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Make-II: need to prevent duplication of efforts and backdoor entry of import

By Laxman Kumar Behera

In a major boost to Make in India and private sector's participation in defence production in particular, the Defence Acquisition Council (DAC) on October 21 approved three capital procurement projects worth Rs. 3300 crore for indigenous design and development. ¹ The first two projects pertain to Make-II category of the defence procurement procedure (DPP) and include third generation anti-tank guided missiles (ATGM) and auxiliary power units (APUs) for the T-72 and T-90 tanks. The third project relates to the design and development (D&D) of electronic warfare (EW) systems for mountain and high-altitude terrain by the Defence Research and Development Organisation (DRDO), and manufacturing of the same by a design-cum-production partner selected from the Indian industry.

The importance of DAC's October 21 decision is that it is the first time that the government has allowed the private sector to undertake D&D of complex defence equipment, a task which was hitherto reserved for the DRDO and, to a smaller extent, state-owned/controlled production entities. The government's bold decision to allow the private sector to undertake complex D&D is a step in the right direction to forge a larger innovation system to meet the diverse requirements of national security. However, caution may be required to avoid duplication of efforts and prevent indirect import which is otherwise not permitted directly.

It is significant to note that of the two projects approved by DAC under Make-II, the DRDO is already engaged in the development of ATGM. The R&D agency seems to have achieved a degree of success in the project. This is the reason why the government has twice ignored in the past an import option in favour of the home-grown project. However, permitting the private sector to undertake the development of ATGM has raised doubts about the status of the DRDO's project. More significantly, if the DRDO, India's premier defence R&D agency with a budget of more than Rs. 19,000 crore (in 2019-20), is not able to design and develop an ATGM, how could the private sector, which has little expertise in missile development, achieve the same and that too with no funding support from the government under Make-II?

The Make-II procedure was carved out as a separate sub-category of the 'Make' procedure as part of the revised DPP-2016 to give a boost to the Make in India initiative in defence production. The intention behind the sub-category was to leverage the industrial and financial powers of the Indian industry, particularly the private sector, for greater indigenisation through import substitution with some technical assistance from overseas, if required. Leveraging industry's financial power was, however, not meant to ask the industry to spend a huge sum on D&D efforts. Therefore, projects with a large developmental cost was meant to be executed through Make-I procedure in which the government bears up to 90 per cent of the prototype development cost, whereas all other projects with smaller financial implications were intended to be executed under Make-II through industry's self-funding.

The Make-II is undoubtedly a novel idea of the Ministry of Defence (MoD) to promote innovation within the industry. Its three distinct features – allowing the industry to submit *suo moto* proposals, MoD's willingness to entertain single bid, and assurance of time-bound and guaranteed order post successful development – are refreshingly different from the government's routine contractual norms that give prominence to tender-based bid solicitation, multi-vendor participation and uncertainty of order placement. The innovativeness of the sub-category and the government's zero financial liability

for prototype development has allowed the MoD to go the whole hog in embracing a large number of proposals under Make-II. In comparison to mere three projects under Make-I, the MoD has so far accorded acceptance-in-principle (AIP) to nearly five dozen proposals under Make-II.

Significantly, apart from ATGM, the AIP has also been given to a number of other big projects including the long range air-to-air beyond visual range (BVR) missile, on which the DRDO has been working for a long time and has achieved some major success in recent years. By allowing these projects to be executed through Make-II, the MoD not only runs the risks of forgoing the opportunity of deploying its home-grown technology but unwittingly gets into a trap of foreign suppliers who rarely pass on any key technology and whose only interest in India is to bind it with perpetual dependency.

The question, therefore, is whether the foreign original equipment manufacturers (OEMs) should be allowed to use Make-II to sell their hardware which they are otherwise denied to do directly. The question merits debate as it has a huge implication on India's own efforts in developing key defence technologies. Even though Make-II requires local design and development and a minimum 40 per cent indigenous content (IC), it nonetheless leaves a plenty of scope for technology assistance from external sources which allows foreign companies an opportunity to push their products, albeit indirectly, through Indian partners who are willing to play a second fiddle to their overseas collaborators. In their attempt to sell their products, the foreign companies also do not hesitate in exploiting the age-old turf wars between key stakeholders of the Indian defence establishment.

As of now, the Indian defence companies, especially the ones from the private sector have very little capability of designing and developing complex weapon systems, and that too in a period of 105 weeks, the maximum time allowed under Make-II for user trial of prototype. If a company claims it could do so, it is important for the MoD to decipher the real motives, examine what new technologies are being promised to be developed, and see to it that the company has the overall intellectual property rights (IPR), including for exports. Furthermore, when the government has already sanctioned a developmental project to the DRDO, or any other agency, which involves a significant investment of taxpayers' money, it is important for the MoD to ensure that such projects are delivered on time before a parallel development is sought outside.

This is not to suggest that the DRDO, or any other state-owned/controlled agencies, should have exclusive monopoly over all developmental projects approved under Make-II. In fact, the Make-II procedure categorically states that projects once approved would not be retracted just because India's premier defence R&D agency is developing such projects. However, such restraint on the DRDO appears to be based on the organisation's chequered past, and not on the organisation's stellar contribution especially to strategic programmes. Identifying the issues and concerns of DRDO's R&D projects, including in the post-developmental phase, and addressing them in a time bound manner is far more important than marginalising the organisation in favour of parallel development within the industry. Suffice to say that the DRDO is currently engaged with nearly 370 R&D projects (excluding strategic ones) with government making an investment commitment of over Rs. 78,000 crore.² The MoD could least afford to ignore its premier R&D agency and all the sanctioned projects and rely on an industry whose R&D effort is hardly anything.

