

Doctrine of Self Reliance in Defence Technologies: Road to Nowhere or Way to Go?

KG Narayanan*

There is a strong case for factoring in the impact of defence acquisitions on national economy, industrial capabilities and employment generation. Indigenous systems cannot be promoted without firm conviction on its rationale and advantages. Major systemic changes will have to be effected in the process of requirements generation, development and manufacturing, test and evaluation in order to make progress towards greater self reliance.

India's Defence Procurement Procedure (DPP) is evolving rapidly in its many dimensions such as offsets, FDI, transparency and probity. The ultimate users of weapons and systems – Indian Armed Forces – are the critical stake holders in the acquisition process; they have every reason to expect earnestly that the changes that will be effected are the improvements they have been waiting for. The other major stake holder in the acquisition process is the Indian industry – PSUs and private industries alike - which stands to gain or lose a great deal depending on

The ultimate users of weapons and systems – Indian Armed Forces – are the critical stake holders in the acquisition process; they have every reason to expect earnestly that the changes that will be effected are the improvements they have been waiting for.

the directions taken by the new acquisition strategy and its implementation. There is, of course, the inevitable interest of foreign weapons and systems manufacturers who are keen to intercept the large opportunities on the Indian horizon.

We tend to forget or ignore some other stakeholders who ought to be equally interested in defence acquisitions. They are the managers of national economy, finance, employment and human resources. The connection may not be obvious - or the link has been broken by long disuse. Explicitly stated, defence acquisitions have significant impact on national economies, financial health, employment / skills generation and human development index. Therefore ministries and departments which oversee these aspects should consider themselves

stake holders in the revamping of defence acquisition.

As an expression, Defence Industrial Base (DIB) is a synonym of an expression which was in vogue earlier - Military Industrial Complex. The term MIC developed

* KG Narayanan is a Former Chief Adviser, DRDO.

a bad odour with its Eisenhowerian connotation - as an entity which might usurp undue influence in national policies and economics.¹ In that sense, DIB too might be charged with developing a vested interest in war and in creating warlike situations. Therefore empowering DIB might be an invitation to a situation of unaffordable security posture - clearly not in the interests of a democratic nation with vast unfulfilled developmental needs. Many studies have appeared analyzing the structure, performance and limitations of DIB in various countries such as USA, UK and Sweden. A comprehensive analysis was made by Prof John Dunne at the London School of Economics examining the positive and negative impacts of the DIB on national economy.²

China has shown a distinct downward drive in arms imports and upward trend in self sufficiency leaving India in the company of Saudi Arabia and others.

In a recent statement, the Honourable Raksha Mantri, Shri AK Antony, has described the present situation of excessive dependence on imported weapon systems as “unfortunate and painful” and “unacceptable”³. The ministerial anguish is understandable considering the dubious reputation recently gained by India as being among the top two or three arms importers in the world. According to a recent SIPRI report⁴, even China has shown a distinct downward drive in arms imports and upward trend in self sufficiency leaving India in

the company of Saudi Arabia and others. This explicit ministerial statement articulating the importance of self reliance comes after a long break. Although the officially stated policy in the early 1990s was to achieve a target of 70% self reliance by the year 2005, self reliance in defence systems clearly took a back seat for well over a decade in post Kargil India. Even the formal structure established in the MoD to monitor and guide progress towards this self reliance goal seems to have disappeared. Various doctrine statements published by the Services and other agencies over the last decade (with the exception of the Minimum Nuclear Deterrence doctrine) do not mention the need for promoting self reliance or assign a role to it. As the national debate on Defence Procurement Policy intensified, there was some demand for “level playing ground” for imports and indigenous systems in defence acquisitions. Acquiring a weapon system incorporating advanced “state-of-the-art” technology was mis-stated as (and equated to) acquiring the technology itself. For instance, visions of India becoming a world class air power were projected without a corresponding strategy to become an aeronautical power. A former senior defence functionary even labeled self reliance “a self inflicted pain” - as outmoded as socialism.

Various doctrine statements published by the Services and other agencies over the last decade (with the exception of the Minimum Nuclear Deterrence doctrine) do not mention the need for promoting self reliance or assign a role to it.

