Role of Defence Public Sector Undertakings in Atmanirbharta

Rajiv Nayan*

In India, Defence Public Sector Undertakings (DPSUs) have been pivotal to the nation's journey towards self-reliance since independence. According to the Ministry of Defence, its Department of Defence oversees 16 Central Public Sector Enterprises (CPSEs), collectively known as DPSUs. Seven of these, referred to as the New DPSUs, were created in 2021 following the corporatisation of the Ordnance Factory Board (OFB). While debates persist regarding the effectiveness of DPSUs, especially amid a growing emphasis on private sector involvement in defence manufacturing, the 'Atmanirbharta' initiative offers a significant opportunity for these entities to adapt and redefine their objectives in light of shifting global and domestic dynamics. DPSUs are making substantial contributions to the 'Atmanirbhar Bharat' mission in the defence sector, though they continue to face challenges that must be addressed.

Keywords: *Defence Public Sector Undertakings; DPSUs; Self-Reliance; Atmanirbharta*

Introduction

The role of government-owned companies in defence production is emphasised even in countries that primarily rely on the private sector. Many

* Dr Rajiv Nayan is a Senior Research Associate at the Manohar Parrikar Institute for Defence Studies and Analyses (MP-IDSA), New Delhi.

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capitalist nations have strategically utilised government-owned enterprises for both strategic and non-strategic projects. For example, the US highlights the importance of government-owned companies in its Defence Industrial Base. The US Defence Production Act of 1950[1] includes provisions for government-owned defence companies. While the Act primarily aims to boost domestic production through private enterprises, it also supports the idea of procuring and installing 'additional equipment, facilities, processes, or improvements to plants, factories, and other industrial facilities owned by the Federal Government'[2] for national defence.

In both the US and Europe, government-owned companies have contributed to the manufacturing of arsenals, shipyards and critical weapons for many years, even as the private sector's role has steadily grown. In the US, this government-owned industry is often referred to as the 'organic industrial base'. In several European countries, governments still maintain significant stakes in their national defence industries, and oversee executive appointments.[3] Across Europe and the US, numerous military ship repair facilities remain under government control.[4]

Additionally, the 'government-owned, contractor-operated' model exists in many Western nations. Notably, in the United Kingdom (UK), there has been a recent shift towards reclaiming control from the private sector in certain security areas. One of the reports of the UK government notes that,

> Since 2000, the Atomic Weapons Establishment (AWE) had been operated via a management and operations contract with industry partners, using a government owned contractor operated (GoCo) construct. In 2020, the MOD [Ministry of Defence] concluded that AWE plc will become an Arms-Length Body, wholly owned by the MOD. This decision was taken in order to simplify and further strengthen the relationship between the MOD and AWE plc, enhancing the MOD's ability to invest in the development of the workforce, technology and infrastructure and therefore the future of AWE plc.[5]

In India, Defence Public Sector Undertakings (DPSUs) have played a key role in the country's pursuit of self-reliance since its independence. Although the Department of Defence Production (DDP) was established in 1962, several DPSUs existed even before its formation. Notably, some current DPSUs, such as Hindustan Aeronautics Limited (HAL), originated as private sector entities before their management was taken over by the public sector or the government. Interestingly, the term 'Public Sector Undertaking (PSU)'

is not explicitly defined in the Companies Act, 2013.[6] However, Section 2(45) of the Act refers to a 'Government Company', which is the legal entity commonly understood to represent a PSU.

This section of the Act states that,

> Government company means any company in which not less than fifty-one per cent of the paid-up share capital is held by the Central Government, or by any State Government or Governments, or partly by the Central Government and partly by one or more State Governments, and includes a company which is a subsidiary company of such a Government.[7]

The Department of Public Enterprises (DPE), under the Ministry of Finance, serves as the central authority for all Central Public Sector Enterprises (CPSEs). CPSEs include government companies and statutory corporations established under various Parliamentary statutes, with the Central Government holding more than 50 per cent of their equity. Notably, the Ministry of Corporate Affairs does not oversee CPSEs.[8]

However, various ministries and departments of the Indian government have their own PSUs. The Ministry of Defence reports that its Department of Defence administers 16 CPSEs, known as DPSUs.[9] Seven of these, commonly referred to as the New DPSUs, were established following the corporatisation of the Ordnance Factory Board (OFB) in 2021. There is often debate about the effectiveness of these DPSUs, especially given the global trend, including in India, of encouraging private sector participation in defence manufacturing. This article explores the continued relevance of DPSUs in achieving 'atmanirbharta' in India's defence sector.

Contribution to Atmanirbharta

The policy of strengthening DPSUs is rooted in the belief that they are indispensable and irreplaceable, particularly due to their utility in times of war. Whether newly established, reconstituted, or taken over, DPSUs have been striving to achieve self-reliance in defence. Despite their limitations, such as delays and significant reliance on foreign vendors, DPSUs possess strengths like strong revenue visibility and a substantial defence technology base. Along with the Defence Research and Development Organisation (DRDO), they have been at the forefront of advancing this mission. As an industry partner to the DRDO, which focuses primarily on research, development and technology transfer, DPSUs have successfully achieved objectives in various areas, such as producing lightweight torpedoes and

ballistic missiles. However, as a developing nation, India continues to face challenges in several sectors.

The Government of India believes that the newly created DPSUs, formed through the corporatisation of ordnance factories, will enhance self-reliance in defence preparedness by fostering a corporate culture that promotes competitiveness. While not all existing problems in these organisations can be resolved in a few years, the introduction of this new culture and continuous review of their functioning are expected to yield better results in the future.

The Standing Committee on Defence of the Indian Parliament has also expressed optimism about the potential of these new DPSUs. One of the committee's reports suggests that their creation could increase the 'overall production capacity of the domestic defence industry'.[10] As discussed, continuous improvements in work culture towards market-driven growth and innovation, alongside new government initiatives and greater professionalisation, may produce positive outcomes. In fact, this shift in work culture was evident even before the reconstitution of the OFB units. The impressive production of Dhanush artillery guns and their delivery to the Indian Army serves as a prime example.[11]

The armed forces are being encouraged to engage in long-term planning and place the necessary orders with DPSUs, which primarily rely on these orders for their operations. DPSUs are also being urged to diversify and explore foreign markets. A Parliamentary Committee report expressed hope that the modernisation needs of the armed forces would be met in a 'timely, qualitative, and cost-effective manner, and that more Indian companies would establish themselves globally as defence manufacturing giants'. The increasing indigenisation of production and market orientation of DPSUs suggest that they are moving towards these goals. Periodic reviews are further driving improvements in their functioning.

