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THE DEFENCE INDIGENIZATION CHALLENGE

Dr. Samuel C. Rajiv

Abstract

The sum total of the significant policy initiatives taken by the Ministry of Defence to achieve self-reliance and promote indigenization will add volumes to the domestic defence industry, as well as provide significant economic benefits, like employment generation, among others. Going forward, the challenge for the domestic defence industry is to enhance its technological value proposition, by adopting and creating technologically-driven solutions and equipment, for the domestic as well as global markets.

The Indian defence sector is poised for a major transformation. The Government of India has taken a series of steps to promote defence indigenization – also termed as ‘Atmanirbharta’ or self-reliance, in the recent past. The most significant among these steps have included the promulgation of the two positive indigenization lists, establishment of the defence industrial corridors in Uttar Pradesh and Tamil Nadu and the creation of a separate capital acquisition budget for the domestic industry, among others. This Note highlights key aspects of the above steps and places in perspective some of the challenges associated with realizing the full potential of the initiatives related to defence indigenization, specifically research and development (R&D) and the role of the private sector.

Steps to Promote Defence Indigenization

A ten-year national mission to enhance self-reliance in defence systems was launched in 1995, to increase the indigenous content (IC) in defence acquisitions. Various iterations of the Defence Procurement Procedures (DPP), till 2016, provided for significant policy interventions like offsets, and mandatory IC in acquisitions, among others. The Defence Acquisition Procedure (DAP) 2020 further increased the mandatory IC requirement for different categories of procurement. A new procurement category, Buy (Global-Manufacture in India) was created with an IC requirement of 50 per cent, in the
DAP 2020. Most categories of procurement now require a minimum of 50 per cent IC (other than Buy-Global category, wherein, the IC is 30 per cent).¹

<table>
<thead>
<tr>
<th>Year</th>
<th>Public sector production</th>
<th>Percentage of production (public sector)</th>
<th>Private sector production</th>
<th>Percentage of production (private sector)</th>
<th>Total defence production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-17</td>
<td>59,950</td>
<td>80.95</td>
<td>14,104</td>
<td>19.04</td>
<td>74,054</td>
</tr>
<tr>
<td>2017-18</td>
<td>63,473</td>
<td>80.52</td>
<td>15,347</td>
<td>19.48</td>
<td>78,820</td>
</tr>
<tr>
<td>2018-19</td>
<td>63,770</td>
<td>78.61</td>
<td>17,350</td>
<td>21.39</td>
<td>81,120</td>
</tr>
<tr>
<td>2019-20</td>
<td>63,177</td>
<td>79.89</td>
<td>15,894</td>
<td>20.11</td>
<td>79,071</td>
</tr>
<tr>
<td>2020-21</td>
<td>67,466</td>
<td>79.59</td>
<td>17,294</td>
<td>20.41</td>
<td>84,760</td>
</tr>
</tbody>
</table>


As Table I indicates, the overwhelming percentage of domestic defence production is by the defence public sector. The Draft Defence Production and Export Promotion Policy (DPEPP) 2020 – which is expected to be finalised and formally released in the near future, aims to make India one of the leading countries in the world in the defence and aerospace sectors. This, it plans to do with the active involvement and participation of both the public and the private sectors, to achieve the twin objectives of ‘self-reliance’ (defence indigenization) and exports. The policy seeks to achieve a defence production capacity of $25 billion (Rs 175,000 crores) and defence exports of $5 billion (Rs 35,000 crores) by 2025.²

As noted in Table I, India’s defence production in 2020-21 was about Rs 85,000 crores. This is, no doubt, a significant increase of more than six times

from the volume of domestic defence production two decades ago, which stood at about Rs 14,000 crores during 2000-01. Even so, the country’s defence production capacity, has to more than double from the current levels in the next four years, if the ambitious targets as set out in the DPEPP 2020 have to be achieved.