As the first generation indigenous systems projects such as MBT, LCA, guided missiles, UAVs, radars, electronic warfare equipment etc taken up during the 1980s and 1990s by DRDO, DPSUs and OF seriously overshot their time schedules and failed to show up as inductions in the Armed forces inventory even 15-20 years after their commencement, there were legitimate concerns on the mission effectiveness of indigenous development route. The unfortunate occurrence of the Kargil events in 1999 and the worsened situation in the low intensity conflict in the hills added to the sense of “panic”. Reports of failures, performance shortfalls and delays in the indigenous systems became abundant in public domain – sometimes without the required level of concern for facts or balance. Some of the discourse in the media probably falls in the “paid news” category.

The unfortunate occurrence of the Kargil events in 1999 and the worsened situation in the low intensity conflict in the hills added to the sense of “panic”.

Both the delays in indigenous development programmes as well as large dependence on imports have attracted strong criticism from CAG. Other critics and analysts have described India as “remaining incorrigibly dependent on imports and serving as a dumping ground for obsolescent weapons” and have even suggested 3-year moratorium on imports.⁵

Government has been sensitive to the criticism that the indigenous defence technology system is not performing to its potential. Committees have been set up and recommendations made to improve the situation.⁶ These reports and recommendations do not seem to have reached the public domain officially. One hopes that the recommendations and actions deal with the underlying causes rather than symptoms and peripheral issues. If the concern reflected in RM’s recent statement leads to coherent action to achieve targeted levels of self reliance it will be a very welcome development – not only from the limited point of view of enhancing effectiveness of defence system but also from national development, economics and employment generation angles. Designing improvements in the existing system and implementing them will need a better understanding of the rationale and objectives of promoting self reliance and of the hindrances to its progress.

Self reliance is more than minimizing imports. It is a positive concept of promoting and enabling the national research, development and manufacturing sectors to fulfill their strategic mandate which states that the nation of India’s size, resources and potential must not have to look elsewhere for major weapons and defence systems for want of technical capabilities. It is also the method by which the resources unavoidably spent on acquisitions for security might be made to contribute to national industrial development and employment generation. The merit of a policy of making defence expenditure work simultaneously for national

The merit of a policy of making defence expenditure work simultaneously for national development is well recognized globally and is an imperative in developing economies such as ours with vast unfulfilled demands in poverty alleviation, health care and , education of the people and in infrastructure development.

development is well recognized globally and is an imperative in developing economies such as ours with vast unfulfilled demands in poverty alleviation, health care and education of the people and in infrastructure development.

The primary case for self reliance in defence systems was stated in clear terms by Prof. PMS Blackett in his seminal report submitted in 1948 to Prime Minister Nehru who sought his advice on establishing a defence industry in newly independent India.⁷ Taking note of the near total absence of sophisticated technological capabilities, Blackett made a case for a gradual and long term build up to achieve self reliance. One of his key recommendations was that India should develop strategic and tactical military doctrines that would enable her to manage defence adequately with indigenous (less advanced) weapons even while making strenuous efforts to build up world class technology capabilities.

Undoubtedly, the global security environment has changed greatly since the time we became independent. Influence of cold war alignments in

the sub-continental power balance, post cold war realignment of global power, emergence of a new super power in China, spread of nuclear weapons, role of non-state actors and asymmetric warfare have emerged as key issues in security threat perceptions. There is also a blurring of dividing lines between external threats and insurgencies / internal chaos. None of these new developments, however, reduce the importance of being self reliant in the defence sector, as emphasized by Blacket and accepted by successive Governments as policy.

Globally, self reliance in defence is the rule among developed nations (USA, UK, France, Germany etc.). Analysis of data on value of arms imports as a proportion of total imports of each these nations clearly indicates the importance attached by of these nations to the goal of being self reliant in defence. Typically, these countries which are permanent members of UN Security Council and other prominent members of EU limit their arms imports to be under 1% of their total imports. Current figures for India appear to be higher and are, in some years, on par with nations which do not claim to possess any technology base at all.

