Indian defence sector

The '101 list'

- a bold step which has long term potential

Part-I of analysis of the negative list

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An action with a vision

The Ministry of Defence (MoD) on 09th August 2020 released a **negative list of 101 items for import embargoes phased over a period of time – mainly between 2020 and 2024**. The negative list was announced in light of the COVID impact on the domestic businesses, as part of the stimulus measures announced during the Atmanirbhar Bharat Abhiyaan a few months back. The Make in India initiative in defence picked up pace around 5-6 years ago as steps were taken to align the champion sectors (defence being one of them) with the broader objective of indigenization and self-reliance. However, this negative list of items acts as a significant chapter because it specifies the items/products which India will not import after the corresponding specified year.

The list has reportedly been compiled after considerable thought and discussions with all relevant stakeholders. Hence with the list now in the public domain, it is unlikely that there would be any second thoughts on its contents. While emergency powers to purchase products and equipment are arguably out of the ambit of this list, the list is expected to be applicable for the normal processes. **A clarification that is required is on the mandated IC levels for products in this particular list.** While the embargo lies on the products/items, its constituents could still be imported especially where their availability in India is not yet ascertained / where the requirements are not being met. Hence, with the ultimate aim of indigenization and self-reliance, this is a great opportunity for the domestic industry to not only ensure that the end product is made in the country but that the supply chain is also localized.

There are only a few equipment which have 100% indigenous content. This first list includes complex systems which are at various stages of development. This will require a lot of investment in R&D, industry, particularly SME, and academia. Besides, an efficient independent and neutral mechanism for monitoring indigenous content must be put in place to achieve the policy intent.

Given the types of equipment systems and the timeline for implementation of the 'no import' list, the procurement procedure will have to be modified to ease single source procurements for many of the items.

It is important that this 'no import ban' is followed up by a progressive reduction of the import component if we wish to achieve any worthwhile degree of self-reliance.

The L1T1 concept with 'Price Indexing of Technology' must be undertaken expeditiously.

For an entity to qualify as an Indian vendor, additional conditions of "ownership and control by resident Indian citizen(s)" were introduced under draft Defence Procurement Procedure (DPP) 2020. Subsequently, the FDI limit for the defence sector under the automatic route was proposed to be hiked from 49% to 74%.

The draft DAP 2020 has done away with the additional conditions of ownership and control. It now permits companies complying with the FDI regime to qualify as an Indian vendor, thereby permitting companies which are compliant with extant FDI (i.e. proposed to be 74%) to be eligible as Indian vendor.

As such, **it would imply that a foreign company with 74% holding while collaborating with a minor holding Indian entity, will be eligible to provide products in the Negative List of Imports**. If the aim of the negative list of import items is largely to restrict the production of the items to domestic industry, the 74% holding with eligibility as Indian vendors would allow a majority foreign holding company with full control of technology also to be included within the purview. It, however, would allow an avenue for niche technology products to be made in India, but not to the full consonance of Government objectives and industry enablement. The Indian government entities including the DPSUs and the Ordnance Factories (OFs) have a confirmed order book for anywhere between 2-4 years for most of them.

While plans are under discussion to corporatize OFs so that there is more efficiency in operations, the order backlogs for DPSUs are not really expected to reduce in the near future. More so **with DPSUs and OFs expected to become system integrators, going forward it is essential to have more of the private industry into the mix** so that the demand is optimally met from within the country. In that context, the negative list provides the opportunity for all stakeholders to ensure that an ecosystem is created wherein the indigenous supply chain supports the end product being assembled within the country.

The critical issue when importing products/equipment is in being overly dependent on them without a system in place to keep finding alternate indigenous solutions. The list of the 101 items are spread across all segments from aerospace to land to naval systems. In this paper, we have endeavored to segment the list at a slightly more tiered level rather than just from a Services perspective.

