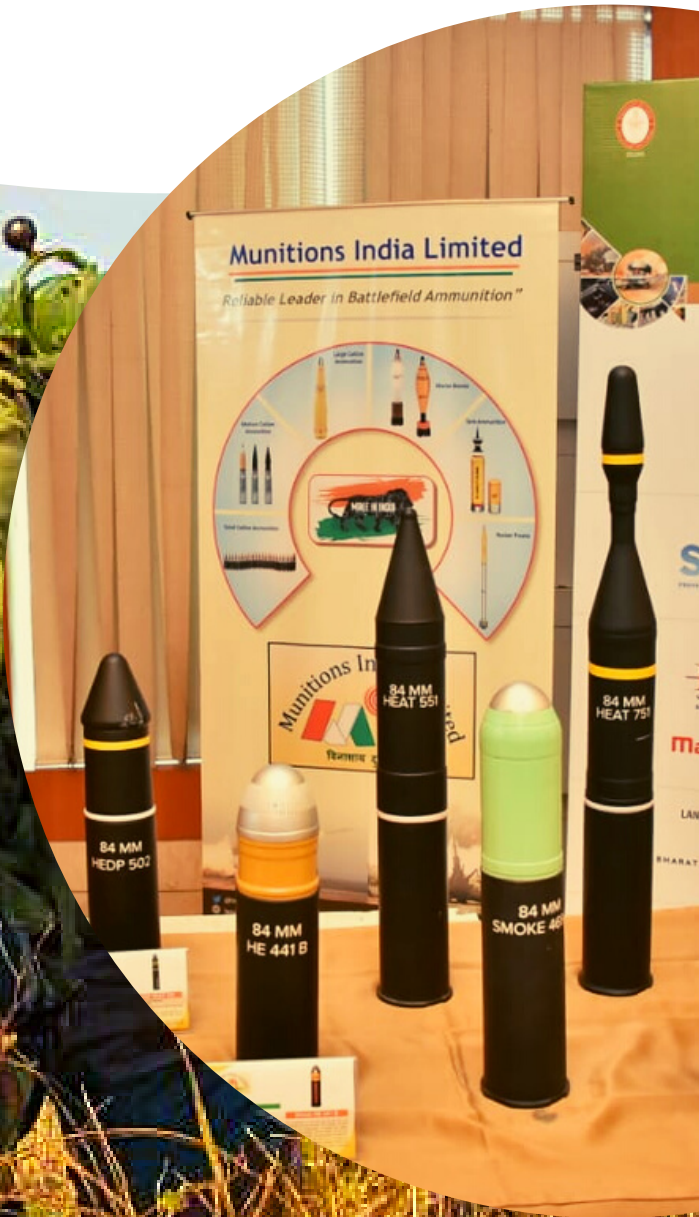
CENJOWS

AMMO INDIA 2022

REPORT



CENTRE FOR JOINT WARFARE STUDIES (CENJOWS)

SEMINAR REPORT ON 2ND CONFERENCE ON MILITARY AMMUNITION "AMMO INDIA 2022" HELD ON 27 – 28 JUL 2022

INTRODUCTION

The transformation of indigenous manufacture of ammunition began in 2016, when in a landmark move, the MHA revised the Arms Rules 1962 (now called as the Arms Rules 2016) to allow Indian companies to manufacture and proof test of firearms. Subsequently, in 2017 these were amended again to boost the 'Make in India' initiative. An unprecedented procurement initiative was launched by the MoD in 2017 when eight RFPs were issued for procurement of medium and large calibre ammunition from the Indian private industry. Four more RFPs were issued later. Another historical and transformative turn took place in Oct 2021, when OFB, which used to meet over 80% of munitions requirements of the Indian Armed Forces, was dissolved and MIL and YIL were formed as new corporate entities. Meanwhile, further reforms increased automatic FDI for munitions to 74% and several Make 1 and 2 projects were initiated. The Second Edition of AMMO India was held in the backdrop of these transformative changes. The global ammunition market, valued at USD 22.35 billion in 2021, is expected to expand at a CAGR of 3.2% from 2022 to 2030, swelling to a market size of US $30 billion by 2030. The conflict in Ukraine is dragging on and an early end does not appear to be in sight. The criticality of ammunition stocks and supply chains has been underscored by artillery shells in excess of 20000 reportedly being fired by Russia every day, while supplies of smart and intelligent munitions are running short, in the ongoing conflict.