The Indian case is unique. There is no other nation which possesses such impressive science and technology capabilities to build satellites and launch vehicles, build IRBMs, contemporary fighter planes, nuclear weapons and be counted as a leading

global power in Information technology – and is yet dependent so deeply and extensively on imports for defence systems.

It is not mindless autarkism in the modern globalised era to insist on self reliance in defence. It is a practical philosophy which takes due note of strategic, political and economic realities. The motivations for being self reliant in defence systems are many and varied. Most important among them are

- cost effectiveness in the life cycle
- dependability of continued supplies
- avoiding security compromises
- employment generation

Different combinations of these factors apply in different countries and situations. The Prime Minister has suggested recently that “we can pursue greater self reliance by creating inter-relationships and inter-dependence that enhance our bargaining power.”⁸

The logic of minimizing security compromises in indigenous systems is widely and correctly appreciated. The cost effectiveness of the indigenous systems does not happen automatically. In a badly organized indigenous development and production chain, the contrary might come true. Conscious and systematic efforts will have to be made – including adoption of strict value engineering principles. Incremental cost of high end specifications should not be lost sight of while formulating requirements. Dependability of supplies and ensuring high quality of product support during life cycle will also pose challenges – especially when the production base is spread well beyond the Government sector into the private industry. It is useful to remember that these challenges remain even with regard to wholly imported systems and license manufacture. These are challenges to be met and countered in order to reap the larger benefits arising out of self reliance.

The Prime Minister has suggested recently that “we can pursue greater self reliance by creating inter-relationships and inter-dependence that enhance our bargaining power.”

In particular, the potential of defence systems to generate substantial employments among skilled personnel is a great advantage to national economic wellbeing and must become an important driver in defence acquisition programmes. One suspects this is presently a non-factor in decision making. Typically, indigenous development and manufacture of 1,000 tanks of MBT class with a production value of Rs 25,000 crores over a 10 year period can be expected to provide steady employment to about 3,000 technical and managerial personnel and be the source of livelihood for

15 - 20,000 Indian citizens. Similarly manufacture 200 fighter aircraft of LCA class with over 75% of its value added in India (design, development, manufacturing, maintenance cycle) will generate employment for over 5,000 persons. These are not trivial gains to the national economy to be thrown away in the midst of arguments on QR compliances and turf ownership.

It is widely accepted that the main motivation for the aggressive drive made by the West, Israel and other countries in exporting arms is to preserve job levels in the dwindling defence market in the post-cold war world. The GOI is straining

Emphasis is on employment oriented export strategies. Surely, an employment oriented import avoidance strategy should be an integral part of this policy.

every nerve to achieve employment led growth of the economy. Emphasis is on employment oriented export strategies. Surely, an employment oriented import avoidance strategy should be an integral part of this policy. To forego the great employment generation opportunity which the domestic defence demand presents will not be considered wise management of national resources.

Irrespective of which of the motivations apply in Indian context, the bed rock on which the self reliance must rest has to be a sound and robust DIB with inherent strengths in the entire chain of activities encompassing research, design,

development, test & evaluation, manufacture, quality assurance, life time product support including upgrades. In order to complete the picture, we must also include the processes and agencies involved in generation and approval of requirements and those involved in providing resources. These entities must interact very closely and “sympathetically” with the DIB in order to be effective in their inputs. This is a very large canvas involving organizations and groups in the defence services, government, DRDO and the public and private industry for providing coherent directions from project to project and from stage to stage as attempted thus far.

Analysis of past experience clearly illustrates how indigenous projects have floundered on indigenous rocks – not to mention liquidation by foreign competition. Mere MOUs, contracts, and administrative instructions have not been successful in achieving the required degree of synergy and harmony among the players. What is needed is a well designed policy of emphasising indigenous systems as the preferred route, articulated at the highest level, with specific goals of achieving substantial self reliance levels progressively. Operational features of this policy have to be duly elaborated in order to be effective. In addition, positive motivational gradients of the participating agencies, public or private, have to be established and aligned deliberately (and not left to wishful thinking) to maximize probability of achieving the self reliance goal. Negative trends in the system have to be monitored and eliminated constantly.

Goal setting starts with understanding where we are. Good and accurate data and an objective analysis of historical performance are needed.