The list

Segment	Effective December 2020	Effective December 2021	Effective December 2022 onwards
Arms	• 7.62x51 Sniper rifle • Dragunov upgrade system • PKMG upgrade system	• Light Machine guns • Assault rifles 7.62x39mm	-
Ammunition	• 120mm FSAPDS Mark II ammunition • General purpose pre fragmentation bombs between 250-500 kgs • All variants of depth charges • Anti-submarine rockets • Chaff rockets	• 125mm FSAPDS new generation ammunition • 30mm ammunition for infantry fighting systems • Mine fragmentation • Mine anti-tank • Mine anti-personnel blast • Multi-purpose grenade	• 40mm UBGL • 155mm artillery ammunition • 30mm HEI / HET • 23mm ZU ammunitions • 30mm VOG17 • Electronic fuses for artillery ammunitions • BMCS • GRAD BM Rocket
Missiles / Torpedoes / Weapon systems	• SRSAMs (Land variant) • Ship borne cruise missiles • MBRL (Pinaka variant) • Shipborne close in weapon systems • Anti-submarine rocket launchers • Shipborne medium range guns • Torpedo tube launchers for light weight torpedoes • Chaff rocket launchers	-	• Light weight rocket launcher • Astra Mk-I BFRAAM • Close in Weapon system (land based) • Long range – land attack cruise missile
Artillery systems	• Tracked SP Gun (155x52 cal) • Towed Artillery Gun (155mmx52 cal) • 155mm / 39 cal ULHs • Next generation maritime mobile coastal battery (long range)	-	-
Simulators	• Simulators presenting smart ranges and multi-function targets • Battalion support weapons simulators • Container based simulators for live fire training • Tailor based simulators for counter insurgency / counter terrorism based training • Force on force live tactical simulators / infantry weapon • Tank simulators (driving as well as crew gunnery) • Simulators for A vehicles / B vehicles • Simulators for towed and self-propelled guns of air defence • Simulators for correction of fire by observers	-	-

Segments considered in this paper for analysis

Segment	Effective December 2020	Effective December 2021	Effective December 2022 onwards
Electronics	• Successor of Flycatcher & upgraded USFM / Air Defence Fire Control Radar • Ship borne sonar system for large ships • Hull mounted submarine sonar • Integrated Ship's bridge system • Radar warning receiver for transport aircraft • Ground based Mobile ELINT System • Digital tropo scatter / LOS communication system • Low level transportable radar • High power Radar (HPR) • Software defined radio for IN	• Inertial navigation system for ship applications	• EW systems • EW Suite for Mi-17 V5 helicopters • Light low level terrain radar
Personnel gear	• Bullet proof jackets • Ballistic helmets	-	-
Naval platforms / vessels and allied items	• Missile Destroyers • MPVs • OPVs • Next Gen missile vessels • Anti-submarine warfare shallow water crafts • Water jet fast attack craft • Ammunition barges • 50 ton bollard pull tugs • Survey vessels • Floating Dock • Diving support vessels • Pollution control vessels • Magneto - Rheological Anti Vibration Mounts • 500 ton self-propelled water barges	• Conventional submarines	-
Land Platforms Vectors	• Military trucks of 4x4 and above variants: 12x12, 10x10, 8x8, 6x6 • Field Artillery Tractor 6x6 for medium guns • Component level repair facility for T-90 tanks	• Wheeled AFVs	• Material handling crane 2.5 to 7.5 tons (vehicle mounted)
Aerial platforms and allied	• Short range maritime reconnaissance aircraft • LCA Mk-1A enhanced IC • LCH • Transport aircraft (light) • Aerial delivery systems for transport aircraft • Fixed wing mini UAVs	-	• Basic Trainer aircraft • Expendable aerial targets • Small jet engines with 120kgf thrust
Space and allied	• GSAT-6 satellite terminals	-	• Communication satellite GSAT-7C • Satellite GSAT 7R
Miscellaneous	• CBRN Detection and Monitoring system • CBRN decontamination and protection system • Parachute tactical assault (PTA) – G2 • Advance landing ground communication terminals for AGLs	-	-

Segments considered in this paper for analysis

A high level overview

In this section of our research, we have highlighted segments most relevant for the Indian Army from this list of 101 items. We have omitted ammunition here as it is a separate discussion owing to it being a more recurring requirement and arguably deserving an individual space!