India has, and will continue to face challenges along its northern and western borders, in the foreseeable future. Both China and Pakistan present a persistent threat and multiple escalations have been witnessed in the recent past, laden with the possibility of a two-front war. Ammunition for the Armed Forces needs to be stocked to sustain intense conflicts for durations which would vary based on scenarios and regional security dynamics. CAG reports which were made public till 2017 had flagged persistent shortages in a variety of ammunition stocks. While emergency procurements in the recent past could have addressed certain critical voids, it is axiomatic that the indigenous capacity of DPSUs, MIL & YIL need to be augmented by the private industry. Besides capacity, we need to bolster Atmanirbharta in munitions by harnessing technology, R&D, design, development and production by the private industry, to shed import dependence.

The event aimed to provide a common platform to the users, private industry, DPSUs, DRDO and policymakers to discuss shared concerns and jointly evolve measures/mechanisms to mitigate and overcome the challenges. The event witnessed a very enthusiastic response from all stakeholders- Government, Users, DRDO, Academia, foreign OEMs and Private Industry alike.

Privatization and indigenisation of munitions will bolster ***"Atmanirbharta",*** *besides generating a policy option of* ***reducing the holding of ammunition reserves,*** *given an indigenous surge capacity.*

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CONDUCT

Sessions	Agenda
Session 1	Ammunition for Tank and AFVs and Anti Tank Munitions
Session 2	Artillery Ammunition including Fuzes
Session 3	Air Defence, Aerial Munitions: Missiles and Bombs
Session 4	Munitions for Unmanned Platforms
Session 5	Naval Munitions
Session 6	Ammunitions for Small Arms; Explosives and Mines

REPORT LAYOUT

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POLICY INSIGHT AND VISION OF RAKSHA MANTRI

The Hon'ble Raksha Mantri, Shri Rajnath Singh observed that seven DPSUs have been formed out of OFB, and out of these six have reported profits within six months, with MIL bagging export orders of Rs 500 Cr, an indication of Indian manufacturing possibilities in Munitions. Key takeaways from the address are as follows:

A. <u>Indigenisation of Advanced Ammunition with Innovation</u>

The RM stressed on requirement of *indigenous advanced ammunition* and the need for the creation of an innovative and self-reliant defence ecosystem that ensures that the Armed Forces are fully prepared to meet the current and future security challenges. Citing the experience of exploiting precision munitions in the Kargil War (1999) and Balakot Strikes (2019), the need for the development of smart and precision munitions was emphasised. For India to become a leading power in defence production, indigenous design, development and production of ammunition is an inescapable necessity.

C. <u>Startups and MSMEs</u>

He highlighted the initiatives of the Ministry of Defence, including earmarking of 68 per cent of the capital acquisition budget for the domestic industry in 2022-23 and allocating 25 *per cent of the domestic capital procurement budget for promotion of private industry, MSMEs and start-ups. He also shed light on the policy which allows DRDO-Industry Special Purpose Vehicle to develop essential advanced defence products.* Underscoring the role of MSMEs and start-ups, he highlighted that the scope of Defence Innovation Start-Up Challenges and Technology Development Fund has been expanded to create more opportunities for them.

B. <u>Policy Shifts to Enhance the Role of Private Industry & MSMEs</u>

The important role of the private sector in strengthening the defence ecosystem in the field of munitions was emphasised. He highlighted that many *barriers, like capping of number of bids, criteria for financial eligibility and credit rating have been removed by the Government through considerable relaxations.* He added that the Government will continue to examine viable suggestions and recommendations to transition from self-sufficiency to self-reliance.

D. <u>Collaboration with Global Industries</u>

He explained that 'Atmanirbharta' implies a healthy mix of local endeavours and foreign collaboration to achieve self-reliance in ammunition manufacturing. He said that the Ministry is encouraging *foreign OEMs to invest, manufacture and export from India, in line with 'Make in India, Make for the World' vision of Prime Minister Shri Narendra Modi.* India has the advantage of educated manpower, lower development costs and consumption capacity.

