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The First and The Only ISO 9001:2008 Certified Defence and Security Magazine in India

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DSA

THE ONLY MAGAZINE AVAILABLE ON THE INTRANETS OF IAF, CISF AND BSF

MAKE IN INDIA IN DEFENCE

MAKING INDIA SELF-RELIANT

DSA™

MISSION

The power of a King lies in his mighty arms ...

Security of the citizens at peacetime is very important because State is the only saviour of the men and women who get affected only because of the negligence of the State.

— Chanakya

DSA is as much yours, as it is ours!

There is a seamless link between all the most sophisticated battle ships, combat aircraft, advanced tanks and other heavy equipment used by the army. That seamless link is intrinsically connected to India's quest for industrial growth, economic opportunities and fulfilling the aspirations of many in the job market. It is something with which India is well versed and which could provide an even brighter future for India's economic growth. And its national security. In a nutshell that seamless link is software, with which many in India seem to have developed an innate ability. The connection goes something like this.

All of the most advanced military hardware nowadays is increasingly dependent on greater advances in software. The most stealthy ship or aircraft is only as good as its software. And the most powerful tank is as lethal as its software's ability to handle the gun and fire control systems. Not to forget its mobility too. Software is something India has developed into an inbuilt ability, no pun intended. Thousands of young software engineers and programmers perform millions of algorithms to produce world-class computing abilities. All of which is also in major demand in the world's military industrial complex.

Now imagine the thousands of Indian software engineers plugging away at their modems and keyboards, writing and rewriting advanced combat capable programmes from their work stations in India. Now imagine the economic and military consequences of those actions. Firstly, by the sheer fact that those thousands of software engineers were gainfully employed within India. And secondly by the fact that their output, in terms of sophisticated software products, could well change the way India makes combat equipment and fights its wars. Future of combat is sophisticated software guiding advanced hardware into battle. That software capability exists in India and it is now a question of giving an opportunity to the other portion.

For India to be secure it needs to make and own the software that drive its advanced weapons systems, land, sea or air. Wherever the hardware be sourced the final performance is determined by the software, the avionics eg that deliver the punch. Which is why it is well-nigh time now for India to begin the process of making in India for the defence sector. It is only when India makes its own will it ever be safe and secure. Dependence on imports creates its own and another cycle of dependence, from which India has yet to extricate itself. And then its also a question of industry and opportunities.

Scores of bright young Indians leave the country every year because they don't get a chance to participate in research and development. Scientists and engineers find R&D the most exciting part of their job. But the scope in this direction is limited, as our opportunities. There are still others who leave the country because they want to mix R&D with business opportunities. For which the scope is further limited. It doesn't have to be so in permanence.

The opportunity to make in India for defence is yet not attractive enough for researchers and investors because of various protocols and missing links. Once that bit is taken care of, the sky is literally the limit for defence sector manufacturing in India. It is for the Government of India to give space to industry so as to enable it to enter the defence manufacturing sector. Simply transfer of technology is not enough and is not what the country needs in the long run. What is needed is a dynamic R&D base, vibrant manufacturing side and a competitive edge that also allows India to export some of its defence products.

Defence public sector units are limited in their scope and ability to deliver. It is now that the private sector should be encouraged to enter the game, whilst playing on a level playing field. Employment, after all, is the key to a bright future for India. In this case security needs are being met, while employment opportunities are also going to be on the rise. Any sector that can absorb thousands of bright young Indians and at the same time address the country's security concerns, is a field that must be encouraged and promoted. Which is why the time is ripe for a make in India for defence campaign.

Manvendra Singh

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MAKING INDIA SELF-RELIANT IN DEFENCE

Let us trail back to 1950s, when the then Prime Minister of India made announcements for industrialisation in all the sectors. The avowed intention was a rapid growth of the country. As with every other sector in the interactions and spinoffs that they entail, Defence too plays an integral role in the industrialisation and growth of a nation state. The invasion of Jammu and Kashmir by Pakistan immediately after partition underscored the reality of our vulnerabilities. But it was the Chinese aggression of 1962 in the high Himalayas that drove the leadership to give due importance to the multifarious requirements of the Indian armed forces.

It had become very apparent that Defence production had to keep pace with growth in other sectors of the economy to ensure that war was not thrust upon the nation without adverse fallout on the aggressor. Hence the establishment of Defence Research and Development Organisation, the Ordnance Factory Board and the many Defence Public Sector Undertakings were assigned specific tasks to produce specific military wherewithal required by the armed forces of the nation.

The creation of the Indian Space Research Organisation and Bhabha Atomic Research Centre were the emanations of visionary leaders. Both have contributed immensely to the Indian doctrine of minimum nuclear deterrence which has become a cornerstone of national defence and security. The Chinese aggression of 1962 nudged and provoked our leaders with the grim realities of the defence production sector's inadequacy to ensure inviolability of territorial integrity of the nation.

Foreign governments and arms manufactures used the Kashmir issue to manipulate security environment to exacerbate tensions between India and Pakistan by pumping latest weaponry into the Pakistani arsenal. India was forced to try and keep pace and procure weapons from wherever it could. The former Soviet Union proved to be a good friend and was generous in permitting licensed production of latest equipment. But this arrangement, bereft of a matching indigenisation effort, led to an overdependence on foreign sources of military supplies to the extent of seventy per cent of the total holdings.

The promise of 'leapfrogging' foreign technology and creating indigenous weapon platforms has foundered on the rocks of a mismatch between the engines and chassis of two of India's most prestigious defence projects for the creation of light combat aircraft and the indigenous main battle tank. Dependence on foreign engines in two of its most important strike platforms has compelled India to remain dependent on foreign sources for the most important component of a weapons platform, the engine. Whether this state of affairs is the result of a deep-laid conspiracy … is a matter for scrutiny!

We have seen a rapid growth in the past five decades in almost every sector in India like automobiles, telecommunications, health etc but any major transformation in the defence and security industry is still elusive. This is a shocking realisation for a country like India which ironically has an alarming internal and external security environment.

This is not the time to discuss deficiencies of our system! India urgently needs best possible solutions to overcome these shortfalls which instantaneously demand a tenacious road map and I believe, that the announcement of 'Make In India' campaign by our Hon'ble Prime Minister Modi is a commendable move from the government. The responsibility of making this initiative a roaring success lies on the shoulders of all stakeholders … Indian and global.

This edition of ***DSA*** shares candid and unflinching ruminations of senior leaders of Indian and global defence companies and endeavours to create a bridge between the stakeholders to develop Indian Defence Industrial Base without further delay.

Jai Hind!