Small arms

The overall inventory requirement of small arms for the Indian forces are estimated to be around 5-6 million split between defence, paramilitary and police forces. There is an evident capability gap primarily due to the vintage designs coupled with varied types of existing inventory like that from the US (M4A1 Carbine), Israel (Galil 7.62), Russia (AK-47s), South Africa (Denel NTW-20), Hungary (Gepard GM6 Lynx) etc. The total requirement of small arms in the coming decade or so is expected to be around 2 million units covering small arms and light weapons like revolvers, pistols, rifles, carbines, machine guns, assault rifles, grenade launchers etc. In the last few years, attempts have been made to plug the immediate requirements and also to focus on indigenous production of the balance.

In 2018, 72,400 assault rifles of SIG SAUER were ordered, and another 72,400 units' order is under discussion. Close to 93,985 carbines (CQB) are in the process of being ordered from UAE's Caracal International under the FTP category. It is important to note that demand for such carbines is estimated at around 3.5 lakh units.

A contract to procure 16,479 light machine guns (against an RFI for 40,949 LMGs issued in 2018) was signed with IWI, Israel for their Negev 7.62x51mm LMG. IWI had a JV with Punj Lloyd whereby their Gwalior facility was expected to manufacture machine guns, carbines and other weapons – the Adani Group reportedly bought the Gwalior unit early this year.

While the above are planned imports, **Indo Russian Rifles Pvt Ltd (a JV of Ordnance Factory Korwa with a Russian company) was expected to start production this year** whereby close to ~7.5 lakh 7.62x39mm AK-203s were to be manufactured. The plan was to gradually increase indigenization so that after the first 1.2 lakh rifles, the product becomes 100% indigenous.

The DRDO has also been involved in the development of the 5.56 INSAS family of rifles along with the 7.62mm Self Loading Rifle (SLR) which are in use by the forces. DRDO is also involved in the development of the Joint Venture Protective Carbine (JVPC) which is being produced by OFB and few private companies. The OF in Trichy, Small Arms Factory in Kanpur and Rifle Factory in Ishapore are also involved in the manufacture of small arms. The Rifle Factory in Ishapore, for example, was earlier involved in the manufacture of .303 British calibre Short Magazine Lee–Enfield Mk III, 7.62×51mm NATO calibre Ishapore 2A1 rifle, and the 7.62mm NATO L1A1 Self-Loading Rifle; and now the product range also includes 5.56mm INSAS rifle assault rifle for the Indian Army, Kalantak rifle, Ghatak rifle (7.62×39mm AKM-style assault rifle) and other weapons like Pistol Auto 9mm 1A, .22 revolver and .315, .30-06, .22 sporting rifles both for military and civilian markets.

There are a few private companies also in the small arms space. Companies like the SSS Defence's product portfolio ranges from infantry small arms and light weapons to small and medium caliber ammunition. The company is also reportedly completing the design and development of the 7.62x39mm rifle, which is part of the negative list.

The Kalyani Group also reportedly has an MoU with Bulgaria's Arsenal to manufacture the 'AR' 7.62x39mm assault rifle and the 'MG' 7.62x51mm machine gun series.

Jindal Defence has a JV with Brazil's Taurus Armas and is expected to manufacture carbines, assault rifles, pistols and revolvers in India based on ToT from Taurus. MKU has a venture with Thales to manufacture the F90 CQBs at its Kanpur facility. The Union Home Ministry has reportedly held discussions with 17 private Indian companies including L&T, Godrej, Kalyani Group and VEM Technologies for manufacturing of small arms for CAPFs.

It is sufficient to highlight that many private companies in India are involved in or have invested for the development of small arms segment with or without ToTs from foreign companies. Sufficient capacity and capability are being built that can now be fast-tracked to be able to meet the mandate of the negative list by December 2021. **While the DRDO and OFB are working on the R&D and production of small arms, it is important that private companies also get the opportunity to prove the quality of their products.** A collaborative effort will go a long way in ensuring that imports in small arms are minimal going forward.