The MoD, has taken critical steps to realize these objectives in the near to long terms. The two indigenization lists promulgated in August 2020 and May 2021, are a significant step in this direction. Cumulatively, the lists contain 209 items, including platforms and high-technology equipment, which will be Made in India, going forward. The MoD estimates that over Rs 350,000 crores worth of such equipment will be procured from the domestic industry, over the next five to six years.

In a big fillip to the private sector, the Government in March 2022 agreed to fund product design and development under Make I category of the DAP 2020, when it approved four projects. This marked the first time that the MoD agreed to provide financial support for the design and development of products by the private sector. The equipment includes platforms like a light tank for the Indian Army and communication equipment for the Indian Air Force (IAF). Five other projects were also approved for the industry-funded Make II category. These related to autonomous combat vehicles and surveillance systems for the Indian Army and simulators for the IAF.

The Srijan defence indigenization portal, which was activated in August 2020, is a worthwhile initiative to promote defence indigenization. The portal lists items which have been procured from foreign original equipment manufacturers (OEMs) by the DPSUs, ordnance factories and Service headquarters. The domestic industry is encouraged to engage and partner with the private sector in order to assist in the indigenization efforts of the MoD. The

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3 Make I category projects are those where up to 70 per cent of development costs are borne by the Government.
domestic industry can either design, develop or produce the equipment on their own or through joint ventures with the OEMs.

The Srijan portal flows from the March 2019 *Policy for the Indigenisation of Components and Spares used in Defence Platforms for DPSUs/OFBs*. The Policy document notes that the value of components imported by the DPSUs/OFBs during 2017–18 was nearly Rs 14,000 crores. The aim is to reduce the import bill of the DPSUs on this count. The MoD specifically pledges to support the development of capabilities related to engine technology, materials technology and electronic chip technology. It will also give priority to indigenized components for testing and evaluation and encourage their exports.⁴

More than 18,000 products, imported during the period 2018–21, have been listed on the Srijan portal, for indigenization by the target year 2025–26. As on February 2022, the Indian industry has shown interest for indigenization of nearly 4,000 items; out of these, more than 3,000 items have already been indigenized. To take the specific example of India’s imports from a key strategic partner like Israel, the quantum of defence imports, of products and equipment currently being imported, will reduce to the tune of at least Rs 7,000 million (Rs 700 crores or about US$ 95 million), if the indigenization efforts of the MoD in conjunction with Indian industry, the DPSUs and ordnance factories fructifies, as seen in Table II below.

<table>
<thead>
<tr>
<th>DPSU</th>
<th>Imported product</th>
<th>Import Value of product (since 2017-18) and Projected requirement (in Rs Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEL</td>
<td>Electronic modem for ETC</td>
<td>701.2</td>
</tr>
</tbody>
</table>

Table III
MoD Contracts to Domestic Defence Industry
(In crores)

<table>
<thead>
<tr>
<th>Year</th>
<th>Procurement from domestic industry</th>
<th>Percentage of procurement from domestic industry</th>
<th>Procurement from foreign sources</th>
<th>Percentage of procurement from foreign sources</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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The MoD has also, in recent years, given the maximum percentage of contracts to the domestic defence industry, as against procurement from foreign sources. As Table III indicates, nearly two-thirds of the contracts are being given to domestic industry currently, as compared to around 54 per cent, about four years ago. The percentage of procurement from foreign sources was as high as 52 per cent during 2013-14.
Further, the Buy Indian-Indigenously Developed, Designed and Manufactured (IDDM) procurement category, introduced in the DPP 2016, has been given the highest priority in DAP 2020. In 2020-21, Acceptance of Necessity (AoN) for projects worth Rs 75,000 crores ($10 billion) was given for IDDM proposals. From 2016 onwards till 2020, AoN was issued for 86 Buy-IDDM schemes worth over Rs. 93,000 crores. Cumulatively therefore, proposals worth Rs 168,000 crores have been accepted under this procurement category.