Prime Minister Narendra Modi has emphasised the need for India to become self-reliant while remaining connected to the global economy. He has introduced new pillars, goals, programmes and incentives to advance this vision. The Modi government's focus on 'Atmanirbharta' has revitalised the ongoing policy of self-reliance, particularly in defence. Various departments, branches, agencies and sectors are contributing to this effort, with DPSUs playing a key role by refocusing on their long-standing mission. The objectives of 'atmanirbharta' in defence are to achieve 'autonomy in defence production', manufacture cutting-edge equipment for the armed forces, address future security needs, and develop a production and supply chain that

positions India as an exporter. The Modi government is encouraging DPSUs to reduce the country's dependence on imports by indigenising items that are frequently sourced from abroad (Figure 1).

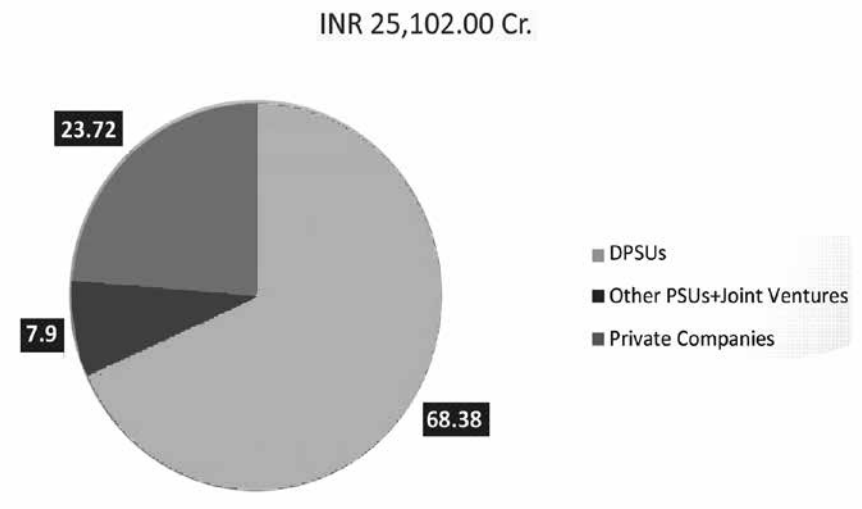

Figure 1 Segment-wise Defence Production during 2024–25
(As of 25 September 2024)
Source: 'Dashboard', Department of Defence Production, Ministry of Defence, Government of India, available at https://ddpdashboard.gov.in/DefenceProduction/Defence_Production, accessed on 25 September 2024.

The private sector, a late entrant into defence production, is also expected to contribute to the goal of self-reliance. Private companies are forming joint ventures, and aiding in the manufacture of defence items. While detailed information on the Research and Development (R&D) budgets of major defence companies is not readily available, an official from one private defence firm claimed that his company spends 8–10 per cent of its profits on R&D.[12] Other large defence firms reportedly spend between 3–7 per cent of their profits on R&D. The government budget includes provisions for R&D grants to support these companies.[13] However, government entities remain the principal drivers of self-reliance (atmanirbharta) in defence.

A Government of India press release stated that 'a record 75% (approx. ₹1 lakh crore) of the defence capital procurement budget was earmarked for the domestic industry in FY 2023–24, up from 68% in 2022–23'.[14] Another

release noted that the Defence Acquisition Council, on 'November 30, 2023, approved Acceptance of Necessity (AoNs) for various Capital Acquisition Proposals amounting to ₹2.23 lakh crore, of which ₹2.20 lakh crore (98% of the total AoN amount) will be sourced from domestic industries. This significant move is expected to boost India's defence industry and further the goal of Atmanirbharta.'[15]

Table 1 Segment-wise Defence Production
(Summation of Annual Sales Turnover as reported by the companies)

Year	Defence Public Sector Undertakings (in Rs Cr)	New Defence Public Sector Undertakings (in Rs Cr)	Other Public Sector Undertakings/ Joint Ventures (in Rs Cr)	Defence Private Companies (in Rs Cr)	Total Production (in Rs Cr)
2016–17	40,427	14,825	4,698	14,104	**74,054**
2017–18	43,464	14,829	5,180	15,347	**78,820**
2018–19	45,387	12,816	5,567	17,350	**81,120**
2019–20	47,655	9,227	6,295	15,894	**79,071**
2020–21	46,711	14,635	6,029	17,268	**84,643**
2021–22	55,790	11,913	7,222	19,920	**94,845**
2022–23	63,466	16,998	7,137	21,083	**108,684**
2023–24	73,945	19,662	6,774	26,506	**126,887**
2024–25	13,586	3,580	1,982	5,954	**25,102** (As of September 25, 2024)

Source: 'Dashboard', Department of Defence Production, Ministry of Defence, Government of India, available at https://ddpdashboard.gov.in/DefenceProduction/Defence_Production, accessed on 25 September 2024.

Eight Positive Indigenisation Lists (PILs) have been issued, including four for DPSUs, covering 4,666 items, and four for the armed services, covering 411 items, totalling 5,077 items that will be exclusively procured from domestic sources. These lists include major systems such as missiles, helicopters and corvettes. Of the 4,666 items listed for DPSUs, including those from Ordnance Factory Units, 2,849 have already been indigenised,[16] reducing the need for imports, and lowering the import dependence of DPSUs.

These lists appear to be part of a broader roadmap that is beginning to deliver results. Not only are defence components and spare parts being produced domestically, but major defence systems are also being manufactured for the armed forces. If the government and defence industry remain committed to this path, it could significantly transform India's defence production landscape.

Growth

The 'SRIJAN' portal, launched under the 'Atmanirbhar Bharat' initiative in August 2020 to provide 'Opportunities for Make in India in Defence', serves as a Common Indigenisation Platform for all DPSUs. It offers the Indian manufacturing industry access to information on items that are currently imported, were previously imported, or may potentially be imported by DPSUs. As a non-transactional platform, SRIJAN listed 36,384 items as of 17 June 2024.

Table 2 The percentage of indigenous content in major platforms/equipments/ weapons recently delivered by DPSUs

Major Platform	**% Indigenous**
Shipbuilding cases	> 70
Tank T-72	96%
Tank T-90	83%
Infantry combat vehicles (ICV) BMP-II	98%
Engine of Tank T-72	100%
Engine of Tank T-90	100%
Indigenous Rocket Launcher (IRL)	100%
Aircraft Weapon Loader (AWL)	100%
Combat Management System (CMS)	100%
Ship Data Network (SDN)	100%

Source: 'Action Taken by the Government on the Observations/Recommendations contained in the Thirty-fifth Report of Standing Committee on Defence (17th Lok Sabha) on Demands for Grants of the Ministry of Defence for the year 2023–2024 on "General Defence Budget, Border Roads Organisation, Indian Coast Guard, Defence Estates Organisation, Defence Public Sector Undertakings, Canteen Stores Department, Welfare (Demand Nos. 19 and 22)"', Standing Committee on Defence (2022–2023), Report Number 43, Lok Sabha Secretariat, December 2023, p. 37.