Pawan Agrawal

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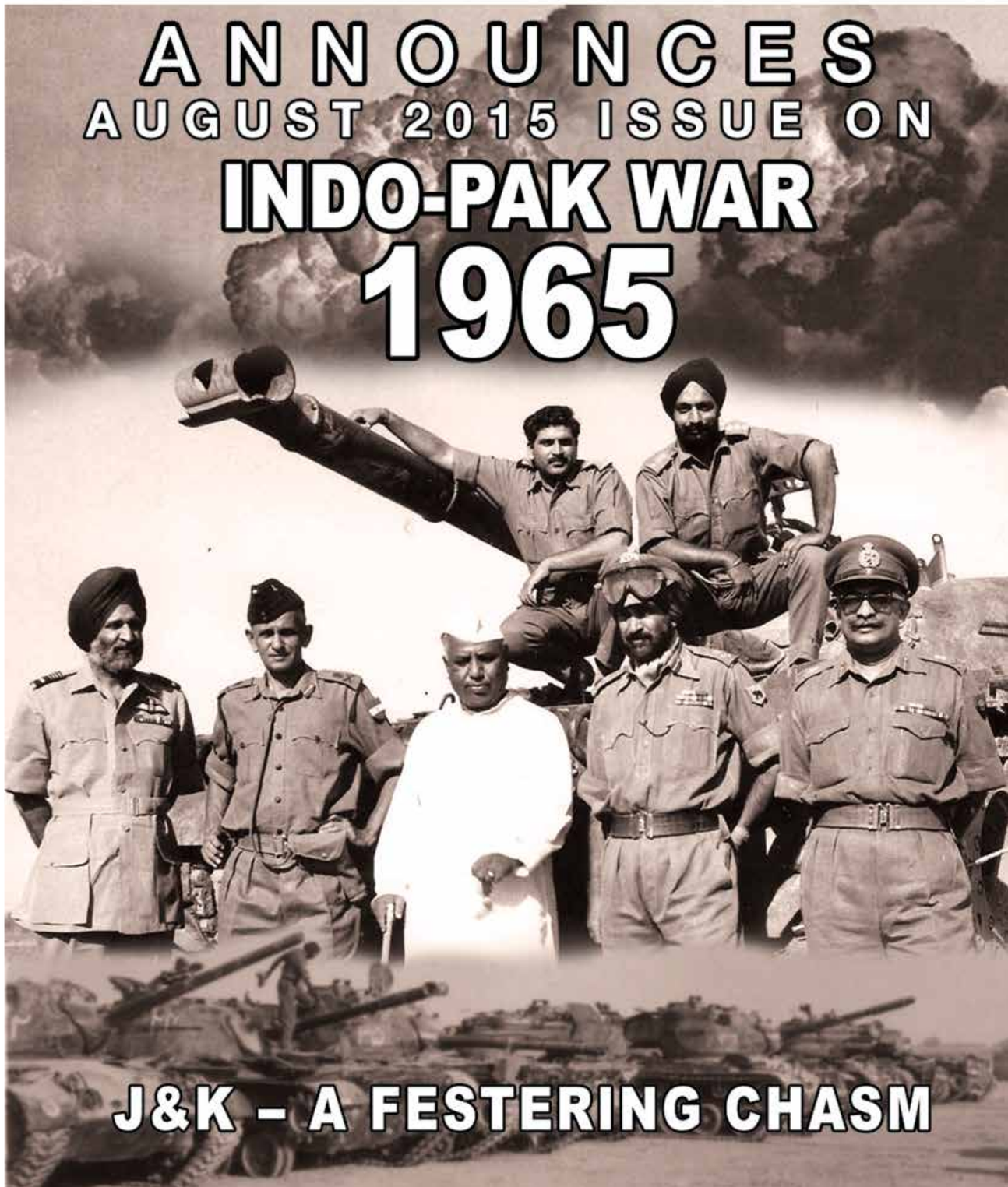

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EXCLUSIVE INTERVIEW

WITH DEPUTY CHIEF OF ARMY STAFF

LT GEN CA KRISHNAN UYSM, AVSM

Lieutenant General CA Krishnan is an alumni of the National Defence Academy, Khadakwasla. He was commissioned into the 3rd Battalion the 4th Gorkha Rifles (Chindits) on June 13, 1976. During his long service career, he has held a variety of command, staff and instructional assignments at all levels in the Indian Army and has attended various courses of instructions that include, Defence Services Staff Course, Higher Command and National Defence College. The senior staff appointments held by him include Brigadier General Staff in Defence Services Staff College, Wellington and Director General (Manpower Planning & Personnel Services) in Adjutant General's Branch, Integrated Headquarters of MoD (Army). His instructional appointments include tenures as Instructor at the Indian Military Academy at Dehradun and as Directing Staff at Defence Services Staff College, Wellington. His command assignments include 3/4 Gorkha Rifles (Chindits) on the line of control in Jammu and Kashmir, an Infantry Brigade in Jammu and Kashmir, Inspector General Assam Rifles (South) in the state of Manipur and General Officer Commanding a Corps in the Eastern Theatre. He is the Colonel of the Fourth Gorkha Rifles. He has taken over as the Deputy Chief of Army Staff (Planning and Sytems) on May 1, 2014. Here is an exclusive interview Gen Krishnan expounds his views on 'Make in India' concept and how it will impact the Indian Army.

Defence and Security Alert: **Conceptually, how is 'Make in India' different from the 'Make' procedure introduced by MoD in 2006? What new measures have been taken by MoD to promote 'Make in India' in Defence since the Prime Minister gave this call on 15th August last year?**

Deputy Chief Of Army Staff: There is a clear and distinct difference between **'Make in India'** and **'Make'** procedure. **'Make'** is one of the categories specified in the various versions of DPP and all cases under the 'Make' procedure follow a well defined process. The procedure is applicable to 'complex hi-tech' systems and deals with the entire process of design, development and manufacture through Integrated Project Management Teams in conjunction with designated DPSU or private industry. The emphasis is to produce indigenous systems with the government financially supporting the realisation of the prototype upto 80 per cent of the cost. The 'Make' procedure is currently under revision to align itself to the environmental realities of the Indian defence industry landscape and is likely to be promulgated soon.

'Make in India' initiative goes well beyond the DPP and is a focused approach towards encouraging manufacture of defence and other equipment in India. It is an overarching concept which in spirit applies to all categories of the DPP and encourages seeking AoNs under the **Buy (Indian), Buy** and **Make (Indian)** and **'Make'** category. It has been the Army's endeavour in the last few years to categorise **maximum proposals for acquisition** for Indian Army as either **Buy (Indian), Buy and Make (Indian) or Make** so that **impetus is provided to manufacturing within the country**. ***Even in G2G procurements, the endeavour is to incorporate the 'Make in India' philosophy to the maximum extent possible.***

DSA: **It was widely expected that a few 'Make in India' projects will be identified by each Service and the industry would be invited to participate in those projects. Is there any plan to do that? If so, how soon can this be expected? Will these projects be executed under a special procedure, different from the 'Make in India' procedure that was introduced by MoD in 2006?**

DCOAS: As clarified earlier 'Make in India' is an overarching concept which is applicable to all defence procurements which includes Buy (Indian), Buy and Make (Indian) and Make categories.