Artillery systems

Until a few years back, artillery systems was one of the major equipment in the requirement list for the Army. The fact that after 1986 there were no new artillery systems procured is reflective of the gap that was present in the ecosystem. In the last few years, however, there has been a lot of development on this front.

As part of the larger INR 50,000cr Field Artillery Rationalization Plan (FARP) approved in 1999, a target of around 3000 guns was set to be achieved by 2027 including 814 mounted guns, 1580 towed guns, 100 tracked self-propelled guns, 180 wheeled self-propelled guns and 145 ultra-light howitzers. In the last few years:

- The contract for 145 M777s was signed with BAE Systems in 2016 out of which 120 ULH were to be assembled, integrated and tested in India by Mahindra Defence Systems Ltd from its facility in Faridabad, Haryana. BAE reportedly has identified around 40 Indian suppliers to join the supply chain of the M777s.

- The K-9 Vajra tracked self-propelled howitzer order was signed in 2017 with L&T being the Indian partner in the contract. The first 51 guns were delivered by January this year, and the remaining 49 are expected to be delivered by end of 2020 – all reportedly ahead of schedule.
- The OFB received orders for 114 units of 155mm 45 cal Dhanush towed guns (having achieved 81% IC levels) out of which 6 have been delivered till date. Apart from that OFB's Gun Carriage Factory in Jabalpur in 2018 had received an order to upgrade 300 of the 130mm M46 towed guns to 155mm 45 cal standard guns, rechristened as Sharang guns.
- The ATAGS is another program for the towed guns segment, prototypes of which are being developed by both Bharat Forge and Tata Power SED. While the overall order is expected to be for around 2000 such guns, the initial order is expected to be for 150 units with the L1 being given an order for 107 units and L2 given the balance order.

Clearly, there has been a lot of activity in the artillery systems segment and **with entities like OFB, Mahindra, L&T, Bharat Forge and the Tata Group involved, significant investment has gone into this segment**. More importantly with military materials being given importance in draft DAP 2020 companies including Bharat Forge, who also have casting and forging abilities at their core, have a lot of opportunities in land platforms like artillery systems, to continue increasing their indigenous content.

Simulators

The list of 101 items has identified 9 simulator systems:

Simulators presenting smart ranges and multi-function targets	Tank simulators (driving as well as crew gunnery)
Battalion support weapons simulators	Simulators for A vehicles / B vehicles
Container based simulators for live fire training	Simulators for towed and self-propelled guns of air defence
Tailor based simulators for counter insurgency / counter terrorism-based training	Simulators for correction of fire by observers
Force on force live tactical simulators / infantry weapon	

Simulators are possibly the most cost and time-effective method of training in the usage of the system and its maintenance. While almost half of the simulators in the Indian ecosystem are flight/air-based, land-based training and simulation systems account for almost half of the remaining market share (~25% of the whole market). **While there have been instances of driver and gunnery simulator systems being inducted into the Indian Army, there is scope for a lot more**. The current defence simulation and training market in India has few established players including the DRDO, Zen Technologies, Alpha Design Technologies and CAE India, among others.

While there are a lot of product portfolios in flight simulators, there are a few in land systems simulators as well. CAE India, for example, reportedly has among others, a BMP-II Integrated missile simulator, a driver simulator and a gunnery training simulator for the Arjun MBT in its range of product offerings. Zen Technologies, for example, has among others, a driving and a crew gunnery simulator for the T-72 and T-90 tanks, a driving simulator for the ICV, infantry weapons training simulators, medium machine gun simulators and artillery forward observers simulators.

Zen Technologies also exports simulators, especially its 4 and 6 lane systems to facilitate marksmanship training in several countries.

No doubt a key requirement for the forces, simulators in the negative list is an important inclusion and should ideally lead to cost savings and development of more such capabilities indigenously.