All DPSUs are making consistent efforts toward indigenisation. These items are slated for in-house development through Make-I, Make-II and the DRDO routes. Additionally, DPSUs have successfully indigenised several critical pieces of equipment and components required for warships and submarines. In 2023, the Ministry of Defence (MoD), in a submission to the Parliament's Standing Committee on Defence, reported that over 9,100 items had already been indigenised.[17] The government is encouraging the defence industry, including DPSUs, to indigenise the design and development of weapons systems through various methods.

Some key highlights submitted are:

- AVNL has identified 31 Line Replaceable Units (LRUs) for indigenisation, out of which 12 have been indigenised since 01/10/2021.
- BDL is designing and developing products through in-house R&D and is a co-development partner in projects/products designed by DRDO.
- To reduce import content, BEML has initiated Product Indigenisation through License Agreement, Joint Venture & Transfer of Technology with foreign OEMs [Original Equipment Manufacturers].
- HAL is aggressively and proactively participating in the Global Tenders offering HAL platforms to Friendly Foreign Countries (FFCs). The leads generated are being actively pursued.
- HSL [Hindustan Shipyard Limited] has uploaded 83 items on SRIJAN Portal and has indigenised 27 items so far. HSL has tied up with 'M/s AG Flex technologies', Mysuru, a start-up company through iDEX (Innovations for Defence Excellence) for development of 'EMI/EMC [Electromagnetic Interference/ Electromagnetic Compatibility] Shielding for Bridge windows'.
- AWEIL [*Advanced Weapons and Equipment India Limited*], IOL [India Optel Limited] and GRSE [Garden Reach Shipbuilders & Engineers] have obtained 94 per cent, 91.5 per cent and 85 per cent indigenous content respectively in their value of production.
- GIL [Gliders India Limited], TCL [*Troop Comforts Limited]* and YIL[Yantra India Limited] are a 100 per cent indigenised DPSUs exploring potential of export to foreign friendly countries.[18]

Indigenisation efforts often take decades to bear fruit. The 'Atmanirbharta' initiative builds on India's long-standing policy of achieving self-reliance in defence. However, this initiative provides DPSUs with the flexibility to procure niche technologies from abroad if such technology is unavailable domestically, or does not meet the requirements of the armed forces, which are the primary users. For instance, Bharat Dynamics Limited (BDL) is permitted to source foreign technology for specific missile categories to meet

the needs of the armed forces. This approach is intended to 'ensure faster development and production of niche technologies in the field of missiles, while contributing to the overall goal of 'atmanirbharta' or self-reliance in the defence sector'.[19]

The same situation applies to the Light Combat Aircraft (LCA), which still relies on foreign sources for its engine due to the inability of domestic R&D to produce a suitable product. A report by the Comptroller and Auditor General of India, which reviewed defence R&D expenditure, highlighted several issues that caused 'inordinate' delays in the development of an engine for the LCA.[20] While most components of the LCA have been indigenised, critical parts, like the engine, continue to be imported. Thus, the Kaveri engine project for the LCA was approved in 1989, with an initial budget of Rs 382.81 crore,[21] which escalated to Rs 2,105 crore by 2021.[22] In the same year, the government pledged an additional Rs 2,100 crore for the project.[23]

Despite these challenges, both the prototype and core engines have been developed, and thousands of hours of engine testing have been completed. As a result, the Kaveri engine became the first indigenously developed military gas turbine engine to undergo flight testing, and has achieved the Technology Readiness Level. However, due to the need for higher thrust, the LCA is currently being integrated with a foreign engine, with plans to jointly develop a more powerful engine in collaboration with an international partner. This advanced engine will also be essential for the future Advanced Medium Combat Aircraft (AMCA).[24]

Table 3 The Percentage of Indigenous Content Delivered by DPSUs

Major Platform	**% Indigenous**
ASW Corvette – P28	> 85
Landing Craft Utility (LCU)	> 90
Fast Patrol Vessel (FPV)	> 70
Water Jet Fast Attack Craft	> 70
Sighting system of BMP-II	100%
Sighting and Fire Control system of Tk T72	100%
Sighting and Fire Control system of Tk T90	68%
STP	23%
RO Plant	63%
Gear Box	85%
3HP Air compressor	98%
Capstan	100%

(Table 3 continued)

Emergency Generator	80%
HVAC	60%
Centrifugal pumps (80 cmh to 600 cmh)	70%
Centrifugal pumps (1 cmh to 10 cmh)	100%
PD Pumps (2 cmh to 40 cmh)	60%
PD Pumps (3 cmh to 5 cmh)	100%
MSB	100%
Steering Gear	97%
Fin Stabilizer	85%
Sighting system of BMP-II	100%
Sighting and Fire Control system of Tk T72	100%
Sighting and Fire Control system of Tk T90	68%
LCA	60%
Su-30MKI	60%
ALH	56%
Do-228	40%
Water tight, Weather tight doors	100%
Heli Landing Grids	50%
Steel Plates	100%
Long Range Surface to Air Missile & MultiFunction Surveillance and Threat Alert Radar (LRSAM & MFSTAR)	37.88%
VARUNA Electronic Warfare System	100%
Combat Management System (CMS)	100%
Advance Composite Communication System (ACCS)	100%
Ship Data Network (SDN)	100%
Fire Control System IAC-MOD-C	100%
Direction Finder NAYAN	100%
Integrated Bridge System (IBS)	40%
Indigenous Rocket Launcher (IRL)	100%
DMR 249A Steel Plate	100%

Source: 'Action Taken by the Government on the Observations/Recommendations contained in the Twenty-sixth Report of Standing Committee on Defence (17the Lok Sabha) on Demands for Grants of the Ministry of Defence for the year 2022-2023 on 'General Defence Budget, Border Roads Organisation, Indian Coast Guard, Defence Estates Organisation, Defence Public Sector Undertakings, Canteen Stores Department, Welfare (Demand Nos. 19 and 22)', Report number 40, August 2023, pp. 25–26.

This is a transitional arrangement, and should not suggest that the Indian government has a long-term policy of relying on foreign sources for critical technologies. India's defence ecosystem is actively encouraged to develop critical items domestically. The 'Policy for Indigenization of Components and Spares Used in Defence Platforms for DPSUs', announced by the DDP on 8 March 2019, is a key example of this commitment. The government also closely monitors the quality of domestically developed technology. Both the Parliamentary Standing Committee on Defence, and the government, assess the cost of developing indigenous products, and compare each to the price of procuring items from abroad to ensure that imported goods are not unreasonably expensive. Additionally, they monitor the indigenisation content of each item.

The Parliamentary Standing Committee on Defence has praised the new DPSUs for their efforts, noting that the indigenisation percentage of new DPSUs ranges from 100 per cent in the case of Troop Comforts Ltd and Yantra India Ltd, to 94 per cent for Advanced Weapons & Equipment India Limited. Munitions India Ltd. also has 95 per cent indigenised content.[25] The Committee further notes that 'India Optel Ltd. (IOL) has developed import-substituted products, and is on its way to achieving 100% indigenization.'[26]

Indigenisation is evaluated both in terms of value and the number of items. The process of indigenisation has been ongoing for a long time, either through these new DPSUs or their previous incarnations. These organisations have succeeded in indigenising numerous products, effectively reducing dependence on imports.