The Army has **identified a number of projects in terms of weapons and equipment** in Technology Requirement for **next 10 to 15 years** which have been **shared with the Indian industry** in the Technology Perspective and Capability Roadmap available on **Ministry of Defence website**.

The Government's **efforts at indigenisation** of defence and ancillary industries through the 'Make in India' initiative have **evoked great enthusiasm**. The existing procurement procedure as outlined in the Defence Procurement Procedure (DPP) manual 2013, is under review. **Inputs for the said review have been given by the Services**. The **new DPP will be released by MoD after incorporating these issues**. The DPP is also being simplified.

The Indian Army has been a strong proponent of the 'Make in India' initiative. In the last one year bulk of the new AoNs have been aligned to the 'Make in India' philosophy and have been categorised as either Buy (Indian) or Buy and Make (Indian).

The **'MAKE'** category of the Defence Procurement Procedure **is being simplified** in such a manner that it **will enable indigenous design and development of weapon platforms and equipment** by both public and private industry in a **faster time frame**. The attempt is to create an **ecosystem conducive to strengthening the indigenous capabilities** in design and development, manufacture and maintenance of weapon systems and other defence equipment.

The Services understand that participation of **private defence industry is vital** for **'Make in India'** process from the **conceptualisation of projects** itself. The Army has therefore established **procedures for enhancing interaction with the industry.** The **private industry is invited for making presentations** on available equipment **as also to conduct demonstrations,** whenever required.

Lt Gen CA Krishnan, DCOAS with Pawan Agrawal, Publisher and CEO of *DSA* magazine

DSA: **Procedural complexities are believed to be one of the main reasons why the defence procurement gets delayed or stalled. What needs to be done to improve and streamline the procedure? Have budgetary constraints affected the modernisation programme of the armed forces and impacted defence preparedness? What do you think needs to be done by the government to make higher budgetary allocation to the armed forces?**

DCOAS: The procurement procedure for the Armed Forces is spelt out in the Defence Procurement Procedure 2013 which is a well designed and carefully drafted document. It aims to ensure **probity, a level playing field** and **speedy procurement**. The major challenge is to balance these three requirements. The Defence Procurement Procedure came into being in 1992 and has been revised seven times and is currently being further reviewed by a panel of procurement experts. This is a clear indication that procedures are being constantly reviewed and revised to align with the ever-changing environmental realities.

While procedural complexities do exist, they are inevitable in any procurement process that has very large financial outlays. Although the Defence Procurement Procedure includes detailed procedures for intervention of the DAC where deviations are required, such interventions are kept to the barest minimum as these entail detailed deliberations which take considerable time. One way to expedite the process is to constitute empowered committees to examine problems at any stage during the actual procurement and resolve these through speedy decisions.

The pace of modernisation is directly proportional to the pace of approval of new schemes, completion of mandatory steps of the defence procurement procedure, completion of trials/evaluations, contract negotiations and availability of budgetary support. The process of allocation of budget for new schemes has some inherent flexibility based on the progress of ongoing procurement schemes. Allocation made at the BE stage can be augmented by additional allocations at later stages based on progress of the schemes.

DSA: **Indian Army has been ailing from various critical deficiencies – obsolete weapons, lack of ammunition and spare parts and excruciating acquisition delay seriously compromising the combat readiness of the force. What are the expectations of the Army from 'Make in India' campaign and hyperactive Defence Acquisition Council?**

DCOAS The Army has a well thought out perspective plan in place which addresses the issues of modernisation and capability building. While there are slippages, the Army's modernisation is taking place steadily. The aim is to firmly embark upon the path of self-reliance.

The Indian Army has **certain genuine expectations** from the industry. We regard the industry as a **vital stakeholder** and **key enabler** in the national **security paradigm**. The industry needs to **play** a far **greater role in capacity building** for **meeting the challenges to our security.** A greater degree of **Research and Development efforts by** private defence industry along with indigenous manufacturing capability to **enable self-sufficiency and cost-effectiveness is a must**. The Indian industry must also explore the possibility of establishing Joint Ventures (JVs) with Defence Industry leaders around the world to manufacture state-of-the-art, quality products in the country. We also expect the **industry** to constantly **upgrade their products in line with world standards while at the same time ensuring that their products are competitive**. The impression we get is that the Indian industry is gearing up well in response to the 'Make in India' initiative.

DSA: **The Future Infantry Combat Vehicle (FICV) was taken up under 'Make' procedure in 2009-10 as the 'First and only Make Category till date'. However the project has made no progress. How does the Indian Army hope to make use of the 'Make in India' initiative to actually fructify the FICV project as well as other major land system requirements of Indian Army?**

DCOAS: It would be incorrect to state that the FICV project is the only Make category project till date. Other procurement schemes categorised as 'Make' include: The Terminal End Secrecy Device (TESD), Tactical Communication System (TCS) and the Battlefield Management System (BMS). All four cases under the Make procedure are at various stages of the process and are now progressing well. Being the first few schemes under the 'Make' category these projects did face some procedural problems earlier on which have now been resolved.

Make cases follow an elaborate process because of the greenfield approach and the complexities in realising a prototype. The FICV project was initiated but required certain mid course correction. As a result, the entire process was reinitiated after realigning the project to the current requirements. The FICV project is progressing well and anticipated timelines are being largely met. Due to this reinitiation of the project, we hope to leverage a much greater degree of indigenisation in accordance with the 'Make in India' concept.

DSA: **Do you think that Government's 'Make in India' initiative in the defence sector will help the Indian Army in overcoming its medium term critical deficiencies or even those identified in the LTIPP considering the FICV precedence? Which major land system programmes are proposed to be categorised in a manner so as to make use of these initiatives?**

DCOAS: The 'Make in India' initiative is aimed at achieving self-reliance and security. It aims to harness all resources towards developing a sound defence industrial base. A strong Military-Industrial Complex coupled with a vibrant technological base would enable us to not only overcome our deficiencies but also to generate net surplus in the system both in terms of technology and capacity.

With the announcement of the 'Make in India' initiative, a large number of **foreign vendors** have shown **keen interest in setting up Joint Ventures** with Indian companies to **manufacture weapon platforms and equipment with latest technology** within the country. It will translate into a win-win situation for the armed forces, the Indian industry and our economy as a whole.

