increased costs for defence contractors and caused delays in production and maintenance.

L&T has focussed on developing a robust and resilient supply chain over the years with self-reliance and in-house design capabilities as the primary focus areas. The business is also in the process of developing and diversifying its supply chain with an emphasis on indigenisation.

On the space front, the opening of the sector in 2020 and the Indian Space Policy 2023 provide opportunities to the private sector for participation in end-to-end space activities from building launch vehicles and satellites to downstream programmes such as space data collection and dissemination. The business is today involved in manufacturing, assembly and integration of launch vehicles for Indian Space Research Organisation (ISRO) and NewSpace India Limited (NSIL).

Major Achievements

During the year, the business has achieved multiple successes, uniquely reaffirming L&T's positioning as a 'Nation-Builder' through a series of Make-in-India programmes. These include:

- Award of repeat order for K9 Vajra – T for 100 numbers of guns

K9 Vajra-T, 155 mm, 52-calibre tracked self-propelled artillery platform, codeveloped by L&T and Hanwha Aerospace

- Award of contract for fleet support ships from Hindustan Shipyard Limited
- Award of first supply contract for indigenous designed and developed Next Generation Helo Harnessing & Traversing System (NGHHTS) for 11 numbers of Next Generation Offshore Patrol Vessels (NGOPVs)
- Realisation of first Light Tank prototype at L&T Hazira's Armoured Systems Complex. Having carried out the design and development of this advanced platform jointly with DRDO, the Light Tank has been realised in 18 months despite global supply chain challenges
- Successful realisation of 2 sets of indigenous Water Jet Propulsion System (WJPS) under Technology Development Fund (TDF) Scheme and delivery to Mormugao Port Trust (MPT), Goa for user trials
- Breakthrough entry into the traditionally nomination-based Combat Management System (CMS) market and successful realisation of CMS for the Multi-Purpose Vessels in record time
- ISRO's 100th mission (GSLV F15) successfully launched from Sriharikota, Andhra Pradesh on January 29, 2025, with major contributions from L&T in S139 boosters, solar array deployment mechanism (SADM), honey comb deck, umbilical systems and system integration of launch vehicle and satellite
- Empanelment of L&T shipyard as supplier for Royal Australian Navy (RAN) under Defence Maritime Assurance Programme (DMAP) which allows L&T to participate in RAN vessel requirements (except frontline vessels) till August 2029
- New benchmarks established by all work centres in terms of accelerated realisation of systems and equipment (serial production category) by deploying Industry 4.0 techniques

Significant Initiatives

R&D and innovation have been the backbone of the PES business since its inception. Various R&D initiatives in the development of armoured systems, air defence guns, combat vehicles, unmanned medium calibre turrets, high precision radars, underwater and aerial targets, adaptive optics, unmanned and autonomous system technologies and deployment of AI-based solutions have been undertaken during the year.

The business has established its proficiency by leveraging Industry 4.0 practices across its operations. Focussed digital initiatives have accelerated productivity and business excellence.

Outlook

The capital acquisition budget for Defence witnessed an increase of ~4.5% y-o-y (~12.5% increase on revised estimates) for FY 2025-26, resulting in an overall budget of ₹ 1,80,000 crore. Of this, ₹ 1,49,000 crore is planned to be spent on capital acquisition, termed as the armed forces modernisation budget. The remaining ₹ 31,000 crore is for capital expenditure on R&D and creation of military infrastructure.

L&T has provided critical subsystems for most of India's space missions

A sum of ₹ 1,12,000 crore is earmarked for domestic industry, with about 25% of the domestic share provisioned for domestic private industry. About ₹ 15,000 crore (~13% increase y-o-y) from capital procurement budget has been earmarked for R&D projects to strengthen DRDO in developing new technologies and hand holding of private industry through the development-cum-production partner (DcPP) route. This allocation will further facilitate Ministry of Defence's plan to venture into new domains such as cyber and space and emerging technologies such as AI, Machine Learning, Robotics, etc.