Infrastructure Development

As discussed, the DPSUs have adopted a mixed strategy, i.e., focusing on in-house innovation to develop new products while still relying on Original Equipment Manufacturers (OEMs) when necessary. The most critical task for achieving 'atmanirbharta' in defence is infrastructure development. The question arises: Are DPSUs contributing to this effort? The answer is yes, they are, and they are doing so in a phased manner. Old machinery is being replaced with new, state-of-the-art tools and equipment. Capacity expansion plans are underway to meet customer demands and boost indigenisation efforts, aligning with the 'Atmanirbhar Bharat' initiative. This expansion is aimed at manufacturing products based on either domestically developed technology or technology procured from abroad.

DPSUs are also encouraged to indigenise components and spare parts for major weapons systems. Realising this vision depends on sufficient budgets, skilled human resources, timely project approvals, and more. Product quality and the retention of manufacturing capacities are being enhanced through the integration of global technologies and advanced equipment. DPSUs have extensive modernisation plans to maintain product quality and capacity to meet the rigorous demands of the Indian Armed Forces. For instance, companies like MIDHANI have announced plans to develop increased melting capacity, followed by a conversion facility.

There should be a clear roadmap for the indigenisation of critical components, particularly for the newly created DPSUs, which were formed from OFBs, and are tasked with fulfilling specific objectives, which are:

- To enhance functional autonomy, efficiency and unleash new growth potential and innovation in Ordnance Factories.
- Improve flexibility and dynamism in decision-making in the functioning of Ordnance factories.
- Move away from an administrative pricing mechanism to a process of competitive pricing, bringing cost reduction for Armed Forces and paramilitary forces.
- Improvement in the quality of its products by enabling new entity to follow market-based quality practices.
- Better utilisation of capacities and assets of the OFB factories.
- Optimum utilisation of Human Resources.
- Timely supply to the Armed forces.
- Greater incentive for export with ability to retain export profits.
- To create profitable and self-sustaining arms production system in the country.
- The entity so created will have agility in absorbing ToT, besides forming Joint Ventures (JVs) with other countries including acquisition of foreign companies.
- To create surge capacity to meet war requirements.
- Increased turnover/profitability to lead to enhanced employment and better terms for employees.[27]

The modernisation of these DPSUs is expected to make them more competitive, allowing them to deliver the required quantity on time, and at a reduced cost. Measures such as multi-machine manning and the implementation of Business Intelligence Management software are enhancing their operational capacities. They are also diversifying their product lines to tap into new markets. Notably, these DPSUs have taken on the challenge of

securing orders not only for the Indian defence forces and internal security management but also from civilian organisations. Expanding their product offerings to non-defence applications will generate additional resources, enabling further refinement of existing products and innovation of new ones, thereby strengthening 'atmanirbharta'.

The government has also been implementing institutional innovations and adopting flexible approaches to increase the efficiency of DPSUs, ensuring that production scales up as needed, and the goal of self-reliance in defence is advanced. The DDP has already established a dedicated cell for this purpose, and the SRIJAN portal further aids indigenisation efforts. Additionally, the government has initiated autonomous organisations, like the National Institute for Research and Development in Defence Shipbuilding (NIRDESH), to promote self-reliance in warship and submarine construction. Within DPSUs, dedicated indigenisation cells have been established to accelerate the process at the unit level.

The government has been providing financial backing for the modernisation of their plants.[28] For instance, the Standing Committee on Defence, in its Demands for Grants for the Ministry of Defence for the year 2023–24, recommended Rs 1,310 crore for modernisation efforts,[29] a trend that continues. Additionally, these new DPSUs have been granted a certain level of financial autonomy to ensure modernisation takes place as needed. The government acknowledges the importance of supporting these new PSUs to ensure they can contribute effectively to the goal of self-reliance in the future.

Development/Use of Futuristic, Emerging High-technology

To meet the evolving needs of the Indian armed forces, the defence industry must continually develop and acquire emerging and futuristic technologies.[30] While the DPSUs rely on the DRDO for some support, they also have their own R&D centres and facilities,[31] which have been yielding tangible results. DPSUs recognise that, to remain relevant in a self-reliant India, they must focus on projects that contribute to advanced and emerging technologies. To achieve this, they engage in collaborative development projects, aided by initiatives such as the government's Make-II and iDEX programmes, which have proven valuable. Additionally, DPSUs have begun filing Intellectual Property Rights (IPR) for their R&D products, further securing their innovations. A significant portion of the Union Budget's Defence R&D

allocation is also designated for industry, including DPSUs, to undertake further research.

The PSUs are creating long-term strategic growth plans and aligning them with technology perspective plans to develop world-class, futuristic technologies and products. They are leveraging both in-house capacities and external collaborations, particularly with academic institutions, to enhance their technological edge.

The Department of Scientific and Industrial Research is another valuable resource DPSUs use to develop innovative and cutting-edge technologies. For example, DPSUs' structural engineering and materials science labs have contributed to both the creation of new products and the upgrading of existing systems. BEML, for instance, has successfully captured over 45 per cent of the metro segment market in India, competing against global giants like Alstom and China Railway Rolling Stock Corporation.

The government also encourages the new DPSUs to focus on in-house R&D for the design, development and enhancement of armaments, ammunition and equipment. The Ordnance Development Centres (ODCs) within these DPSUs focus on specific technological areas for R&D. These units collaborate with academic institutions, government laboratories and domestic private manufacturers on several R&D projects. Key ongoing developments include drone-assisted delivery systems, terminal guided munitions, guided bombs, 70mm rockets, indigenisation of nuclear radiation and chemical warfare agent detectors for the T-90 tank, automatic gear shifters for the T-90 Bhishma tank, electronic point detonation fuzes for artillery ammunition, the Parachute Tactical Assault Gajtaj-2 system (PTA G-2), area denial munitions (DPICM Pinaka) and the Military Combat Parachute System (MCPS).[32] The R&D spending of the new DPSUs has increased significantly since 2021–22.[33]

In the realm of artificial intelligence, *Gliders India Limited* (GIL) is actively engaged. It aims to leverage AI to address various challenges. According to its annual report, the projects in development include an AI-based parachute fabric inspection machine, AI-based webbing and tape systems, and an AI-based intrusion detection system for perimeter security. The teams are working enthusiastically to achieve these goals within their timelines.[34] Moreover, in collaboration with IIT Madras, Mazagon Dock Shipbuilders Ltd (MDL) has supported start-ups that are developing three innovative AI projects:[35]

- An AI-enabled robotic weld inspection tool using phased array technology to replace manual radiography.

- An AI-enabled robotic weld inspection tool using phased array technology to replace computerised radiography.
- An AI-enabled Remotely Operated Vehicle.