A separate domestic capital acquisition budget of Rs 52,000 crores was earmarked in the defence budget 2020-21. This was increased to Rs 71,438 crores in 2021-22. The draft DPEPP 2020 document calls for enhancing domestic capital procurement allocation by a minimum of 15 per cent every year. The actual increase in the domestic capital procurement allocation, therefore, was more than double of that suggested by the draft DPEPP 2020. In the defence budget 2022-23, the percentage of the capital budget earmarked for domestic procurement further increased to Rs 84,598 crores, i.e., 68 per cent of the total capital acquisition budget.

The two defence industrial corridors in Uttar Pradesh and Tamil Nadu are expected to attract a cumulative investment of Rs 20,000 crores by 2024-25. Currently, investments of approximately Rs 3,750 crores have been made in these corridors by both the public and private sector companies. Among the significant industrial MoUs that the Uttar Pradesh Expressway Industrial Development Authority (UPEIDA) – which manages the UP defence industrial corridor (DIC) – has signed includes those with Bharat Dynamics Limited, Brahmos Aerospace and Bharat Forge, among nearly 40 defence companies. Some of the significant joint ventures in the Tamil Nadu defence corridor – which was inaugurated in January 2019 – include those by the French missile maker MBDA and Larsen and Toubro – to make missiles for the Rafale fighter aircraft, Boeing and Laxmi Machine Works, as well as by DPSUs like Bharat Electronics Limited.
As for foreign direct investment (FDI) in the defence sector, during 2001-2014, India received about US$ 180 million. From 2014 onward still 2020, this figure escalated to US$ 470 million. Another US$ 100 million was received by 2021, for a cumulative amount of US$ 570 million (Rs 4,200 crores) during 2014-2021. Nearly US$ 400 million (Rs 2,900 crores), therefore, has been received since 2014. The increase in the inflows, is, in large measure, due to the significant changes that have been made in the FDI policy over the years. When the defence sector was opened for private sector investment in 2001, the percentage of FDI permitted was up to 26 per cent, subject to licensing requirements. The policy was again reviewed in 2015, allowing for 49 per cent investment through the automatic route and more than 49 per cent through the Government route. In September 2020, the policy was again changed to allow for 74 per cent FDI through the automatic route.

These changes have been made in order to access modern technology and incentivize the foreign original equipment manufacturers (OEMs) to establish manufacturing units with Indian counterparts. While about 45 FDI joint ventures have been approved, no joint venture with more than 74 per cent FDI has been received in the defence sector so far. This does point to the continuing reluctance of the foreign OEMs to part with cutting edge technology while setting up manufacturing units in India.

The Government’s strategic partnership (SP) model of procurement seeks to qualitatively change the nature of engagement with foreign OEMs. The SP model, first promulgated as part of the DPP 2016, is an effort to energize the domestic defence industrial ecosystem. The model seeks to encourage domestic industry to enter into tie-ups with foreign OEMs to set up manufacturing and infrastructure supply chains with transfer of technology (ToT). The Defence Acquisition Council (DAC) approved the issue of Request For Proposal (RFP) for construction of six conventional submarines in June 2021, the first such project to be pursued under this model.

To foster innovation and technology development in the defence and aerospace sector, the iDEX—Innovation for Defence Excellence – was launched in April 2018. Four Defence India Start-Up Challenges (DISC) have been held so far, in which over 1,000 Start-Ups have participated. Budgetary support of Rs 500 crores have been earmarked for iDEX till 2025-26, for Start-Ups, MSMEs and individual investors, through the Defence Innovation Organization (DIO), an umbrella organization formed with financial contributions from the aeronautics major, Hindustan Aeronautics Limited (HAL) and Bharat Electronics Limited (BEL).
In the 2021–22 defence budget, Rs 1,000 crores have been exclusively earmarked for procurement from Start-Ups. The 2022-23 budget meanwhile, set aside an allocation of 25 per cent of the R&D budget for the academia, Start-Ups and private industry. Over eighty Start-Ups are developing more than thirty cutting-edge products. The Government aims to double the number of products developed by Start-Ups to at least sixty by 2024. In order to involve the stakeholders more actively in developing cutting-edge products most suited to the requirements of the armed forces, iDEX4Fauji was also launched in September 2020.