Goal setting starts with understanding where we are. Good and accurate data and an objective analysis of historical performance are needed. There are varying estimates for the present level of self reliance – around 70% - depending on definitions. Defining indigenous systems as those which are designed and developed as prototypes in an Indian R&D centre leading to production in a manufacturing unit in India, it is evident from current inventories of Army, Navy and Air Force that the value of indigenous systems might be even lower than 25% in several key segments such as

armour, artillery, aviation, EW, guided weapons, ships, submarines etc. Factoring an appropriate value addition index to systems manufactured in India under license (such as Jaguar and SU-30 MKI aircraft, T-90 MBT, Scorpene submarine etc) and those developed collaboratively (eg. Brahmos cruise missile), this proportion will be a little higher.

Going by published reports, it is expected that there will be a steep upward climb of indigenous production value in the near future with the induction of LCA Tejas, Akash surface to air missile and other systems in significant numbers. One hopes MBT Arjun will also join this distinguished list in greater numbers. These are very glad tidings to the managers of the defence system in the country, Indian industry as well as the Indian tax payers. It is now a matter of record that practically most of the flagship programmes taken up for indigenous development during 1980 – 1990 by DRDO in collaboration with Defence PSUs and Ordnance factories – LCA, tactical guided missiles, pilotless target aircraft, surveillance UAV, MBT, multi-barrel rocket launcher and a host of radars, sonars and EW equipment – have been accepted as technical successes after due trials. However there have been heavy delays in their completion providing ample reasons for users to look elsewhere for filling “urgent operational voids”. Although costs of the indigenous systems in manufacture are significantly higher than that forecast initially, they still remain mostly competitive with comparable foreign product. Users have reservations on the quality and timeliness of the product support provided for the indigenous systems; surely that is an aspect which can be improved to desired levels – given the rich experience of the Indian defence system in coping with the disastrous consequences of the collapse of Soviet Union and the disappearance of guarantees and life cycle support along with it.

Users have reservations on the quality and timeliness of the product support provided for the indigenous systems; surely that is an aspect which can be improved to desired levels.

It is certainly not a poor record of performance for the first generation of indigenous systems. However, the sheer volume and value of Indian defence demand is huge enough to render the indigenous systems a minority in the inventory. In order to be able to make a dent and set a target of say 50% self reliance by 2015, the entire process starting with requirements generation through the process of development and manufacture to operations and maintenance needs to be reviewed. Some suggestions are offered in succeeding paragraphs.

Requirements Generation

A successful defence posture emerges only where there is a convergence of 3 Ts - Threat perceptions, Tactics and Technology application.

Technology wins wars. Global experience over several decades also tells us that technology, inappropriately applied, also loses wars.⁹ Trouble with technology (rather the high technology system) is that it demands deep understanding of its capabilities, limitations and impact of operational environment in order to achieve the desired end objective. It is also a problem with high technology that transplants do not survive and prosper except in very carefully designed and congenial environment. A successful defence posture emerges only where there is a convergence

of 3 Ts - Threat perceptions, Tactics and Technology application. A realistic requirement generation process must necessarily be driven and dominated by “demand – pull” rather than by “technology – push” approach. Unlike mobile telephones and refrigerators, indigenous defence systems cannot be manufactured and sold in various technology flavours allowing the market to choose what is affordable. Optimising the process of requirements generation is by no means an easy or trivial task.

Requirements generation process starts with validated assumptions on strategic requirements arising from threat perceptions and national policies to contain them. The average Indian citizen following broad developments in the defence sector is justifiably puzzled and somewhat skeptical of capability acquisition in progress. There is a serious disconnect between appearance and reality where national security perceptions among citizens are concerned.

Looking at external aggression, we have enjoyed nearly four decades of peace and tranquility. There is nothing in the strategic analysis published to suggest that this tranquility is about to be disturbed in the coming decade. So the nation can and must plan for the long term as far as serious external aggression is concerned – without falling in to “emergency acquisitions” traps. Deep studies on national strategic posture options, security threat perceptions and optimum / affordable responses are essential inputs to such long term acquisition planning. Modeling studies and simulation are essential decision support tools for such planning.