Skilled Human Resources

In countries like the US, migration plays a crucial role in sustaining the technical workforce. Other Western nations also rely on the global human resource market to replenish their technical talent. In contrast, countries like India, where indigenisation is a priority, require a trained national workforce, especially for entities with limited funding. While some private companies in India do recruit skilled workers from the global market, competitiveness often necessitates cost-effective human resource management.

A steady supply of skilled human resources is a critical step towards the indigenisation of defence production. In India, a developing economy, the technical workforce typically seeks job security, something that DPSUs have been able to provide. These DPSUs actively hire and further train the technical workforce[36] to advance their self-reliance goals.

However, the defence industry, including DPSUs, now faces the challenge of competing in a rapidly evolving global environment, which requires a highly skilled workforce, capable of managing modern technology at a faster pace. While reliance on international talent is an option, the most effective and economical solution is to invest in skilling the domestic workforce. The private sector and foreign firms offer flexible pay packages, giving them an advantage, but DPSUs counterbalance this with the security of tenure, a significant draw for talent in India. Although DPSUs experience high attrition rates among technically skilled workers, their large talent pool mitigates this impact.

A crucial aspect of DPSUs' skilling policies is their recruitment and training of individuals from marginalised communities, enabling them to contribute to India's defence self-reliance mission. This inclusivity provides a strong foundation for the 'Atmanirbharta' (self-reliance) policy by involving stakeholders from across society.

To build core competencies within their workforce, DPSUs are adopting various initiatives aligned with the Government of India's push for 'atmanirbharta'. One of their key strategies has been to reduce unproductive labour while progressively developing a tech-savvy workforce to handle high-tech projects. For example, Bharat Electronics Limited (BEL) has formed a Corporate Cost Reduction and Indigenisation Review

Committee, which regularly evaluates the skill levels of employees working on high-tech projects. Currently, 50 per cent of BEL's workforce is engaged in R&D activities, focused on designing and developing future technologies indigenously.

DPSUs are also collaborating with reputable national and international institutions to provide technical and managerial training to their employees. Workers attend advanced technical courses at leading institutions, like the Indian Institutes of Technology (IITs) and the Indian Institute of Science (IISc), while also participating in professional development programmes at top business schools, such as the Indian Institutes of Management (IIMs) and XLRI. Many employees even take sabbaticals to pursue doctorates, further deepening their expertise.

MDL, for instance, has signed Memoranda of Understanding (MoUs) with academic institutions to facilitate skill enhancement for its executives. These R&D initiatives are expected to strengthen indigenous warship-building capabilities and significantly contribute to India's technological self-reliance in defence.

Export

Exports are a vital component of India's Atmanirbharta initiative,[37] particularly in the defence sector. Collaborations with foreign companies and nations are aimed at boosting the export of defence goods, which not only generates foreign exchange but also builds India's brand in the global arms market. While India has had policies and regulations governing defence exports for years, recent reorientations have placed a greater emphasis on expanding this sector. The core principle of the export policy is to limit exports to friendly nations or, at the very least, non-hostile countries. Although India's defence exports were previously limited, the focused policies of recent years have resulted in a significant increase.[38] This push for exports is not intended to exacerbate domestic or regional conflicts, nor to unethically enrich a Military–Industrial Complex, as seen in some Western countries. The government actively encourages DPSUs to pursue exports in compliance with Indian laws and regulations.

To further enhance exports and business development, regular high-level review meetings are held at the Ministry of Defence. Incentives such as Lines of Credit under the Atmanirbharta policy have greatly propelled India's defence export orientation. DPSUs, like Goa Shipyard Limited (GSL), have set up specialised groups, such as the 'Export Promotions & Strategic

Projects' group, to comply with government policy. Defence Attachés in Indian embassies abroad also play a key role in boosting exports. Additionally, DPSUs participate in international exhibitions to showcase their products, and New Business Development Divisions have been established to expand customer bases, and improve coordination with potential clients.

A growing number of countries are now importing Indian defence products. For instance, BEL exports to 51 countries[39] across multiple continents. Hindustan Shipyard Limited (HSL) is focusing on export orders in India's neighbourhood, extending into Southeast Asia.[40] Mazagon Dock Limited (MDL) has exported commercial vessels like cargo ships, to Singapore and the UK, water carriers to Iran, barges to the Middle East, police boats to Mozambique, and various other vessels to countries like France, Mexico and the Bahamas.[41] Garden Reach Shipbuilders & Engineers (GRSE) was the first DPSU to sell a warship internationally, and has also exported to Guyana (an Ocean-Going Cargo cum Passenger Vessel), Bangladesh (patrol boats and modular steel bridges), Seychelles (Fast Patrol Vessel 'SCG PS Zoroaster'), Nepal (Portable Steel Bailey Bridges) and Bhutan (Portable Steel Bailey Bridges).[42] The GSL has won a contract for constructing 4000 T Floating Dry Docks for the Sri Lanka Navy.[43]

The newly formed DPSUs are also actively engaged in defence and civilian exports, making significant progress compared to the OFB. They are receiving orders from new countries as well. Troop Comforts Limited (TCL) has focused on selling its products in Nepal, while Advanced Weapons and Equipment India Limited (AWIL) has delivered 14.5 mm artillery trainers to Egypt.[44] Munitions India Limited (MIL) has exported to countries such as Morocco, Uganda, Nigeria, the UK, Armenia and the Czech Republic.[45] Yantra India Limited (YIL) has clients in Spain, Israel, Myanmar, Slovakia and Italy,[46] while India Optel Limited (IOL) is concentrating on exporting equipment, like T-72, T-90, and BMP-II, to friendly nations. It received inquiries from the UAE regarding the export of missile sites, and the first batch of nine sets has been successfully delivered. [47]

Indian DPSUs have also gained attention for exporting advanced systems, such as the Dornier-228 aircraft, BrahMos missiles and Pinaka rocket launchers. Additionally, they offer less-publicised exports like artillery guns, radars, simulators and armoured vehicles, as well as Maintenance, Repair and Operations (MRO) services. Some DPSUs, like BEL,[48] have well-established export portfolios, while others prioritise domestic demand. Mishra Dhatu Nigam Limited (MIDHANI) has begun exporting superalloys, special steel and titanium alloys after successful trials, which is expected to

further boost its order book. Munitions India Limited (MIL) has exported various ammunition types, including the 7.62 X 39 mm, 7.62 X 54 mm and Pinaka rockets (Pinaka Mk1, Pinaka Enhanced and Pinaka Guided), along with MIL-17 Grenade, MIL-25 Grenade, BMCS M92 charge, Charge 8, PDM 557 Fuze, ERFB BB Shells.[49] YIL has exported items such as 105mm TP-T rounds and aerial bombs. Some of the listed export items of the YIL are: Tail Units, 122mm Forged Steel Tube, Shell 155mm M107, Shell 155mm L15A1, CC 105mm 148A1 and CC 105mm 148L.[50] The increase in exports, combined with the rise in indigenous defence production, helps India conserve foreign currency (Table 4).