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POLICY INSIGHT AND VISION OF RAKSHA MANTRI

E. Atmanirbharta in Munitions

In 2016 the Government kick started "Manufacturing of Ammunition for Indian Army by Indian Industry" and issued RFPs in 2017, which were duly amended based on the market response. Four of the 12 projects have reached the trial stage. The three positive indigenisation lists promulgated in the recent past list nearly 50 items of ammunition, including Guided Extended Range Pinaka Rockets, Advanced Light Weight Torpedos, Anti-Radiation Missiles and Loitering Munitions. This reflects the confidence of the Government in R&D and manufacturing prowess of the domestic defence industry. He exhorted the public & private sectors, R&D establishments, start-ups, academia and individual innovators to explore and exploit these opportunities to create a base that caters to the needs of the Armed Forces.

F. Export Potential

He observed that MIL has already received export orders worth Rs 500 crores, terming the achievement as an indicator of the huge opportunity for the domestic ammunition industry.

KEY TAKEAWAYS

- **Users- The Three Services and CAPFs**

The salience of munitions in capability enhancement was underscored by endorsing the fact that range and lethality enhancement through munitions is more pragmatic, cost-effective and timely than developing new weapon platforms altogether. **There is a perceptible paradigm shift from a platform-centric approach to a munition-centric approach.**

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KEY TAKEAWAYS

- **Three Services and CAPFs**

Policy	The response of the Industry to eight Make 2 Cases drew deep appreciation. (i) The User confidence in private industries and MIL/DPSUs is high, as substantiated by the fact that ***all 11 tenders issued for munitions between March 2021 and May 2022, are under the Category of Make in India,*** spanning a 10-year requirement.
	(ii) **RFPs.** A flexible and pragmatic approach has already been demonstrated through **interactive RFPs.**
	(iii) **MHA was Earlier Procuring SA Ammunition from OFB.** With creation of MIL, a corporate entity, procurement, QA/QC and testing policies and procedures need an early review and resolution.

Ammunition/ R&D	(i) The users highlighted the *urgent requirement of more advanced, smart, precision-guided, loitering and intelligent munitions*, for land, naval and aerial weapons alike.
	(ii) The need for BLOS and loiter munitions, leveraging AI and MUMT was *underscored by all users.*
	(iii) The Users placed a *premium on four desirables- Quality, Cost, Timely Delivery and Surge capacity.*
	(iv) The need for early indigenisation of electronic fuzes, including immune GPS and ECM/ECCM, especially for the Air Force was underscored.

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KEY TAKEAWAYS

- **Three Services and CAPFs**

Ammunition/ R&D	(v) Advanced munitions requirements are centered on autonomous/ Man-in-loop munitions, modular & dual band, jam resistant sensors & guidance, Dual CCD, Cooled and uncooled seekers, pulsed motor/ SFDR/ Ramjet propulsion and Penetration-cum-Blast/Blast-Fragmentation warheads. Besides, Range Extension and Precision Guidance Kits are required for existing munitions.
	(vi) Associated challenges of munitions/ missiles integration with platforms and Combat or Battle Management Systems were also highlighted. Munition design should facilitate integration and use with multiple platforms (eg aircraft, helicopters, UAVs).
	(vii) Accuracies of near 1-2 meters are needed at extended ranges.
	(viii) Munitions should be usable and stay stable over a wide temperature range of -40 deg to +50 deg Celsius. The ineffectiveness of Thermobaric/blast munitions in HAA could be factored in while framing user requirements.
	(ix) Shedding import dependence for ammunition of Tavor Rifles, AMR, AGL, Dragunov Sniper Rifle, UBGL, MGL should be accorded priority.
	(x) **Material**. The need for *indigenous advanced materials and alloys* to shed import dependence is inescapable.
	(xi) *Varied munitions and payloads are required for* ***unmanned platforms***- Anti-Personnel, Anti-Tank, kamikaze, EW, loitering and Swarms.
	(xii) In the maritime domain, there is a huge opportunity for the industry in indigenisation, Under Water systems, missiles, fuzes, torpedos, mines, guns, counter-drone systems and chaff.