The MoD has already taken a host of initiatives to contain India's arms import and enhance self-reliance. These initiatives have started paying dividend as is evident from the continuous increase in domestic arms production and phenomenal increase in defence exports. Further, the MoD is presently engaged in implementing a major plan for the defence public sector undertakings for the indigenisation of Rs. 15,000 crore worth of previously imported items by 2022-23.³ The Make-II is ideally suited for import substitution of these types of items and all efforts need to be undertaken to make it a success. The MoD needs to send a strong signal that Make-II is not to kill India's own technology development but to supplement it.

(Laxman Kumar Behera is Research Fellow at Institute for Defence Studies and Analyses, New Delhi. Views expressed are of the author and do not necessarily reflect the views of the IDSA or of the Government of India.)

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Military, handhold Indian designers

By Priyan R Naik

Indian designers have a reputation for ‘frugal engineering’. Sensitive to a low-resource environment, yet oriented towards creating products and solutions uniquely suited to our needs, Indians are nely tuned to create cost-effective solutions to local problems. The world took notice of Indians’ frugal innovation efforts aer the development of the Tata Nano, the ultra low-cost car designed and developed by Indian engineers, competent at combining low cost with high value, reassuring the very strong multinational R&D presence in India.

Yet, when it comes to military equipment, why do Indian efforts fall short? Why don’t Indian designers’ efforts throw up signicant successes instead of giving India the dubious distinction of being the world’s largest importer of military hardware, importing more than 70% of its defence requirements?

Look at Tejas, the Light Combat Aircra sanctioned in 1986 to the Defence Research and Development Organization (DRDO). The prototype took ight in 2003, 17 years later, whereas design and development from basic stage to prototype ight takes 8-10 years the world over. The program management was assigned to the Aeronautical Development Agency (ADA) which, along with Hindustan Aeronautics Limited (HAL), National Aerospace Laboratories (NAL) and the Aeronautical Development Establishment (ADE), was expected to bring out the prototype. The design, weight consideration, mock-up, systems and evaluations, purchase of the avionic and hydraulic systems, conceptualizing the aircra and conguring it, incorporating the y-by-wire control systems, use of carbon-ber composites for the major structures were difcult and time-consuming. A technology demonstration ight in 2001 was followed by the prototype ight test at the National Flight Test Center (NFTC), ultimately leading to the ‘Final Operational Clearance’ and induction into the Air Force in mid-2018.

While all delays get attributed to HAL, the manufacturer, the government had taken its own time to allocate responsibilities between HAL, ADA, ADE and NAL. The delays in development was familiar with and design changes that required lots of ‘Redo’ work, resulting in cost and time overruns.

Similarly, the design and development of the Main Battle Tank (MBT) Arjun, a multi-laboratory program of DRDO, led by the Combat Vehicles Research & Development Establishment (CVRDE), requiring the development of the transmission, hydro-pneumatic suspension, hull and turret, and the Gun Control System. Though the development of the tank began in 1972, it was only in 1996 that mass-production at the Ordnance Factory’s Avadi facility began. Here too, cost and time overruns and repeated delays resulted in the Army requiring multiple revisits due to advances in technology and changes in the threat environment. The more the tank project dragged on, the more the tank needed to be redesigned to incorporate new technologies, major design decisions became obsolete, with delays causing the Army to order more Russian T-90 tanks, further undermining CVRDE’s developmental efforts.

To the credit of the CVRDE designers, however, the Arjun held its own in the comparative trials held in 2010. On certain key operational parameters, like ammunition loading, tactical manoeuvres and ring, the Arjun was comparable to the T-90. On mobility and manoeuvrability parameters, it was better than the T-90! The ring system was able to achieve a superior accuracy and hit-rate due to the indigenously designed hydro-pneumatic suspension that allows the Arjun to glide over undulating cross-country terrain at full speed keeping the gun stable enough to re accurately.

CVRDE unveiled a Mark-2 version of the Arjun exhibiting qualities of a genuine world-beater, incorporating changes at the army's persuasion. Faced with an army long familiar with Russian tanks, logistic problems due to the Arjun's weight and dimensions were addressed through the Sarvatra system, an indigenously built bridge-layer, while the Indian Railways deployed a bogey called BFAT (Bogey Flat Arjun Type) designed to transport the tank to operational areas.

Both the indigenous Tejas LCA and the Arjun MBT have had protracted development phases, overcoming not just technical challenges in development but criticism from groups believing either in outright purchase or in licensed manufacturing through a technology partner. The indigenous development and production route, being relatively difficult, time-consuming and requiring vast coordination, remained the last choice, with even the government clamouring for the private sector and foreign wares to get "quick results"!

Criticism cannot be a reason to stie the growth of indigenously built platforms. The armed forces must play a pivotal role in indigenizing defence equipment by handholding the Indian designer. Motivation and encouragement at crucial junctures makes the designer take delight in delivering equipment as per specifications. Remember, we are the same people who used home-grown technologies to send Mangalyaan to Mars successfully on the very first attempt, and at a cost less than the cost of producing a Hollywood movie!

(The writer is a former director on the Board of BEML)

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