Table 4 Defence Exports

Year	Export Authorisations to Private Companies (Rs Cr)	Export by DPSU/7 New of Companies (Rs Cr)	SCOMET Issued by DGFT (Rs Cr)	Contract Values (Rs Cr)	Total Export (Rs Cr)
2016–17	194.35	1327.51	0.00	0	**1521.86**
2017–18	3163.16	1519.20	0.00	0	**4682.36**
2018–19	9812.91	932.86	0.00	0	**10745.77**
2019–20	8007.81	904.74	203.00	0	**9115.55**
2020–21	7271.25	984.64	178.94	0	**8434.83**
2021–22	5965.03	386.19	6.70	6456.60	**12814.52**
2022–23	9050.84	385.78	351.28	6130.26	**15918.16**
2023–24	13119.03	109.13	2090.44	5764.78	**21083.38**
2024–25	5283.99	25.76	0.00	4963.83	**10273.58**

Source: "Dashboard", Department of Defence Production, Ministry of Defence, Government of India, available at https://ddpdashboard.gov.in/DefenceExport/Defence_Exports, accessed on 25 September 2024.

Once primarily known for importing defence goods, India is now making significant strides in the arms export business. Over the past decade, the total export of defence items has increased 31-fold, with a growth rate of approximately 32.5 per cent in the last year alone.[51] DPSUs have played a key role in this expansion, contributing significantly to the country's defence export portfolio. In 2023–24, DPSUs exported defence items worth around Rs 8,500 crore, accounting for 40 per cent of the country's total defence exports under Category 6 of the Special Chemicals, Materials, Equipment

and Technologies (SCOMET) list.[52] Licenses for these items are issued by the DDP.

However, DPSUs and other Indian companies also produce items listed in other categories of SCOMET, including dual-use technologies. If these additional items are included in the export figures, the total value of exports by Indian companies, including defence-related products, would be even more impressive. Currently, the government's defence export data only accounts for items listed under SCOMET Category 6.

Supply Chain Resilience

Supply chain resilience is essential for the sustainability of any economy, and its importance is being recognised globally. In the defence industry, this resilience is crucial; without it, armed forces may not receive weapons on time, which can leave them vulnerable. Delays, or the unavailability of critical equipment, can also increase project costs. Achieving self-reliance in weapons production depends on a robust and reliable supply chain, one that must be reinforced by domestic sources to ensure sustainability.

DPSUs are playing a key role in strengthening the domestic supply chain. They do this by placing orders with Indian vendors, both large and small, for components and sub-systems. The Indian government places significant emphasis on synergy between DPSUs and vendors to achieve an 'Atmanirbhar Bharat' (self-reliant India) in defence. Many DPSUs publicly display their policies on their websites, demonstrating transparency and commitment to domestic partnerships.

For example, BEL[53] provides detailed information on the expansion of its domestic vendor base, offering online vendor registration, and outlining its outsourcing and vendor development policy. The BEL website also contains notifications related to 'Make in India', such as procurement details for Indian vendors, lists of items for indigenisation, and collaborative research and development (R&D) opportunities with private industries. BEL has also appointed nodal officers to promote the 'Make in India' initiative.

Similarly, HAL[54] has outlined its outsourcing policies, the registration process for vendors and services it offers to the private sector.[55] These services include access to test facilities[56] for private companies. BDL provides similar information and has implemented special norms and incentives for MSMEs and start-ups.[57] Other DPSUs[58] have also developed inclusive policies that actively engage Indian vendors, especially MSMEs and start-ups, to contribute to India's self-reliance in defence production. Even newer

DPSUs are involving domestic vendors to support the 'Atmanirbhar Bharat' initiative.[59]

In shipbuilding, DPSUs are sub-contracting tasks such as hull fabrication and equipment outfitting to domestic vendors. This strategy fosters public–private partnerships, promoting indigenous warship construction. Indigenous sources are clearly playing a key role in enhancing the resilience of India's defence supply chain. Several studies have endorsed the progress made in this area.

The Defence Investor Cell of the DPP has been actively engaging with Indian vendors, addressing their grievances and promoting defence procurement. This body believes that the transformation of ordnance factories into new DPSUs will create 'productive and profitable assets, improve expertise across a broader product range, enhance competitiveness and quality, and increase cost-efficiency.'[60] All of these factors will contribute to the long-term goal of self-reliance in India's defence sector.

Challenges and the Way Forward

The DPSUs are encountering several challenges in their pursuit of achieving full 'atmanirbharta' (self-reliance) in defence production. A report from the Parliamentary Standing Committee on Defence has examined these challenges in detail, though there are additional issues that remain unlisted or undiscussed. Even three months after the report's presentation, many of the highlighted problems persist. However, the summary provided within the report itself offers valuable insights into the obstacles that DPSUs are currently facing on their path to self-reliance in defence. The report says,

> The Committee find that several challenges are being faced by the DPSUs which inter alia include shortage of semi-conductor chips, delayed clearances by stakeholders in Turnkey projects, retention of talent, procurement through Government e-Marketplace (GeM), supporting platforms for a long duration which involves high cost, extensive testing and economy of scale, competition from long term established players in export market, idling of facilities and resources, delay in projected timelines due to COVID-19, volatility in price of imported input raw material, volatile & limited availability, pending permission from Foreign Original Equipment Manufacturers (FOEMs) to export missiles. The Committee recommend that urgent and intensive focused efforts from the Ministry and the DPSUs are required in order to ensure that the DPSUs, besides fulfilling the

> requirements of the Armed forces, are able to achieve their targeted level of production and profits. The Committee desire that concrete measures be initiated/taken by the Ministry and the DPSUs to address and resolve each of the said bottlenecks being faced by the DPSUs and the outcome thereof may be apprised to them within three months of the presentation of this Report.[61]

Various reports from the Indian Parliament's Standing Committee on Defence have raised concerns about the order books of DPSUs. Many reports acknowledge that this issue affects several DPSUs, including prominent ones like HAL and BEML.[62] However, HSL, MIDHANI, and some of the newer DPSUs have been specifically identified for their particularly low order books. One report highlights a 'steep decline in the order book position for the next five years' [63] for certain new DPSUs. For instance, a committee report states, 'There is "NIL" order book position registered for TCL from 2026–2028. The same position exists for MIL during this period. GIL also has "Nil" orders for 2027–28.'[64]

The issue of underutilisation of production facilities in DPSUs is closely tied to their low order book problem. A report from the Parliamentary Defence Committee states: challenge of underutilisation of production facilities and other resources in the coming years is also being faced even by well-performing DPSUs, such as HAL. The Committee also understand that due to complexities involved in the defence procurement process, the translation of an Acceptance of Necessity (AoN) into a concrete order for DPSUs takes time. Therefore, in order to ensure that the DPSUs maintain a healthy order book position, the Committee recommends that timely placement for orders and other requirements by the Services and long-term planning for maintaining financial viability of the DPSUs should be carried out by the Ministry, in consultation with the DPSUs.[65]

In 2023, another report from the Standing Committee on Defence emphasised the declining export potential of DPSUs, particularly the newer ones. Some DPSUs have explained that this underperformance in exports is due to several reasons. While the government has provided operational guidelines, stronger networking among DPSUs is necessary. It is recognised that expanding exports may help some DPSUs survive, especially given the lack of sufficient domestic orders. These DPSUs are vital for India's defence preparedness, and their export performance needs significant improvement.