Seven new defence companies, created from the erstwhile Ordnance Factory Board (OFB), were dedicated to the nation in October 2021. These include Munitions India Limited (MIL); Armoured Vehicles Nigam Limited (AVANI); Advanced Weapons and Equipment India Limited (AWE India); Troop Comforts Limited (TCL) (Troop Comfort Items); Yantra India Limited (YIL); India Optel Limited (IOL) and Gliders India Limited (GIL). This policy measure was taken to improve the functional autonomy and efficiency of the OFB production units. The order book of the new entities stands at over Rs 60,000 crores.

**Challenges**

*Research and Development*

The domestic defence industry will have to step up to achieve the desired objectives and aims of a self-reliant defence eco-system. A key aspect which needs improvement is the research and development (R&D) effort that will produce cutting-edge and quality equipment. The Government has placed a premium on innovation-led economic growth. The Office of the Principal Scientific Advisor’s draft *Science, Technology and Innovation Policy 2020* document lays out an ambitious agenda to create and nurture a cutting-edge innovation eco-system in the country. The document calls for the promotion of technological self-reliance and indigenization, fostering science and technology-led entrepreneurship, increase in R&D spending, and the creation of a national repository for science, technology and innovation (STI), among other significant measures.\(^5\)

The Global Innovation Index 2021 places India at the 46\(^{th}\) position – the second time it broke into the top 50 rankings, after attaining the 48\(^{th}\) position in 2020. In 2019, India was placed at the 62\(^{nd}\) position. India was the most innovative

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country in Central and South Asia, followed by Iran and Kazakhstan. India, along with China, the United States, the United Kingdom and Germany, is among the top five countries in terms of the quantity of scientific output. India’s information, communication and technology (ICT) exports make up nearly 12 per cent of its total trade, while high-tech exports are at 4 per cent of its total trade.

India though spends just 0.7 per cent of its GDP on R&D, and holds the 52nd rank globally, in terms of the percentage spending on R&D. Analysts specifically highlight the fact that private sector investment in the R&D sector is particularly limited in India, while all over the world, the private sector plays a significant role in fostering innovation. The decision to earmark at least 25 per cent of the defence R&D budget to the private sector, Start-ups and academia in the 2022-23 defence budget, is a step in the right direction. The private sector, on its own, will also have to spend a significant portion of their balance sheets on R&D, going forward. Developing cutting-edge products that will not only find favour with the Indian armed forces but also open up export markets, is an added advantage for the industry.

It is heartening to note that Start-Ups are indeed developing cutting-edge equipment – like swarm drones, efficient imaging, infra-red (IIR) seekers for man-portable anti-tank guided missiles (ATGMs), among others, which will, no doubt, find increasing favour with the MoD to address the varied requirements of the Indian armed forces. Steps like Make I projects, sanctioned by the MoD in March 2022, is indeed a reflection of the confidence of the stakeholders in the growing capabilities of Indian industry. As of February 2022, 69 Make projects (four under government-funded Make I and 65 under industry-funded Make II) have been accorded ‘Approval In Principle’ (AIP) by the MoD.

The DRDO, on its part, is actively transferring technologies to Indian industry. During 2021 for instance, 182 Licensing Agreement for ToT (LAToT) were signed with Indian industry. Even so, the DRDO currently lists as many as 200 additional technologies and equipment know-how that is readily available to be transferred to the industry – including in the arena of dual-use technologies. As part of the DRDO’s Technology Development Fund (TDF), over Rs 190 crores have been transferred to the MSMEs, for nearly 40 products. Of these, only one product has so far been accepted by the Indian Air Force. The RakshaRajyaMantri told the Rajya Sabha in December 2021 that many

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other technologies being developed with funding by the TDF are in an advanced stage of acceptance by the armed forces.