155/52 Calibre Mounted Gun System, the successor to *L70 AD* Gun System etc under the Buy and Make (Indian) category have elicited very good response from the Indian Industry. Tactical Communication System, Battle Management system and FICV (Futuristic Infantry Combat Vehicle) are major 'Make' projects, FRCV (Future Ready Combat Vehicle) is another major project being processed to be taken up under the 'Make' category. You will thus see that the procurements of the Indian Army are being aligned to the 'Make in India' initiative in a big way.

Lt Gen CA Krishnan, DCOAS with Pawan Agrawal, Publisher and CEO and Mamta Jain, Head Corporate Communication, *DSA* magazine

DSA: **The 'Buy Indian' category of the DPP lays down 30 per cent indigenous content in the equipment being considered at all stages of the procurement process including field evaluation trials. How do you expect number of Indian vendors to invest in creation of production facilities (may be including outright purchase of foreign technology) to develop/produce the samples for field trials knowing that even if the procurement materialises, order would be placed on only one of them?**

DCOAS: The DPP lays down a very clear distinction between the 'Buy' and 'Make' categories. While the Buy category relates to products which are mature and readily available and can be absorbed into service with some customisation, the 'Make' category involves *suo motu* development of the product. Thus Buy category would largely relate to equipment which already exists and needs to be merely adapted to our specific requirements. An outright Buy (Global) category requires 30 per cent of the funds to be rechannelised into India as 'offsets'. It is therefore logical that for a Buy (Indian) where the equipment is supplied by an Indian vendor 30 per cent indigenous content is required.

Since a Buy category presupposes prior existence of the equipment, producing it for trials on a No Cost No Commitment (NCNC) basis is not expected to pose any major problems for vendors. As far as only one vendor being awarded the contract in the Buy (Indian) category is concerned, the risk is the same as in any other competitive bidding process.

DSA: **Recently the Vice Chief of Army Staff, Lieutenant General Philip Campose emphasised the need for a 'Synergised approach' to ensure the success of the 'Make in India' initiative in the defence sector. What steps are being taken to achieve such 'Synergy' between various stakeholders?**

DCOAS: The 'Make in India' initiative requires constant and iterative interactions between various stakeholders at all levels of execution, policy and strategy. The users, DRDO, DPSUs, Acquisition Wing and private industry engaged in defence form the vital components of this synergy. Other stakeholders/facilitators include the finance, the academia etc.

Synergised approach is needed at all levels; within the services, inter services, with DRDO, DPSUs, MoD and with private industry. Various forums for such interactions have been established and a vibrant and meaningful exchange has commenced between various participants. Structured user DRDO interactions and user-DRDO-OFB meetings take place on quarterly basis. **Seminars and meetings with the industry as well as industry associations like CII and FICCI are held regularly to exchange ideas and to understand each other's requirements.** In addition to this interaction is undertaken on need basis and annual defence expositions are organised, where the industry exhibits their capabilities to the armed forces.

All long-term **acquisition plans are formulated by the Services in consultation with various agencies**. **QRs** are formulated **based on operational requirements and responses from industry, DRDO etc.** The requirements are **processed in various collegiate discussions based on available products for which industry provides inputs**. **Procedures and processes are constantly being evaluated and reviewed for improvement.**

SURAKSHA MANTHAN

A Conclave on Defence and Security of India
28th-29th September 2015, New Delhi

Suraksha

Su+Raksha means a very well organised system for Defence, Security and Safety. Our commitment to defence and security goes beyond the confines of the meaning to identify and establish mechanisms that strengthen national security along with metamorphosing every Indian citizen with a renewed sense and awareness of *Su+Raksha* – a very well designed and organised *Suraksha.*

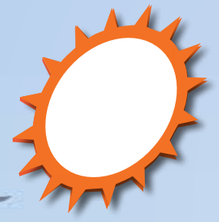
Manthan

Manthan has been derived from the mythological *Samudra Manthan* where the Ocean was churned by gods and demons in pursuit of Nectar for Immortality. Intellectual powers from defence and security fraternity brainstorm with stakeholders from the industry and policy makers to design a road map for the impregnability of India's National Security.

VISION

The Colours

Saffron, White and Green rings have been taken from the colours of the Indian National Flag to emphasise the objective of *Suraksha Manthan* for making INDIA self-reliant in Defence and Security. The rings symbolise that *Suraksha Manthan* is going to be an analogous continuation of our commitment to National Security.



The Chakra (Spinning Disc Weapon)

Inspired by *Sudarshan Chakra*, the most powerful weapon that was commanded by the mind of Lord Vishnu to whisk off within nano-seconds to annihilate the enemy and return on his fingertip. *Sudarshan Chakra* will inspire Indians to develop technologies that will soon empower weapons that will be commanded by mind in a similar manner to annihilate inimical forces for India's National Security.

The Brain

Human Brain has been used to signify brainstorming *(Manthan)* to generate new ideas and solutions and create a road map for India's National Security.

The Whirlpool

Symbolises a churning of the mighty ocean by gods and demons in pursuit of Nectar for Immortality. Here we have co-related this churning to brainstorming of thoughts by the stakeholders to design a road map for India's National Security.

DSA

Suraksha Manthan is an initiative of ***Defence and Security Alert (DSA)*** magazine.

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A CLARION CALL
LET'S MAKE IN INDIA

To ensure the success of the Prime Minister's thrust, the Indian government will have to make a drastic departure from many of its earlier *modus operandi*. Importantly, Indian bureaucracy will have to undergo an attitudinal change, shrug off its traditional sluggishness and promote an ease of doing business in India environment.

The security potential and capability of a nation, unquestionably, is the most fundamental and a defining constituent of its Comprehensive National Power (CNP). It will be stating the obvious that to ensure the desired modicum of security for a nation, self-sufficiency in the wherewithal and instruments essential for the application of combat power, in the pursuit of national interests, is *sine qua non*.

India, notwithstanding having confronted, since its independence in 1947, five wars, faced severe externally abetted terrorism, home bred insurgencies and despite fielding the third largest Armed Forces in the world remains woefully inadequate in critical self-sufficiency and indigenisation of its arsenal. Since the last 10 years or so, India has achieved the dubious distinction of being the world's largest importer of arms and equipment for its Armed Forces. This heavy reliance on more than 70 per cent of its modern weaponry to be imported is a grave security lacunae especially when India faces a two and a half front challenge – China and Pakistan, in collusion or individually and also likely to be supplemented by internal security threats.

Combat capabilities take painfully long to accomplish and thus self-sufficiency in a nation's critical requirements achieved through manufacture at home remains the best solution for more than one reason. Despite efforts, both sincere and some half-hearted of many successive governments, the goal of self-sufficiency in indigenisation of India's military arsenal remains elusive.