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KEY TAKEAWAYS

- **Three Services and CAPFs**

Infrastructure/ Ranges/ Facilities	The users expressed committed support for making infrastructure, firing ranges and facilities available to the private industry.
QA/ QC	Citing ammunition related accident rates as 1 every 4 days, the Users unanimously *flagged* QA/QC *concerns*, especially as regards propellants, batteries, mines, primers and casings.
Life Extension Presents a Big Opportunity to the Industry	Replenishment and life extension of missile systems, which entail testing, refurbishment, safety, servicing and reliability, could be addressed through long term JVs of over 20-30 years.

- **Industry**

New types of ammunition required by the users have been offered under the Make 2 category to encourage industry R&D and obtain indigenous solutions.

Policy	(i) **<u>Rate Contracts</u>**: The Industry opines that **rate contracts,** with agreed variable rates over time, would be more viable for contracts spanning 10 years, as for munitions.

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KEY TAKEAWAYS

- **Industry**

Policy	(ii) **Make 1 and 2 Categories**. It was argued that Make 1 & 2 are unviable for rockets/ missiles and certain advanced **munitions, considering the time and costs involved in the development of the prototypes**. Unreasonable timeframes for responding to EoI were also highlighted, citing the case of TGMs for 155mm, where **5 prototypes were sought in 30 weeks**, a product with a CEP of 10 meters, GPS, laser designator, ECM/ ECCM features, **all of which need R&D, time and funds. Such requirements inherently favour MIL.** It was also argued that **FOEM may not be willing for ToT for Make 2, since a prototype may not result in an order eventually,** whereas for **Buy Indian category, even 60% IC may be achievable** with a contract in the hands of the Indian Partner.
	(iii) Due to peculiar restrictions on FOEMS, **ToT and IPR for munitions are more challenging** than for other weapons and systems. Moreover, **percentages of Indigenous Content (IC)** stipulated at **50%-60% are unviable at the prototype stage**, and must be lowered. It was also opined that 100% indigenisation is not feasible since the FOEM may not hold IPR for 100% components. Another argument was that in **case the material itself is not available in India,** it should not be included while determining the IC percentage.
	(iv) The Industry felt that though the 12 RFPs were initiated for procurement of munitions from private industry in 2017, the **procedures and outcomes do not inspire much confidence,** since there were several amendments issued, only 4 had reached the trial stage and no order had fructified in 5 years. It was also argued that **3 months timeframe is too short** for responding to RFPs for tank/ artillery munitions.
	(v) It was also argued that **integration kits for aerial munitions** carry a high cost of Rs 14 Cr per aircraft, **rendering Make 2 unviable**. There was also the advocacy of **MoD backing for loans for MSMEs and Startups**
	(vi) Fast-track development and provide higher levels of assurance, a few opined that PPP or SPV models would be more suitable for missiles, rockets and advanced munitions. There was also advocacy for models like DPSU/ MIL plus 1 industry player.

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KEY TAKEAWAYS

- **Industry**

Policy	(vii) Most Industry captains felt confident that FOEMs will exploit the opportunity by partnering with Indian companies, many of which are already exporting items based on competitive advantage in quality and not costs.
	(viii) **Availability of AHSP/ Drawings.** The industry highlighted that while the Open Tender Enquiries (OTE) is undertaken by the OFB however, the drawings are held by DGQA Authority Holding Sealed Particulars (AHSP). While the OTE only gives out the specification of the product, quantities etc however, the drawings provide an insight into the product. The industry recommended that a single window mechanism for the availability of drawings, dovetailed in the OTE, needs to be adopted for greater clarity and time-bound response by the industry.

Ammunition / R&D	(i) Smart and advanced weapons include components like Inertial Measurement Units (IMU), seekers and Servo actuator Motors, **which are still imported.** The Government needs to **provide financial support for design and development.**
	(ii) **DcPP Strategy.** The Industry felt that ToT to the Industry from DRDO is feasible for technologies like Thermobaric munitions. It was also recommended that for kinetic munitions, where explosives do not play a major role, ToT should be to the OEM for the kinetic component, and not the partner for explosives. It was also argued that **DcPP route could result in different types/ models of the same item,** creating larger inventories.
	(iii) MBDA and L&T partnership was highlighted as a good model for marine munitions.