The DRDO’s Development-Cum-Production Partnership (DcPP), Development Partners (DP), or the Production Agency (PA) programmes have been a key initiative which involve both the private and public sectors in the development of prototypes and their eventual manufacture, to meet the requirements of the armed forces. To take a recent example, in December 2021, Hindustan Aeronautics Limited (HAL) secured an order for the manufacture and testing of a High-Speed Expendable Aerial Target (HEAT), designed by the DRDO laboratory, Aeronautical Development Establishment (ADE). After the trials, HAL will be an equal DcPP, along with a private firm, to meet the requirements of the tri-services for this particular piece of equipment, used extensively for evaluation trials of missile programmes.

The Special Purpose Vehicle (SPV) model announced in the Defence Budget of 2022-23, will be the vehicle to utilize 25 per cent of R&D funds. The SPV model is a crucial step to more organically involve the private sector in the research and development of military equipment. The SPV is a natural extension of the DcPP programme, in that, while in the former, the industry is the development-cum-production partner, in the SPV model, the industry will also partake in the design of the equipment. While various ownership models and frameworks are being touted to take this important R&D initiative forward, the challenge will be to ensure that the SPV works smoothly to fulfill its essential mandate of involving the industry more fully in the entire process of design, development and production.

Assurances to Industry

Given the fact that the only buyer for the products that will be made by the domestic defence industry (both the private as well as public sector units) is the Indian military – that is, the market is a monopsony – the defence industry faces unique challenges. While the buyer, i.e., the Indian military, will need assurances relating to product quality and supply, the private industry, specifically, will need a clear roadmap in terms of an order book. The new public sector defence companies, created out of the erstwhile DPSUs, currently have orders worth Rs 60,000 crores. Private industry associations, have also urged for the creation of an additional manufacturing unit in the private sector, even if the new defencea DPSU manufactures a particular item/equipment.

Assurance of volumes for the private sector, especially for products that are not being manufactured by the DPSU currently and which are required for
the armed forces, is essential. This will help the industry make informed business decisions, given the huge costs involved – not just in terms of research and development aspects (referred to as ‘sunk costs’) but also due to the long gestation periods involved in developing defence products. The MoD has stated that efforts will be made to procure at least 15 per cent of the total capital procurement from the private sector in 2021-22. The private sector, therefore, will have anticipated orders worth over Rs 10,000 crores, out of the MoD’s domestic capital acquisition budget of over Rs 71,000 crores, in 2021-22.

In this context, the two positive indigenization lists promulgated, are indeed, a step in the right direction. Another indigenization list, made up of sub-assemblies and components, was also notified in December 2021. These lists have to be further gradually scaled up in terms of technological complexity so that, going forward, cutting-edge and niche equipment and platforms can be exclusively sourced from domestic industry. Supplying such equipment to the Indian armed forces will also position domestic defence firms to have a far greater leeway in pursuing and capturing export markets.

User-Developer Integration

The MoD has taken steps in the recent past for the user, i.e., the Indian military, to not only have a greater say in the development of defence products but also to be involved more directly in the process. The iDEX4 Fauji, launched in September 2020, is one such step, as part of which, serving military officers are incentivized to develop cutting-edge products. This is in tune with the best practice, as seen in countries like Israel, where the forces play an integral part in developing equipment and platforms in the light of their practical battlefield experiences. Going forward, there has to be a greater enmeshing of the user in developing products and equipment, even perhaps with the private sector.

In Summary

The aim of the policy measures taken by the MoD, key aspects of some of which have been highlighted above, is to transform the domestic defence industry from being an ‘importer’ to an ‘exporter’ of defence systems and to assist in the transformation of the Indian military from being a ‘buyer’ to that of becoming a ‘builder’. Significant contracts like that of the Light Combat Aircraft (LCA) Tejas Mark IA, have been signed with Hindustan Aeronautics

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Limited (HAL) in January 2021. Such mega contracts are, no doubt, a boon for the domestic industry, especially for the numerous medium, small and micro enterprises (MSME’s), which will inevitably be a part of the supply chain. The sum total of such initiatives will add volumes to domestic defence industry, as well as provide significant economic benefits including employment, among others. Going forward, the challenge for domestic defence industry is to enhance its technological value proposition, by adopting and creating technologically-driven solutions and equipment, for the domestic as well as the global markets.