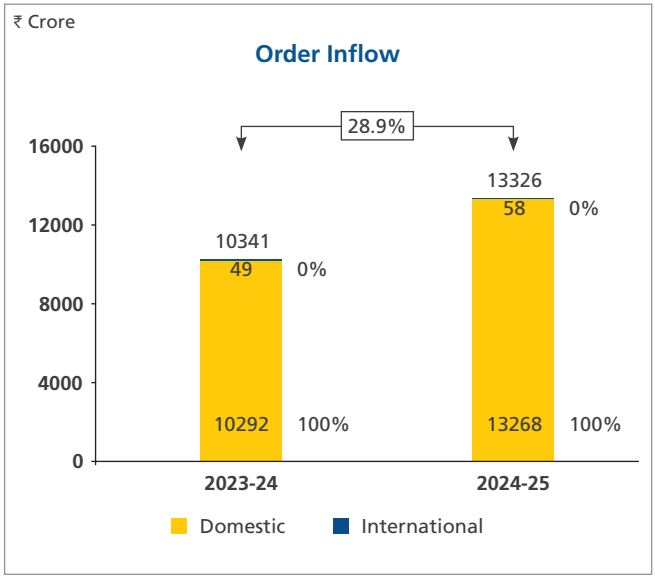
The government has budgeted a corpus of ₹ 18,000 crore for the revamped Shipbuilding Financial Assistance Policy (SBFAP 2.0) to optimise cost disadvantages, boost capacity of Indian shipyards and spur domestic shipbuilding production. The intent of SBFAP 2.0 is to provide direct financial subsidies to Indian shipyards.

In a pioneering move poised to reshape India's innovation landscape, the government in the Union Budget 2025-26 has allocated ₹ 20,000 crore to the Department of Science and Technology (DST) to initiate a private sector-driven R&D fund.

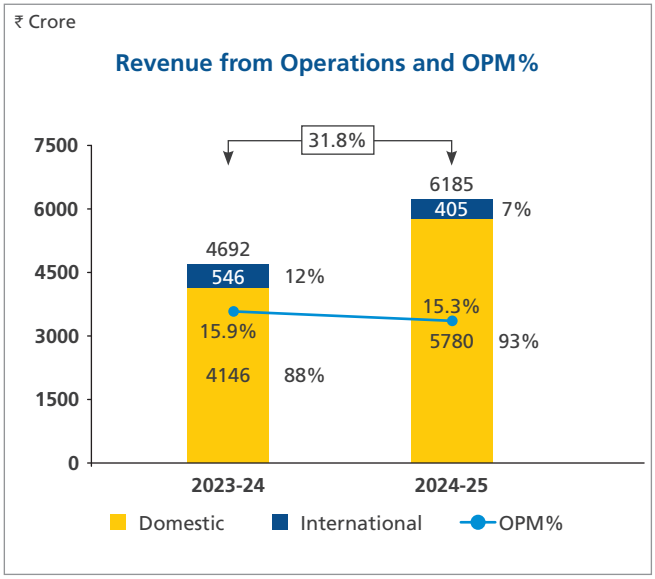
The business is well poised to leverage the government's thrust on *Aatmanirbharta* and capitalise on opportunities in shipbuilding, artillery equipment, combat engineering equipment, electronic and communication equipment and space technologies in India as well as in the select regional markets.

Manoeuvrable Recoverable Aerial Target (MRAT)

Financial performance of the business



The Precision Engineering & Systems business recorded an order inflow of ₹ 13,326 crore, registering a growth of 28.9% y-o-y, mainly due to receipt of K9 Vajra Tank repeat order. No major international orders were received during the year.



Benefitting from a higher opening order book, the Precision Engineering & Systems business earned revenue of ₹ 6,185 crore during FY 2024-25, higher by 31.8% compared to the previous year. The share of international revenues reduced to 7% from 12% in the previous year due to tapering of execution of export orders.

The operating margin is stable at 15.3%.