Land platform vectors

The Indian Armed Forces have historically sourced most of their land platforms like the T-72 and T-90 tanks from Russia. More than 4,000 tanks power the country's armoured regiments with a sizable mix including T-72 and T-90 / T-90S tanks along with Arjun MBTs. Complementing the T-72/90 tanks in armoured and mechanized infantry formations are BMP-2 mechanized infantry combat vehicles. India has further signed a $3.12bn contract for local production of 464 T-90S tanks whereby UralVagonZavod and Rosoboronexport will be paid $1.2bn for ToT and OFB would be paid $1.92bn for local production of the tanks. While attempts have been made to indigenize content on the tanks, still the engines and transmission systems that make up 45% of the cost of a T-90S tank, for example, are imported.

The negative list highlights an embargo on component level repair facility for T-90 tanks. **In February 2020, 14 MoUs were signed between Indian and Russian companies for setting up JVs covering a range of equipment that included T-90 tanks**. The need for indigenous availability of spares has further come to the fore in recent times where the Indian Army sought support for an urgent and emergency supply of spares for their MBTs among others. **Spares and components coupled with repairs are a frequent requirement for equipment, and hence an indigenous supply chain is the only long-term solution that should be sought**. The current embargo is in the correct direction.

With indigenous engines (V-46-6 and V92S2) also being attempted, it is hoped that in the forthcoming additions to this list of 101 items, engines will also soon be able to figure.

Personnel gear

There is an imminent demand for bulletproof jackets for the Indian Armed Forces out of which SMPP Ltd won an order for 1.86 lakh BPJs in 2018 and the tendering process for further supply is reportedly in progress. DRDO handed over its technology to manufacture bulletproof jackets to MKU Ltd. OFB reportedly received requests for around 200,000 'Bhabha Kavach' BPJs in 2019 including around 50,000 each for the CRPF and BSF, 25,000 for the ITBP, 25,000 for the CISF. The Tata Group via TASL, manufactures lightweight bulletproof jackets and has also supplied the same to the elite counter-terrorism wing OCTOPUS and an anti-Maoists unit called Greyhounds. Ballistic helmets is another part of the personnel gear, and an overall requirement is estimated to be for over a million helmets. An order for 1.6 lakh helmets was given to MKU in 2018, and a recent RFI in June 2020 was to procure 100,000 ballistic helmets – the RFP for the same is expected sometime in February 2021.

In both the jackets and the helmets, the most critical component is that of the material with which it is made - light but strong, effective and durable.

In both the jackets and the helmets, the most critical component is that of the material with which it is made. The material needs to be light but strong, effective and durable. In most of the cases, the material is carbon fiber and/or Kevlar, and that is where the importance given to military materials in draft DAP 2020 should be able to get more companies into this business and eventually the supply chain.

Even from an export perspective, companies like MKU, SM Carapace Armor and Indian Armor Systems Pvt Ltd have reportedly exported BPJs and helmets to foreign countries.

Key areas to look into

With **the technological advancements** in all sectors, it is crucial to keep pace with the same. That is probably where an element of challenge is in the current establishments. In small arms for example, the INSAS rifles lines established in OF Tiruchirappalli, Small Arms Factory Kanpur and Rifle Factory Ishapore are a significant investment but since they are insufficient to meet the requirements, **it is important to also provide the opportunity to the private sector**. With private sector in some cases already having invested time and money, it is essential that it be considered. **It is also important that private industry be given an assurance of regular orders** (with regular quality checks, of course) so that it has an incentive to further conduct R&D and make capacity and capability related investments.

There is no lack of intent in participating in the ecosystem in any of the above areas from both the public and private industries. A more confirmed order book coupled with incentives would go a long way to give confidence especially to the private companies to invest in R&D for these segments. The DRDO also released a list of 108 military sub-systems and components that have been identified for design and development only by the Indian industry, with support from DRDO. **Both these evolving negative lists will give significant opportunities to the private entities to develop capabilities, collaborate with established companies and be a part of the ecosystem.**

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