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KEY TAKEAWAYS

- **Industry**

Infrastructure	Since the shelf life of munitions exceed 10 years, a manufacturer may secure only one to two orders, resulting in production lines remaining idle and unproductive, **unless it is utilised for exports.** It was also opined that Private **Industry should be allowed to partner with MIL/ YIL/ DPSUs for exports.** Examples of low quantities over 10 years were cited to substantiate the financial unviability of harnessing critical technologies for limited requirements eg BMCS for 155mm and 4 variants of 155mm Shells, both spanning 10 years.
Licensing	Industry representatives felt that even if their products do not meet 100% QRs, a certification stating the extent to which the product met the criterion would help the industry offer the product for exports.
Certification	It was argued that though the licensing norms had been opened up and liberalised, not more than 15-20 licenses had been approved for munitions.

- **DPSUs, MIL and YIL**

They expressed a strong support for the SPV model.

Industry	(i) They exhorted the Private Industry to exploit the SRIJAN Portal to exploit unprecedented opportunities.
	(ii) The ability to exploit growing export opportunities, even by resorting to early exports after developing a product, was highlighted.

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KEY TAKEAWAYS

- **DPSUs, MIL and YIL**

Ammunition	(i) There was a willingness to partner with the Industry to meet orders spanning 10 years, citing the example of ammunition for Dhanush as a possibility, by sharing the blueprints.
	(ii) The user was assured of 18 years life guarantee.
Infrastructure	There was **great optimism in partnering with the industry to create and develop new infrastructure, including indigenisation of plants** for explosives, to design and develop products.
QA/QC	Apportioning the process QA/ QC responsibility to the manufacturers was deemed an enabling provision.

- **DRDO**

The DRDO led **DcPP and TDF projects** in progress with the industry enthused all stakeholders.

Policy	It was also opined that a **spiral developmen**t approach of fielding an acceptable prototype, followed by improved versions in an accelerated manner would be a desirable approach.
Ammunition	(i) **Development of several advanced munitions like** DPICM, ERAP, CCF, Precision Guidance Kits, Proximity fuzes, Man-portable Drone Based Combat (MIDAS), Avalanche Triggering Grenade, roof-buster, UAV Launched PGM,; Underwater drones, HAPS & ALFA with Newspace Technologies; JVPC and UBGL indigenisation solutions were highlighted.

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KEY TAKEAWAYS

- **DRDO**

Ammunition	(ii) Export Potential. Amn ie FSAPDS (Practice) for T series of tanks, HESH, Multimode Grenades etc has been developed and it had passed the trials also, now it is imposed to be given to the Services for use. **For Multimode Grenades they had orders from foreign countries also and there will be ToT for these countries.** Penetration-cum-Blast (PCB) and Thermobaric (TB) amn has also been developed by the DRDO. ToT for these should enable the private industry.
Shelf Life Assessment	SA/ Mines/ Explosives are stored for decades, and have a Long Product Life. They are safe and life extension procedures are in place. DRDO/ HEMRL/ DGQA and also the industry have set up state-of-the-art facilities for testing/ ensuring shelf life in terms of quality and reliability.

- **Academia**

Ammunition / R&D	(i) Active contribution of IIT Madras, the only institution mandated for explosives related R&D, was highlighted, especially as regards Ramjet Technology for 155mm Artillery projectiles for all weapon systems. Development of 125mm FSAPDS with BEL, for achieving DOP greater than 530mm was mentioned.
	(ii) Intelligent munitions are being developed with IIT Delhi.
Users	IIT Madras offered to conduct tailor made Post-graduate programmes for Users (Services) as well as DPSUs/MIL/YIL/Private Industry. MIL evinced the interest.

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RECOMMENDATIONS

Munitions have been opened to the Private Industry with considerable lag after weapon systems. ***User requirements of munitions could be broadly categorised*** under extant in-service munitions, which are almost 80%-90% indigenous; imported munitions/components and advanced munitions yet to be developed or procured. Each of these categories calls for a different policy paradigm. While technology for munitions presently being produced indigenously could easily be transferred to the private industry to enhance the capacities at the National level, it would entail duplication of efforts, besides loss of revenue for DPSUs/MIL/YIL. On the other hand, if the private sector focuses primarily on import substitution through Make in India projects and design & development of advanced munitions, with no assurance of successful outcomes, low or no ROI on huge initial investments will not incentivise the Private Industry. Moreover, ammunition is procured through both DAP-2020 (Capital) and DPM-2009 (Revenue) routes. Unlike weapon platforms, development of munitions calls for experimentation in the real world, with real weapon systems/platforms, which most private players are unlikely to have. Therefore, the munitions ecosystem has nuanced dynamics and calls for a flexibility in relevant policies and approach.