Mission: 'Make in India'

Armed with an overwhelmingly powerful mandate in India's General Elections last year with the capability and will to override any or all objections to manufacturing programmes within the country, Prime Minister Narendra Modi, in September 2014 gave a clarion call, both to the industry at home and abroad to 'Make in India' in all the myriad avenues of manufacture including in the vital defence sector. This appeal and a well-conceived mission has come not a moment too soon but requires to be followed up by energetic and concrete action and an industry-friendly approach by the Government of India. This welcome step must not meet the fate of similar initiatives in the past. 'Make in India' must ascend to a sacred national mission and not degenerate into a mere political advertisement.

'Make in India' aims to attract the best of foreign expertise, in all fields of manufacturing – from state-of-the art cutting edge of technology to even high consumer demand low technology end items to be manufactured in India. It is designed to encourage foreign companies to come and set-up industry in India, facilitate investment and foster innovation, enhance skill development and build world-class infrastructure in India. The mission is to increase share of manufacturing from the current low-level of 15 per cent of the Gross Domestic Product (GDP) to 25 per cent. If this thrust succeeds, it is considered that nearly 10 million jobs in diverse fields of manufacturing will automatically get created. The 'heart' of 'Make in India' initiative is supposedly the defence sector.

Causes Of Malaise

Accretion in India's manufacturing capabilities, sadly neglected so far, is wholly dependent on the creation and sustaining of a sound industrial base. Among the many causes that have bedevilled the growth of indigenous defence industry in India, among the foremost has been that successive governments have failed to synergise the lethargic bureaucratic public sector with the otherwise technologically well-advanced and dynamic private sector. The defence sector in manufacturing, by any standards, thanks to the sluggish DRDO and the defence Public Sector Undertakings have hardly delivered except in some areas like missile systems, small arms and their ammunition, B vehicles, the MBT *Arjun*, LCA *Tejas*, *Dhruv* choppers … though certain subsystems in even these have been imported. Our defence manufacturing essentially has been manufacture under license with the transfer of technology where some defence PSUs have done a fair job.

Importantly, despite many holy pronouncements, no government has given any concrete encouragement to the otherwise frequently announced public–private-partnerships (PPP) to enhance defence production.

It needs to be recalled that defence manufacturing came out of the clutches of the Ordnance Factories monopoly with major liberalisation effected in 2001 with 100 per cent private sector participation, named the Defence Procurement Policy (DPP), this initiative, commencing 2001, also encompassed, apart from private participation, permitting foreign direct investment (FDI) up to 26 per cent subject to licensing and security clearances. However, the cap of FDI to a mere 26 per cent deterred the inflow of FDI. Most Original Equipment Manufacturers (OEMs) were not keen to invest heavily and share their critical, at times under-the-wraps technologies in joint ventures (JVs) with Indian partners with a meagre stake and no significant control over intellectual property, exports, purchase guarantees and a perceived unfair advantage to the public sector producing similar equipment. Thus DPP 2001 proved to be a dismal failure.

Hesitant OEMs

To give fillip to self-reliance in design, development and production of defence equipment, weapon systems and platforms, the previous UPA 2 government unfolded an ambitious initiative dubbed the DPP 2011. This programme was designed to synergise the participation of the private sector in a major way with defence PSUs and develop modern equipment as per a long-term perspective plan prepared by the Integrated Defence Staff and approved by the government. A welcome thrust in this policy was to enhance the potential of small and medium enterprises for indigenisation and broadening the base for defence research. It, however, allowed critically required and otherwise cost-effective subsystems for weapons to be imported. This policy was also clubbed with the Offsets Policy 2012 which endeavours to leverage India's big ticket arms acquisitions to get into the nation state-of-the-art technology and foster long-term tie-ups with the OEMs. This policy, though well formulated, did not display the desired levels expected in indigenous defence manufacturing and the Self-reliance Index continued to hover around 30-35 per cent.

FDI Policy

The OEMs for establishing their factories in India in partnership with PSUs/private industry desire a major say in the overall management of their manufacturing units, including freedom of exports subsequently of their finished products and assurance of orders from the Indian military/other security organs. Though the NDA government, in last year's budget hiked the FDI limit from 26 to 49 per cent, renowned global majors do not appear to have been much enthused to bring in their state-of-the-art technology. However some foreign companies are in discussions currently with Indian defence majors like the Tata, L&T, Mahindra and some of our defence PSUs.

Defence R&D

An area of concern and thus rectification in our future defence planning is that as a percentage of GDP, the defence budget has dropped from 1.81 per cent in 2014-15 to 1.75 per cent in 2015-16. As is well-known, many Indian parliamentary committees have recommended the defence budget to be allocated 3 per cent of the GDP for their overall expenditure including critically required modernisation.

Despite all in the nation, both the government and industry, public and private, fully comprehending the vital necessity for intensive effort in research and development, regrettably, only lip service has been paid so far. According to official figures, the overall allocation to R&D in India to the DRDO is a mere 6 per cent of defence expenditure whereas successive parliamentary committees have recommended a minimum of 10 per cent. Even major industrial giants in India hardly spend more than 1 per cent of their turnover on R&D. Technologically

Lt Gen Kamal Davar PVSM, AVSM (Retd)

The writer is a distinguished soldier having served in all theatres of operations in his 41 years of service. Has been Chief of Staff of a Corps HQ in Jammu and Kashmir and then as GOC 11 Corps responsible for the defence of Punjab. He was especially selected by the Government of India to raise the Defence Intelligence Agency after the Kargil War. After retirement he writes and lectures on security issues. He is widely known to passionately espouse the cause of jointness in the Indian Armed Forces. As the first DG, DIA, many intelligence initiatives including abroad were taken by him.

advanced nations the world over spend 2.5 to 3.5 per cent on R&D while India spends only 0.85 per cent.

Financial Health Of India's Economy

Though India's Defence Budget 2015-16 presented by the Modi government fell short of expectations, however, it comes at a time when certain key indicators of India's economy are on the upswing. The Economic Survey 2014-15 indicates that the real GDP is expected to grow between 8.1 per cent to 8.5 per cent in 2015-16 from 7.4 per cent in the previous fiscal year. This has helped in the lowering of inflation and the huge fiscal deficit India currently has. In addition, the marked decrease in international commodity prices, especially in crude oil imports will assist India's economy to be relatively healthier. However, will the consequent availability of additional funds for defence be also earmarked for 'Make in India' JVs remains to be seen.