The committee also recommended that the Ministry of External Affairs (MEA) support the promotion of DPSU products, both for civilian and

military applications,[66] at international exhibitions. However, this approach has not been very effective so far, as diplomats may not have the expertise to successfully promote and sell defence products. A more professional and specialised cell, possibly through the DDP, is needed to facilitate exports, and help DPSUs navigate the final hurdles in securing deals.

For the newer DPSUs, better export performance is especially critical. They are already struggling to secure orders from the armed forces, and are now trying to engage with other government bodies, such as the Ministry of Home Affairs, and the civil sector to expand their customer base. Exploring export opportunities will be key to boosting their production capacity and relevance. Given their importance to national defence during wartime, it is vital to reinforce these DPSUs and ensure they can tap into both domestic and international markets.

Despite years of efforts by both DPSUs and successive governments, including the Modi administration, the issue of high import content in production remains a concern. DPSU leadership needs to address this issue swiftly. Specific challenges include the uncertainty of using indigenised items in certain projects, insufficient order volumes for developers and the lack of technical documentation from collaborators, all of which hinder supply from domestic sources.

Many within India's policy circles rightly emphasise the need for synergy among all stakeholders involved in the 'Atmanirbhar Bharat' mission. This will help reduce imports, promote export opportunities, and strengthen the Indigenisation Cell within DPSUs. This cell has the potential to play a crucial role in indigenising key equipment and components necessary for defence projects, further contributing to the self-reliance initiative.

Conclusion

The 'Atmanirbharta' mission has presented a significant opportunity for DPSUs to reorganise their operations and set new objectives in response to evolving global and domestic circumstances. For decades, DPSUs have been dedicated to the goal of self-reliance. Entities like BDL, which has been involved in missile production under global strategic restrictions, have built strong ecosystems capable of producing strategic items essential for national defence. With the 'Atmanirbharta' mission, these DPSUs can renew their commitment and align themselves with emerging global opportunities.

DPSUs are employing a mixed strategy to enhance their capabilities. They are forming MoUs with various institutions, including academic bodies, foreign defence organisations and private companies. This enables them to acquire external technologies while ensuring timely delivery of quality weapons to the armed forces. By adopting this strategy, DPSUs have strengthened their ability to produce world-class weapons, both for domestic use and for export. This approach is particularly applied to critical items that are not available domestically. At the same time, DPSUs are working on in-house R&D projects, and collaborating with domestic government and private organisations to indigenise technologies, components and systems, ultimately leading to the innovation of new products.

To meet these new challenges, DPSUs are also modernising their infrastructure. The expansion of their production capacity has contributed to the success of the 'Atmanirbharta' initiative, despite some budgetary constraints. Nevertheless, they have made significant progress in indigenising products. Furthermore, DPSUs have strengthened the domestic supply chain by integrating MSMEs, start-ups and other private sector firms. These partnerships have been particularly fruitful, as many start-ups have early ties to DPSUs. However, enhanced synergy among various actors—government, private sector and research bodies—could further accelerate the progress towards the 'atmanirbharta' goal.

In addition to their domestic contributions, DPSUs are playing a key role in boosting India's export profile. While some newer DPSUs may not yet have the strength of older PSUs, which often produce high-end products that attract export interest, these new entities are also securing export orders and crafting export strategies. They are targeting not only neighbouring countries but also markets in other regions across the globe. The ambitious export targets set by the Indian government can be significantly advanced with strategic intervention from DPSUs.

However, several internal and external challenges remain for DPSUs, which need to be tackled to ensure sustained success. Capacity building—not just incremental but substantial—is critical for the realisation of 'atmanirbharta'. This requires appropriate budgeting, as budgetary constraints can hinder planning for skill development, which is vital for indigenisation. Furthermore, India's export potential may not be fully realised if DPSUs do not operate at full capacity. Lastly, regulatory and procedural barriers must be removed to ensure the successful implementation of the 'Atmanirbharta' mission in the defence sector.

Annexure: DPSUs

HAL began its journey as a private company named Hindustan Aircraft Limited, established by Seth Walchand Hirachand in 1940. By 1942, the government of India took over the management of the company and, in 1964, the current company came into being when the Government of India merged Hindustan Aircraft Limited and Aeronautics India Limited. The HAL has joint ventures with national and foreign companies such as Safran HAL Aircraft Engines Pvt. Ltd, and Samtel HAL Display System Ltd. Its products include fighter and other military aircraft, civil aviation, helicopters and items for the space programme. The joint ventures, such as Safran HAL Aircraft Engines Pvt. Ltd, act as a 'Centre of Excellence for [the] production of Precision Aero engine components and assemblies as an Export Oriented Unit'.[67] And, Samtel HAL Display System Ltd undertakes design, development and manufacturing of a variety of 'display systems for Airborne, Military and ground applications for sale in India and International markets'.[68] DPSUs have been encouraged to be aware of Intellectual Property Rights (IPR) regarding their products.[69] In a joint venture, generally, the IPR is shared in proportion to the share each partner holds. That Safran's IPR will remain in India has been stated very categorically by HAL.[70]

Bharat Electronics Limited (BEL) was started in 1954 to provide military electronics to the country for its defence needs. Since then, it has been manufacturing electronic products and systems, such as radars and simulators for the Army, Navy and the Air Force. Over the years, it has diversified its activities, and supplies its electronic products to internal security, cyber security and space activities. Besides, it has extended its activities to the civilian spheres, such as railways, airport, solar and health management. Its Electronic Voting Machine has enhanced the democratic credentials of India as a nation using modern methods.

Bharat Dynamics Limited (BDL) came into being in 1970, after its incorporation as a PSU. The BDL is known for making the country a missile power in the highly sophisticated categories for which it had to bear the brunt. The Integrated Guided Missile Development Programme is the best-known project the company was associated with. The missiles of different ranges, including the Akash systems, the quick reaction surface to air missile, the medium range surface to air missile, and different antitank guided missiles, the light and heavy weight torpedoes, sensor systems are some of the well-known products of the BDL.

BEML Limited (formerly Bharat Earth Movers Limited) was started in 1964 as a PSU for 'rail coaches & spare parts and mining equipment'. Although it continues with its railways & Metro, and mining & construction segments or verticals, it has spread its activities in defence & aerospace quite successfully. It manufactures different variations of vehicles for all terrain manoeuvres. Over the years, it has helped Indian defence with its products—the Prithvi Missile Launcher, the Pinaka Multi Barrel Rocket Launcher, Mounted Gun systems, Aircraft Towing Tractors, Aircraft Weapon Loading Trolleys, Mine Ploughs, Pontoon Bridge Systems, Heavy Duty High Mobility Vehicles, Armoured Recovery and Repair Vehicles, and so on.