- **Policy**

Flexible Approach	For amn, which is imported, to be developed by Industry, it is not easy to get to the prototype stage with indigenous content which was feasible with the foreign vendors for weapon systems. For setting up a facility in India with a foreign vendor, FOEM is not likely to agree for providing ToT/ IPR, because ammunition licenses are controlled by foreign Governments. **Hence, a flexible approach is necessary for munitions**. It can be terms of IPBG (Integrity Pact Bank Guarantee), private industry bidding for more than 3 types of RFP etc.
Bidding Criteria	Various policies including multiple participation by the bidders, financial eligibility, and issue of credit rating may be relaxed further to incentivise industry participation in defence production.
Time to Respond to RFP	The time to respond to RFP is **3 months timeframe, which is too short for responding** to RFPs for tank/ artillery munitions. It should be a **minimum of 4-6 months.**

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RECOMMENDATIONS

- **Policy**

Rate Contract	**Provision for a Rate Contract for the supply of regular ammunition is recommended.** The commercial quotes should remain valid for a period of certain years. Predictive costing for a period of certain years is not viable due to a large number of intangible attributes in the costing of military goods, therefore, Rate contracts provide a viable solution.
Make II Route	Design, development and R&D for the prototype(s) needs time and financial resources. Though the users now prefer the Make II Route, the private companies find it unviable. **Make II cases can be a success story for ammunition manufacturing ecosystem in India, only if the Govt provides assurance and monetary incentives, and relaxses the Indigenous content criterion on a case-by-case basis.**
Make II & III Route	Indian firms may manufacture ammunition either in collaboration or with ToT from foreign OEMs. In this category, an Indian vendor can enter into a JV with OEM. **The restrictions of 60% IC at the prototype stage should be relaxed.** It was also opined that 100% indigenisation is not feasible since the FOEM may not hold IPR for 100% components. Another argument was that in **case the material itself is not available in India**, it should not be discounted while determining the IC percentage.
DPSU/MIL plus 1 industry player	The Model of **DPSU/ MIL plus 1 industry player** can be adopted by the Government. Facilitate and stabilise at least two manufacturers (including Munitions India Ltd) for every type of ammunition. For ammunition products where Munitions India Ltd is an established and sole supplier, the participation of MIL in RFPs may be restricted to enable a second source to emerge and stabilise.

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RECOMMENDATIONS

- **Policy**

Long/ Mid Terms Plans must be Intimated to the Industry	The industry should be intimated of the Long/ Mid-term procurement plans. **More transparency and a collaborative environment are required** for better outcome delivery.
Import and storage of Explosives	It is difficult to store or import ammunition by any private player even if they have an explosive partner. Therefore, private companies and their foreign partners have to depend on Armed Forces for storage, transport and escort. This gives monopoly to DPSUs and a few Explosive companies. This needs to be reviewed and redressed.
Export Potential	(i) More thought should be given to the vast export potential for the private industry. **There is the potential for ammunition exports, which must be exploited by exporting the "System" i.e weapon as well as ammunition.** Examples are the Akash missile, Brahmos System etc.
	(ii) Since the shelf life of munitions exceeds 10 years, a manufacturer may secure only one to two orders, resulting in production lines remaining idle and unproductive, **unless it is utilised for exports. Private Industry should be allowed to partner with MIL/ YIL/ DPSUs for exports.**
	(iii) **Incentivize, Investment and ToT/ IPR by FOEM.** A policy to allow Indian manufacturers to export will also incentivize FOEM to collaborate in Make 3 cases, with ToT and IPR. **(iv) Single Window Processing** Minimise processes and have a single window model for ammunition exports by industry.

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RECOMMENDATIONS

- **Policy**

Availability of AHSP/ Drawings	**It is desirable** that the AHSP/ drawings availability should be dovetailed in the OTE, which can provide the private industry a greater clarity for a time-bound response by the industry.
Policy for QA/ QC and Trials for CAPFs.	CAPFs were earlier dependent on OFB for ammunition and on DGQA for QA/ QC and trials. With the industry making the ammunition for CAPFs, a new 4% inspection charges have been added by DGQA on the tender amount. An early review and resolution of the challenges of procurement, QA/ QC and testing/ trials for the CAPFs by DDP/ MoD and MHA is recommended..