Critically Required Weapon Systems

According to most defence analysts in India, the operational preparedness of the three Services in India has fallen to precariously low levels as far as overall force levels, modernisation of equipment, essential war wastage rates of ammunition and other critical wherewithal to fight effectively for a minimum of a 30 days war. The Service Chiefs have also, off and on, sensitised the government on their short-term, midterm and long-term requirements. As the short-term crucial deficiencies and immediate 'wish lists' can come through imports but all concerted efforts must be made for our mid and long-term requirements to be made in India through the 'Make in India' mission mode.

Update: 'Make in India'

Since the launch of the 'Make in India' campaign by PM Modi in September 2014, there has been some movement forward in the defence sector with technologically advanced nations like USA, Germany, France, South Korea, Israel and UK sounding out defence majors in India's private sector and vice versa. At the recent Paris Air Show, Indian company OIS Advanced Technologies has signed two JVs with French firms Rafaut and LH Aviation for manufacture of subsystems for *Rafale* fighter jets which can be used in the *Mirage* and other aircraft. With LH Aviation, production of MALE (medium altitude and long endurance) UAVs will be undertaken. It has also been reported that Mahindra and Mahindra have clinched a multimillion dollar aerospace deal with European consortium Airbus giving a boost to 'The Make in India' programme. The Germans have also evinced keen interest in the production of submarines and other weapon platforms for India. The Swedish Defence Minister on her visit to India the other day has also assured India of the Swedish Defence industry to set-up shop in India. Discussions are currently afoot with vigour among various stakeholders for this campaign.

Shortcomings In Private Sector

However, it also needs mentioning that Indian firms have spurned US$ 15 billion worth of government tenders since 2013 for manufacture of certain weapon systems. Companies indicate their unwillingness to manufacture citing unrealistic and ambitious quality demands in weapons and platforms from the Indian military. They also complain that the Indian Armed Forces desire proven track record in production earlier and importantly, performance standards in equipment as obtaining in technologically advanced nations which they cannot currently meet. Former Secretary Defence Production, MoD, G Mohan Kumar, had stated recently that "We are trying to simplify procedures, create a level playing field but still there are many cases of zero participation in tenders."

Levelling The Playing Field

Meanwhile, in a long awaited and welcome development, the Indian government has scripted, somewhat, a level playing field in defence manufacturing by withdrawing special tax exemptions given earlier to defence PSUs by eliminating excise and customs duty exemptions to them. This step has been welcomed by India's private sector for now the defence PSUs will find it difficult to quote lower bids than the private players for weapon systems and other platforms. India's Commerce and Industry Ministry, in a press release, has stated that renowned defence companies like Boeing, Airbus, Lockheed Martin, BAE Systems and others are 'actively exploring the scope of future investments in India'. It is but natural that they would all be looking to plunge into the expected US$ 620 billion defence market in India for the period 2014-2022 (estimates by the Federation of Indian Chamber of Commerce and Industry) out of which 50 per cent likely will be on capital expenditure.

Ease Of Doing Business In India

At the Bengaluru Air Show in February 2015 which was attended by virtually all global giants of the defence industry and captains of Indian private sector, PM Narendra Modi had forcefully outlined his vision for a vibrant defence industry in India with the synergy of the private and public sector and foreign firms. He had stated that he was confident that "India will emerge as a major global centre for defence industry."

To ensure the success of the Prime Minister's thrust, the Indian government will have to make a drastic departure from many of its earlier *modus operandi*. Importantly, Indian bureaucracy will have to undergo an attitudinal change, shrug off its traditional sluggishness and promote an ease of doing business in India environment. Concerns of the Indian Armed Forces regarding performance and quality parameters, adequate allocations for R&D and subsequently procurement of the finished products will have to be ensured. Standard Operating Procedures with foreign players combining our national with their commercial interests can be worked out suitably and a conducive work and business environment ensured.

As India endeavours for its rightful seat on the global high table, the unqualified success of the 'Make in India' campaign is a critical imperative. Thus, it is incumbent on all stakeholders involved in this national mission to rise to the occasion to ensure its timely fruition. DSA

DENNIS SWANSON
VP, Boeing Defence, Space and Security, India

BOEING

PARTNERING WITH INDIA

Boeing has been working with Indian suppliers in manufacturing, IT and engineering services for over a decade to help meet the Indian Government's objectives to build indigenous aerospace and defence capabilities and position Indian industry for growth in the domestic and global markets.

Today, there are more than 18 suppliers providing parts and assemblies covering commodities such as aero structures, wire harnesses, composites, forgings, avionics mission systems and ground support equipment. Since 2008, Boeing's engagement with suppliers has increased substantially for defence aircraft such as the *P-8*, *F/A-18*, *F-15* and *CH-47 Chinook*. Some of the work our Indian partners are delivering for Boeing is indicative of the complex manufacturing capabilities that Indian companies are capable of developing for the global market. We will continue to invest in partnerships for the long-term in India.

'Make in India' has tremendous potential for the aerospace and defence sector in India, providing opportunities for Indian companies to become a part of the global supply chain and proving to be a catalyst to take the sector to another level.

Boeing is collaborating with companies such as the Tata Group, Hindustan Aeronautics Ltd (HAL), Dynamatic Technologies, Bharat Electronics Ltd (BEL), Rossell Techsys and others in India. These industrial partners and suppliers are already delivering world-class quality, as they become an important part of the company's worldwide supply chain for some of the most advanced aircraft in the world. For example, Dynamatic Technologies and Tata Advanced Materials Limited (TAML) are delivering power and mission equipment cabinets for *P-8I* aircraft and TAML is also on contract to provide *P-8I* auxiliary power unit door fairings. Dynamatic Technologies is on contract to manufacture the aft pylon and cargo ramp assemblies for Boeing's *CH-47F Chinook*. Maini and TAL Manufacturing Solutions are on contract to provide *C-17* ground support equipment.

Hindustan Aeronautics Ltd (HAL) has manufactured the *F/A-18* gun bay doors, *F/A-18* wire harnesses; *P-8I* weapons bay doors, *P-8I* tail cones and *P-8I* identification friend-or-foe transponders. Bharat Electronics Limited (BEL) has delivered the Indian-designed Data Link II communications system for the *P-8I*, the identification friend-or-foe interrogator battle management system and *F/A-18* flight deck cockpit panels.

Boeing has been partnering with Indian industrial suppliers on lean manufacturing techniques, on programme management and supplier management best practices and specialised trainings as part of its drive to bring the best of Boeing to India.

Boeing is also collaborating with Indian companies and institutions to build a skilled aerospace talent pipeline in India. As a recent effort to address the critical and growing need for vocational training and skills development in the Indian aerospace sector, Boeing has partnered with the National Skill Development Corporation India (NSDC) and the Nettur Technical Training Foundation (NTTF). Boeing-funded curriculums and initiatives have already been launched along with relevant aerospace partners such as Rossell Techsys.