Mishra Dhatu Nigam Limited (MIDHANI) came into being in 1973. The objective of establishing the MIDHANI was 'to achieve self-reliance in production and supply of various super alloys, special steels, soft magnetic alloys, to Defence and other Strategic Sectors such as Energy, Space and Aeronautical applications'.[71] It has produced different qualities of Nickel, Cobal, and Iron alloys. It has also created four grades of Titanium and Titanium Alloys: Unalloyed or commercially pure titanium; Alpha and near alpha alloys; Alpha-plus-beta alloys; and Beta-alloys. It has also specialised in producing special steel, and many products for defence and non-military uses. However, more than 70 per cent of the products of the MIDHANI are supplied to the strategic sector.[72]

Mazagon Dock Shipbuilders Limited (MDL) started as a private limited company in 1934, but its preparatory work had been done much earlier with the construction of a tiny dry dock. In 1960, the company was taken over by the government, which converted it to a leading war-shipbuilding yard of the country. The MDL has the credit of building 'total 801 vessels including 27 warships, from advanced destroyers to missile boats, and 7 submarines'[73] since the taking over by the government. This DPSU has also produced cargo ships, passenger ships, supply vessels, multipurpose support vessel, water tankers, tugs, dredgers, and fishing trawlers, among many other products.[74]

Garden Reach Shipbuilders and Engineers Ltd. (GRSE) had its origin in the 19th century. In 1884, a small River Steam Workshop was set up to do the repair work of the vessels and river craft of the British India River Steam Navigation Company. That workshop had passed through different phases before it was taken over by the Indian government in 1960. As the GRSE it has been delivering several products for maritime security and commercial uses. It was the first Indian company to construct a warship—the Seaward Defence Boat (SDB) INS Ajay—in 1961 for the Indian Navy. It has also exported warships.

Goa Shipyard Limited (GSL) was started in 1957. After the liberation of Goa in 1961, the GSL got a major boost. Its earlier incarnation in a small shipyard, called 'Estaleiros Navais de Goa', provided some foundation station on which the current company is functioning. Ever since its incorporation, the GSL has been trying to solve the problem of specialised shipbuilding. It has produced a range of high-level but varied classes of vessels and fast interceptor boats. Mine Counter Measure Vessels, Advanced Offshore Patrol Vessels, medium & high-speed patrol boats, damage control simulators, and so on, are some of its prominent products.

Founded in 1941, and strategically positioned on the east coast of India at Visakhapatnam, Andhra Pradesh, Hindustan Shipyard Ltd (HSL) is the country's leading shipbuilding organisation. It serves a broad range of needs, including shipbuilding, ship repairs, submarine construction and refits, and the design and construction of advanced offshore and onshore structures. HSL's extensive experience, gained from building 200 vessels, refitting five submarines and repairing 2,000 various types of vessels over the years, equips it to provide proficient services for the defence and maritime sectors.

Headquartered in Kanpur, Advanced Weapons and Equipment India Limited (AWEIL) operates eight factories located in Kanpur, Cossipore, Jabalpur, Korwa, Tiruchirappalli and Ishapur. The company specialises in producing weapons and equipment of various calibres, ranging from small to large. In 1775, British authorities approved the creation of the Board of Ordnance at Fort William, Kolkata, marking the formal beginning of Army Ordnance in India. A gunpowder factory was set up at Ishapore in 1787, starting production in 1791 (later becoming the site of the Rifle Factory in 1904). In 1801, the Gun Carriage Agency was established at Cossipore, Kolkata, now known as the Gun & Shell Factory, Cossipore, which began production on 18 March 1802. This was the first industrial establishment of an Ordnance Factory, which has remained operational to this day.[75]

Gliders India Limited (GIL), a Government of India enterprise, established on 14 August 2021, is a wholly-owned DPSU. Currently, the company is proficient in manufacturing a diverse range of parachutes, floats, inflatable boats and accessories as part of the Government of India's 'Atmanirbhar Bharat' initiative. Additionally, it is expanding into the civilian adventure, recreation and sports markets by offering various para-gliders, para-sails, support equipment, and civilian rescue solutions for people, and drones. Its origin may be traced to the Ordnance Parachute Factory started in the year 1941 in Kanpur, as a repair unit for the Man Carrying parachute.

Troop Comforts Limited (TCL) also came into being when the OFB was reconstituted in 2021. It serves the needs of Indian defence and Home Affairs agencies. It has been manufacturing a wide range of clothing items and accessories—from uniforms and general supplies to technologically advanced products. The products of TCL help soldiers cope with the situation from glaciers to deserts.

Armoured Vehicles Nigam Limited (AVNL) is yet another new DPSU which has come into existence after the reconstitution of the OFB. It manufactures Tank T-72 for Trawl, T-72 Bridge Layered Tanks, MBT Arjun, CIA Ajeya T72, infantry combat vehicles, logistic vehicles, artillery gun systems such as 14.5 Mm Artillery Trainer, and some naval systems. Armoured Engineering Reconnaissance Vehicles, Nuclear Biological Chemical Reccee Vehicles, Mines Protected Vehicle Upgraded Version, Carrier Mortar Tracked, Sarath BMP-II, and so on, are its well-known products.

Another new PSU formed from the OFB is Munitions India Limited (MIL) which is, arguably, India's largest producer and market leader in the production, testing, R&D and marketing of a wide array of ammunition and explosives for the Army, Navy, Air Force and paramilitary forces. MIL boasts a well-established, integrated production base for small, medium and high-calibre ammunition, mortars, rockets and hand grenades, including the in-house manufacturing of initiatory compositions, propellants and high explosives for over 150 years. It operates 12 manufacturing units.[76]

Yantra India Limited (YIL) is another newly established PSU that emerged in 2021 through a similar reorganisation. It operates eight factories that produce a variety of items, including 120mm and 81mm mortars, various types of fuzes, aircraft rockets, assault bridges and numerous aluminium alloy components for both the Indian defence and aerospace sectors.[77]

India Optel Limited (IOL), established in 2021 like other new PSUs from the Ordnance Factory Board (OFB), has its roots in the Ordnance Factory, Dehradun (OF Dun), originally conceived in 1941 when the Mathematical Instruments Office was moved from 15 Wood Street, Kolkata. IOL aims to achieve self-sufficiency in optoelectronics solutions for the Armed Forces, Paramilitary Forces under the Ministry of Home Affairs, and other customers. Its product range includes the Thermal Imaging Sight 'TI-ESSA' for the T-90S tank, the Commander's Vision and Sighting System PNK-4S for the T-90S tank, the Anti-Aircraft Sight PZU-7 for the T-90S tank, the Fire Control System 1A43 for the T-90S tank, and the Gunner's Sight TPD-K1 for the T-72 tank, among others.[78]

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