Opting for force multipliers, such as precision guided munitions or UAVs, must be accompanied by logical reduction of conventional resources (dumb weapons, manned aircraft for surveillance). If UCAVs are the future, role of manned fighters after the next couple of decades has to be reviewed. These are, undoubtedly, complex and difficult decisions; but that is the stuff of higher defence planning and cannot be short circuited except at great national cost. If acquisition projects of high value defence systems presently in progress have emerged from such studies, then sharing of the logic and analysis behind these decisions (not just acquisition values and years) with the Parliament will go a long way in removing skepticism among the citizens. If not, such studies of policies and options must be put in place without further delay.

Simultaneously with the tranquility at the borders, the nation is passing through extra-ordinarily troubled times on account of low intensity conflicts, proxy war waged by irregulars across the border in J&K, violent acts of terrorism arising from religious fanaticism all over the country, insurgencies based on political ideologies in several regions as well as general anarchy attributable to diminished respect for rule of law. We must also assume that some of these internal disturbances have covert support from outside. The strategic depth advantage of India does not seem to matter at all in this respect. These “internal” disturbances leave the citizens with an awful sense of insecurity. It is this threat perception which needs to be addressed on priority. The citizen has a right to expect that the capability and systems acquisitions which are being made in the national security sector (not “defence” alone) are correctly prioritized and indeed address the right threats.

The citizen has a right to expect that the capability and systems acquisitions which are being made in the national security sector (not “defence” alone) are correctly prioritized and indeed address the right threats.

There are plenty of valid reasons to manage internal disturbances and external threats separately from the point of view of the lethality of weapons deployed, extent of force applied etc. However, there are no good reasons to view the acquisition of non-lethal technology capabilities such as communications, night vision devices, reconnaissance and surveillance sensors, mobility systems etc separately in an uncoordinated manner for the two segments of national security. It is interesting to speculate whether Indian defence forces are trained and equipped for interoperability of operations with the para military and the police while they are being trained for interoperability with foreign forces in international peace keeping operations. Incidentally, standardisation of equipment and procedures needed for such “internal interoperability” will be greatly facilitated by the preferred use of indigenous systems in both segments. Indian DIB should be greatly energized by developments in this sector.

Delays in Development and Manufacturing Programmes

The major problem with indigenous development so far has been the inability to adhere to projected time schedules. Experience over the last two decades shows that while an impressive majority (over 80%) of the indigenous development projects has succeeded technically, practically none of them could be completed in time. Schedule slippages of several years have been the rule and not exception. Clearly such delays in indigenous development projects which are their self-destruct mechanisms must be minimized if not eliminated if the future of self reliance in Indian defence has to be different

A joint study by all stake holders in Indian defence acquisition process is urgently needed to identify problems in time management aided by specific case studies and to suggest measures to avoid delays in future.

Curiously, a similar analysis of defence systems imports not involving any development content shows equally (or even more) unacceptable time delays. Programmes of major weapons system upgrades entrusted to experienced foreign vendors (in order to avoid delays which indigenous development might entail) have arrived very late. It would therefore be prudent to analyse the root causes of such delays without prejudice or pre-formed opinions with the sole objective of setting things right in this crucial aspect of time keeping. A joint study by all stake holders in Indian defence acquisition process is urgently needed to identify problems in time management aided by specific case studies and to suggest measures to avoid delays in future.

Test and Evaluation

T&E must follow a carefully constructed doctrine which must objectively meet the aims of the acquisition action that has been set in motion. Development T&E (DT&E) and Operational T&E (OT&E) have different end goals. However, OT&E and DT&E must make full use of data generated in DT&E stages and avoid wasting resources and time. Other major defence systems in the world seem to have paid a great deal of attention to this aspect of making T&E more objective and efficient. T&E is considered to be the conscience of acquisition¹⁰.

Certainly comprehensive testing at development and pre-induction stages will reduce failures and equipment down time in operation. At the same time, it is not wise to spend years / summers and winters in what are known as field trials, troop trials and confirmatory trials disproportionate to the benefits arising. There is insufficient correlation between such "exhaustive" field testing of development prototypes and reliable performance of the manufactured systems in operational usage. Presently a lot of analysis, simulation and laboratory evaluation / accelerated

testing techniques are available to enable us to minimize T&E time and costs. Use of these techniques will make the overall acquisition process more efficient.