On the policy related to offsets, while we welcome the changes made in the defence procurement procedure (DPP), there are certain areas that could be improved. These include the short Period of Perfomance which impacts the ability of companies to identify technologically advanced work; having additional flexibility to leverage the full extent of participation from tier I companies in the policy and making the policy retroactive. DSA

EXCLUSIVE INTERVIEW

WITH DEPUTY CHIEF OF THE AIR STAFF

AIR MARSHAL SBP SINHA AVSM, VM

Air Marshal SBP Sinha graduated from National Defence Academy in June 1979 and was commissioned in the fighter stream on 15 June 1980. He was appointed as the Deputy Chief of the Air Staff on 30 April 2014. He is also the Commodore Commandant of 7 Sqn AF.

He has flown the *Hunter, MiG-21, Mirage-2000* and *Su-30MKI* fighter aircraft and has over 3,700 hours of flying. He is a 'Cat A' Flying Instructor, Instrument Rating Instructor and Examiner and a graduate of the Defence Services Staff College. He has undergone 'Operational Electronic Warfare Course' in France and 'Executive Course on Security Studies' in USA.

He has held various Command, Instructional and staff appointments. His important Command and Instructional appointments include Instructor in Flying Instructors School, Flight Commander of a *Mirage-2000* Squadron, Chief Flying Instructor of Basic Flying Training School, Air Force Examiner in Aircrew Examining Board, Commanding Officer of a *MiG-21* Sqn, Commandant of Electronic Warfare Range, Team Leader of AWACS Project Team in Isreal and Air Officer Commanding of a premier *Su-30MKI* base. He has held the staff appointments of Assistant Chief of the Air Staff (Plans), Principal Director of Plans, C4ISR and Acquisitions and Deputy Director of Operations (Electronic Warfare) at Air Headquarters.

Here is an exclusive interview with *DSA* Air Marshal Sinha shares his views on 'Make in India' campaign and how it can contribute in developing India's Aerospace sector and help in creating jobs.

Defence and Security Alert: **Conceptually, how is 'Make-in-India' different from the 'Make' procedure introduced by MoD in 2006? What new measures have been taken by MoD to promote 'Make in India' in defence since the Prime Minister gave this call on 15th August last year?**

Deputy Chief Of The Air Staff: The 'Make' procedure was introduced in the Defence Procurement Procedure (DPP) 2006 to enable capital acquisitions of High Technology Complex Systems and upgrades for Armed Forces, with an aim to promote indigenous Research, Design, Development and Production capabilities by optimally utilising the potential of Indian Industry. Most schemes under 'Make' category have been undertaken by DRDO as the Development Agency and DPSUs as the Production Agency. On the other hand, the 'Make in India' campaign aims to enhance the indigenous manufacturing capabilities and capacities to meet the requirements of Armed Forces. The 'Make in India' campaign will provide good entry opportunities in the Aerospace Sector to the larger Indian industries and also enable greater participation from a large number of MSMEs. This will help in developing an industrial eco-system to support large scale manufacturing and also strengthen the product support supply chain. In addition, the 'Make in India' campaign will help in creating large number of jobs and providing opportunities for skill development in various segments of Aerospace Sector.

DSA: **It was widely expected that a few 'Make in India' projects will be identified by each Service and the industry would be invited to participate in those projects. Is there any plan to do that? If so, how soon can this be expected? Will these projects be executed under a special procedure, different from the 'Make' procedure that was introduced by MoD in 2006?**

DCAS: All 'Buy (Indian)', 'Buy and Make (Indian)' and 'Make' Projects contribute to the 'Make in India' campaign; therefore, there is no specific need for a special procedure. The need is to encourage the Indian Industry to enter the extremely complex and competitive Aerospace Sector. The major initiatives taken by the Government will help promote the 'Make in India' campaign. A large number of Indian industries are showing great keenness in becoming a part of the 'Make in India' campaign in the Aerospace Sector. IAF has always encouraged development of indigenous defence production capability and capacities. Indigenously developed *Tejas* Light Combat Aircraft, *Dhruv* Advanced Light Helicopter, *Akash* Surface-to-Air Guided Missile, *Indra, Rohini, Ashlesha, Arudhra, Ashwini* radars are some of the major 'Made in India' products. The indigenous *Astra* Air-to-Air missile and a large number of other weapons are at advanced stages of development and trials. In our attempt to strive for larger participation by the Indian industry, we have issued 'Requests For information (RFIs)' for the procurement of Air-to-Ground weapons, Air-to-Air weapons, Surface to Air Guided Weapons, Electronic Warfare Systems and Radars through the 'Buy (Indian)' and 'Buy and Make (Indian)' routes to CII, ASSOCHAM and FICCI. We have received a very positive response from the Industry and we hope to see the Indian Industry's active participation in manufacture of Aerospace products in very near future. The recent approval for manufacture of a modern transport aircraft in India by an Indian Private Sector company by the Defence Acquisition Council has opened the doors for developing an eco-system that will

support indigenous manufacture of high technology transport aircraft in India. Similarly, the approval for manufacture of 200 modern helicopters under the 'Buy and Make' categorisation will help develop an eco-system to support indigenous manufacture of high technology helicopters in India. Aeronautical Development Agency is in the process of finalising a process to involve the Indian Private Sector Industries in a big way in development and manufacture of LCA Mk-II and Advanced Medium Combat Aircraft (AMCA). The process for 'Make in India' campaign has already been initiated and it is matter of a few years before high-tech Aerospace Products start rolling out from Indian industries. These products will have very large indigenous content and we will have an industrial eco-system to support the production line and also provide life-time product support.

DSA: **Procedural complexities are believed to be one of the main reasons why the defence procurements get delayed or stalled. What needs to be done to improve and streamline the procedure? Have budgetary constraints affected the modernisation programme of the armed forces and impacted defence preparedness? What do you think needs to be done by the government to make higher budgetary allocation to the armed forces?**

DCAS: The Government is putting its best efforts to accelerate the Defence procurements. The Government has constituted a 'Committee of Experts' to look into all aspects of the Defence Procurement Procedure and suggest a policy framework to facilitate 'Make in India' in Defence manufacturing. The committee would also suggest requisite amendments in Defence Procurement

Procedure to remove bottlenecks in the procurement process and also simplify/rationalise various aspects of Defence Procurement. Budgetary constraints are not unique to India; in fact, all Armed Forces across the world face budgetary constraints. Based on the budgetary allocations, each Service prioritises its schemes and all schemes are accorded sanction only after confirming the availability of requisite funds. The need for increased allocation has been projected to the Government and the Government has assured maximum allocation within the available resources.