- **DRDO/DPSUs/Industry**

Apart from the MoD/ DDP, the industry needs to proactively engage with the Services to establish and nurture a defence ecosystem that would produce quality, state-of-the-art weapon systems.

Timely Supplies and Satisfactory Post Sale Services	Once the contract is given to the DPSUs/ Private Industry, timely supply is more important and post-sale services must be good. Provisions should be made to ensure that slippages and delays result in automatic activation of penalty clauses to enhance accountability.
Time Bound Indigenisation of Positive List Items	(i) **<u>Critical Items Import Dependence</u>**. Shedding import dependence for ammunition of Tavor Rifles, AMR, AGL, Dragunov Sniper Rifle, UBGL, MGL should be accorded priority.

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- **DRDO/DPSUs/ Industry**

Time Bound Indigenisation of Positive List Items	(ii) From the list of indigenization ie First list, Second list and the Third list, only till now only **12 types of items (in revenue route) have been bid by the private industry/ DPSUs. The balance items (starting from Dec 2021 till Dec 2027) have not open for bidding yet**. It takes almost 3 years after the contract is finalized for the services to get the ammunition. It is **recommended that regular interaction be done between DDP and Industry/ DPSUs/ MIL/ YIL to ascertain which route to take - Make II/ Make III by industry, or based on Revenue RFI/ RFP or Make-I.** (iii) **SA, Mines, and Explosives.** These form part of Positive Indigenization List, and should be prioritized, being easier to indigenise.
SRIJAN Portal	MoD has an indigenization portal ie SRIJAN, on which the items/ components are uploaded by DPSUs/ Industry for MSME/ Startups for indigenization.This should be exploited by MSMEs in particular.
ToT Provisions	It is recommended that for kinetic munitions, where explosives do not play a major role, ToT should be to the Primary OEM for the kinetic component, and not to the partner for explosives.
UAVs and Loitering Munitions	DRDO brought out that various payloads such as Pre-fragmented and EFP cum fragmented payload for UAVs have been developed and are available for TOT, which should be expedited.
Enhancing iDEX and TDF Outcomes	Based on success and experience gained in these innovative approaches, the provisions should be consistently reviewed and refined.

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- **DRDO/DPSUs/ Industry**

Incentivisation of Design and Development	To achieve 100% Aatmnirbharta in defence manufacturing, the industry needs to foray into niche sectors like the manufacturing of fuzes, seekers, missile engines, etc. Munition design should facilitate integration and use with multiple platforms (eg aircraft, helicopters, UAVs). **This would need investment in R&D as well as infrastructure and suitable incentives are needed from the Government.**
R&D for New Advanced Munitions	Setting up a new design and research organization as an alternative to DRDO, to infuse competition in R&D, is recommended. IIT (Madras) is setting up a **Centre for Ammunition Research and Development (CARD),** which will interact with all stakeholders, to enhance Precision, Lethality, Range and Intelligence.
New Infrastructure/ Capacity	(a) DPSUs/ MIL/ YIL should collaborate **with the industry to mutually create and develop new infrastructure, including indigenisation of plants** for explosives, to design and develop products. (b) **Existing Infrastructure.** The existing infrastructure for amn should optimally used by diversifying the products.

- **Users/ Academia**

Test /Trial Infrastructure/ Proof Ranges	To sustain the indigenization efforts through private industry, it was suggested that a policy on sharing of test/ infrastructure facilities/ Proof Ranges available with DRDO and the Services with financial implications, be issued at the earliest.

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- **Users/ Academia**

Requirements For Trials	The trials and the number of ammunition rounds sought is still as high as is sought from FOEMs. There is no change in the DGQA and User processes or the number of rounds required. The fact that these will be made in India, should call for an overall reduction in the number of rounds required for trials, since these are unaffordable as regards missiles and rockets.
QRs for Manufacturing and Spiral Development	The QRs must be commensurate with what is achievable, given the technology available in the country (DPSUs/ OFBs). These should be at par with products from FOEM, and not higher, to begin with. Spiral development will provide better amn progressively which can be developed as Mk 1, 2 etc.
Collaboration Role by Academia	Involvement of academia is a key feature of ensuring the production of reliable products having better design and highest quality standards.
Studies on Amn Technology	There is a need for the Services and scientists to study Amn Technologies. IIT Madras and other IITs have the necessary environment and infrastructure for this. MIL has already inked an MoU with the IIT Madras for sponsored M.Tech courses in Amn Technologies. IIT-M only has policy clearance for research in Explosives. This should be extended to other Centres of Excellence/ IITs.