Hard and Soft Options

Offsets (direct and indirect) in defence procurements might appear to provide some advantages when imports are unavoidable; they are not arguments in favour of opting for imports considering the global experience with defence offsets and their costs, limitations and ill effects on the national DIB.

Indigenous design and development route is undoubtedly the difficult choice. It demands making total system changes and will not be greatly improved by tinkering with only the development or manufacturing sectors. Evolving specifications, design, development, test, evaluation, transfer of technology to production, manufacture, operation and maintenance is an inevitably long chain. The chain is as strong as its weakest link. Therefore a total system approach will have to be taken to effect improvements meticulously at the detailed level – and not hope to achieve miracles merely by associating alternate agencies from private or public sectors. This is the hard option.


Softer options may be considered exceptionally. Transfer of manufacturing technology from foreign vendors under license (“Buy and Make”) is a half measure and is likely to prove a sterile route in most cases - not capable of creating design and development capabilities for systems or for even upgrades in the future. Offsets (direct and indirect)

in defence procurements might appear to provide some advantages when imports are unavoidable; they are not arguments in favour of opting for imports considering the global experience with defence offsets and their costs, limitations and ill effects on the national DIB.

Conclusion

Present state of excessive dependence on imports for defence systems is economically, strategically or politically unaffordable. It is not unavoidable considering the demonstrated strengths of the Indian Defence Industrial Base. There is a strong case for factoring in the impact of defence acquisitions on national economy, industrial capabilities and employment generation. Indigenous systems cannot be promoted without firm conviction on its rationale and advantages. Major systemic changes

Major systemic changes will have to be effected in the process of requirements generation, development and manufacturing, test and evaluation in order to make progress towards greater self reliance.

will have to be effected in the process of requirements generation, development and manufacturing, test and evaluation in order to make progress towards greater self reliance. Some suggestions in this regard have been made. The process should begin with an articulation of a Self Reliance doctrine with adequate attention to details of implementation and time schedules. 

Notes:

- 1 "In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex. The potential for the disastrous rise of misplaced power exists and will persist." Public papers of the Presidents, Dwight D. Eisenhower, 1960, p.1035-040
- 2 The globalization of arms production and trade: Implications for the UK economy, John Dunne, London School of Economics, November 1999
- 3 Defence Minister AK Antony said "it was unfortunate and painful that 70% of defence equipment was still being imported" and informed Lok Sabha that Government was working towards manufacturing state-of-the-art equipment indigenously."- Press trust of India, New Delhi, July 20, 2009
- 4 "India's arms import doubles in five years – set to topple China as world's largest importer" – Infodrive India citing SIPRI report for 2009
- 5 "Are India's defence acquisitions in a mess?", Brahma Chellaney, The Economic Times, July 31, 2009
- 6 <http://www.indianexpress.com/newe/drdo-revamp-antony-appoints-highlevel-panel/475162/>
- 7 "...long and continued dependence on imported weapons brings serious military and political dangers. In the first place, it may not prove possible to obtain the latest weapons from abroad except at the price of accepting military or political obligations, which might give rise to a risk of India being drawn against her will into conflicts not directly concerning her. Secondly even if no such obligations were accepted initially, the possibility that political pressure be exercised on India by withholding deliveries of weapons or spares must clearly be faced ..", PMS Blakett Report to Indian Prime Minister, September 1948. See also "India's ad hoc arsenal" – Chris Smith, Oxford University Press, 1994.
- 8 Prime Minister Manmohan Singh speaking on the occasion of the 75th anniversary of Dandi March, Times News Network, October 3, 2005
- 9 See Superiority, Arthur C Clarke, for a science fiction account of how superiority in technology leads to defeat in war, SF &F Magazine, August 1951.
- 10 See for example <https://acc.dau.mil/GetAttachment.aspx?id=24644&pname=file&aid=2907&lang=en-US> for a description of the role assigned to T&E in acquisition policy and procedures in US DOD