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- **QA/ QC and Certification Process**

QA/ QC	Though MIL & YIL have assured highest standards of QA/ QC for manufacturing processes, **the highest standard of quality and reliability should be ensured through audits.** Single point accountability ie, Design, Production, and Quality Assurance is a recommended option.
Certification	Innovative products developed by Indian companies, which have not been demanded by the defence forces, are not given design certification by CEMILAC/ DGQA, which **inhibits the Indian Industry to participate in global tenders.** A mechanism is needed to allow Indian companies designing innovative products to use test sites as well as obtain certifications on payment, even if they do not fully match the QRs for indigenous procurement. M/s MIL has proposed that Services may issue a certificate of testing and evaluation for the specification which the product can achieve. **This certification will help industries to export the items to other countries where these specification standards are accepatable.**

- **Licensing Process**

Industrial License	License for military equipment (including ammunition) is still delayed compared to the expectations. Some sort of transparency needs to be established in the grant of license or denial of a license. The applicant should receive adequate information on why the license is being denied. Regular feedback mechanism and intimation to the industry as regards details about information lacking in their applications and well as the status of applications is needed.

SEMINAR REPORT ON 2ND CONFERENCE ON MILITARY AMMUNITION "AMMO INDIA 2022" HELD ON 27 – 28 JUL 2022

RECOMMENDATIONS

Export/ Import License	Due to restriction of minimum Indigenous content, Indian dealers are unable to offer critical imported items. This results in delay in the procurement of raw material / spares/ accessories of foreign origin. Government may review the Import policies, for ease of supply chain management.

CONCLUSION

The enthusiasm of the industry in arms and ammunition was palpable. The MoD should expedite trials of all import substitution options that are available from the Indian industry in a time-bound manner, provided the Indian OEM demonstrates that the products to match GSQR's. Perfection in one single go should not be expected from the private sector, especially since the sector is just a few years old and still taking baby steps. Instead, the objective should be to handhold and quickly gather speed, so that a stage short of perfection is achieved, with little or no reliance on foreign technology. This way, the military will have global standard munitions, in a very short time.

The present policy of ammunition manufacture juxtaposed with the volumes required, provides unique opportunities to the Private industry to develop the capacity and capability and engage in Joint Ventures with foreign OEMs. As such, several overseas defence companies, are already negotiating with private Indian companies to provide cutting-edge technology for the manufacture of multiple ammunition programs. While the recent policy initiatives of the Government are welcome, the recommendations of the Industry need to be considered by stakeholders in the right earnest for furtherance of Make in India, fostering the growth of the domestic defence industry and ensuring requisite preparedness of the armed forces.

Design, R&D, production and procurement of munitions by the Private Industry is very different from other defence products. Policies should be tailored to incentivize the participation of Private Industry by suitably amending the draft DPM 2021, along the lines of the RFPs issued in 2017 where parameters were judiciously modified.

ABOUT CENJOWS

CENJOWS was raised at the initiative of Ministry of Defence on August 24 2007 and is registered under 'The Societies Registeration Act 1860'. The Centre has been set up to

- Examine joint warfare and synergy issues in their entirety.
- Provide the much-needed interface between various stake holders, viz the government, public and private sector, academia, NGOs and civil society
- Initiate debates and discussions in an independent and unbiased milieu for emergence of best policy alternatives.

Misssion

To promote Integration as a synergestic enabler for the growth of Integrated National Power and provide alternatives in all dimensions of its applications through focused research and debate.

ABOUT FICCI

Established in 1927, FICCI is the largest and oldest apex business organisation in India. Its history is closely interwoven with India's struggle for independence, its industrialization, and its emergence as one of the most rapidly growing global economies.

A non-government, not-for-profit organisation, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies.

FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.

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