DSA: **Indian Air Force has been operating with truncated air power, ageing and obsolescent aircraft, lack of critical spare parts and excruciating delay in acquisition deals seriously compromising the combat readiness of the force. What are the expectations of the Indian Air Force from 'Make in India' campaign and hyperactive Defence Acquisition Council?**

DCAS: Indian Air Force has a mix of old and new equipment. Ageing of equipment is a natural process, which is dealt through proper maintenance, obsolescence mitigation and mid-life upgrades. Let me assure you, all equipment of Indian Air Force is fully combat ready and the Indian Air Force is always capable of undertaking all its tasks. Numerous measures are being put in place to improve the supply chain and stocking of spares for improving the serviceability and thereby availability of combat assets. We are entering into long-term maintenance contracts to make the spare supply chain more efficient. The Defence Acquisition Council, in the recent past, has cleared many proposals that could not get progressed for a long time for various reasons. It is important to note that most of these proposals cleared by the Defence Acquisition Council are going to provide an impetus to the 'Make in India' campaign, which is a welcome step both for the Nation and the Indian Air Force.

DSA: **The Parliamentary Standing Committee on Defence had expressed concern over the dwindling number of fighter squadrons in the Indian Air Force which has come down to 25 from the sanctioned 42. How do you propose to make up this critical shortfall since the procurement cycles for complex aircraft can take many years, going by the past experience?**

DCAS: Indian Air Force today has 35 fighter squadrons against Government authorised strength of 42 Squadrons. All efforts are being made to accelerate the induction of *Tejas* Light Combat Aircraft and negotiations for the procurement of 36 *Rafale* aircraft from France are already underway. The Government is aware of the drawdown in the numbers of fighter squadrons of Indian Air Force and all possible options are being actively considered to arrest the drawdown.

DSA: **Do you think that Government's 'Make in India' initiative in the defence sector will help the IAF in overcoming its medium-term critical deficiencies or even those identified in the Long Term Integrated Perspective Plan (LTIPP)? How does the IAF propose to be a part this initiative?**

DCAS: The 'Make in India' campaign will help the Indian industry to partner with some of the best international firms and manufacture world-class equipment in India through Joint Ventures, Consortia and Special Purpose Vehicles etc. Such participation by Indian industry will enhance the manufacturing capabilities and capacities of India, which in turn will also have a positive impact on all sectors including Aerospace. In fact, the Indian Air Force has already identified numerous capabilities included in the Long Term Integrated Perspective Plan (LTIPP) to be acquired from the Indian industry through either the 'Buy (Indian)' or the 'Buy and Make (Indian)' route. Further, induction of equipment produced in India will help Indian Air Force overcome deficiencies in the spares support chain as the 'Make in India' campaign will help develop Tier-I, Tier-II and Tier-II sub-vendors to support the production line, as well as provide life-time product support.

DSA: **The *Avro* replacement programme offered the promise of a future private-sector Indian aerospace firm resulting in a big boost for 'Make in India', with enough serious foreign backing and a future alternative/peer competitor for HAL. Unfortunately, Airbus and Tata alliance was the only bidder resulting into a single bid situation. How do you see this programme moving forward?**

DCAS: The offer of Airbus Industries with Tata as the Indian Production Agency was the only offer received resulting into a single bid situation. Other firms did not respond to the 'Request for Proposal' due to very specific reasons associated with each one of them. Notwithstanding the *Avro* replacement programme continues to have the same promise for the Indian Private Sector companies to enter the most complex and competitive Aerospace Sector and provide a big boost to the 'Make in India' campaign. The indigenous manufacture of *C-295* transport aircraft will move forward as conceptualised at the time of defining the project. An Indian Private Sector company will be involved in the production of a modern transport aircraft in India for the first time. The number of aircraft required to be manufactured is likely to increase many times to meet demands of other customers in India and may be a few export orders. This opportunity should be capitalised by Tata to indigenise the aircraft and its components to a large extent, establish an industrial eco-system to support its large scale manufacturing and also provide a robust Maintenance Repair and Overhaul setup to provide life-time product support. After having established the manufacturing of *C-295*, there will be enough opportunities to grow further through civil certification of the aircraft, design and development of other versions of *C-295* or another aircraft. Competition always brings in efficiency and it is good for India to have more than one aircraft manufacturer. The intent of this project was to enhance Indian capabilities and capacities in the Aerospace Sector and not just look for a competitor to HAL.

DSA: **Don't you think that India has lost a great opportunity of acquiring 126 *Rafale* fighters from the 'now dead' MMRCA deal, which would have resulted not only into making up the critical deficiency of fighter squadrons but also into a great boost to the 'Make in India' dream as a result of offsets coming from the deal? What are the lessons learnt from this experience?**

DCAS: The case to procure 126 MMRCA has been under consideration since 2000. The Request for Proposal was issued in August 2007 and Dassault Aviation of France was declared as the L1 bidder on 31 January 2012. The contract negotiations had reached an impasse in 2014 due to non-resolution of certain critical issues. Having appreciated the urgent operational requirements of Indian Air Force, the Government decided to procure 36 *Rafale* aircraft directly from France through a Government to Government Agreement. The procurement of 36 *Rafale* aircraft, rather than being seen as a lost opportunity to acquire 126 *Rafale* aircraft should in fact be seen as an attempt to salvage a procurement stuck for over one and half decade. The 36 *Rafale* aircraft procured through this Agreement will have 50 per cent offsets, which will bring in latest high-end aircraft technology in support of the 'Make in India' campaign. The biggest lesson from this experience is that there is no universal solution to all problems and that there is a need to evolve unique solutions for unique problems. DSA

TURNING VISION INTO REALITY

LOCKHEED MARTIN

The Indian defence sector was opened for the private sector in 2001 but a very small proportion of equipment bought by the MoD comes from the private sector. However, this scenario seems poised for a paradigm shift with the government's 'Make in India' initiative.

Prime Minister Modi has continuously reiterated his government's commitment to 'Make in India' and has stated that he did not want India to remain a net importer of defence equipment and has promised to double the output of defence manufacturing in the country. Defence has been categorised as a major sector for the 'Make in India' campaign and the government is prioritising its goals for this sector in order to ensure that the vision can translate into a reality.

In order to boost the Indian defence industry and provide a fillip to the vision of 'Make in India' some factors are considered critical. Lockheed Martin supports the Government of India's goal of indigenising the defence industry via a strategy of creating more opportunities for local manufacturing, which in turn will reduce dependency on imports and we are actively looking for opportunities to play our part in the process and contribute where we can. This will have a twofold benefit for the exchequer. The outflow of precious foreign exchange will reduce as more defence equipment is manufactured in India. Secondly, as defence manufacturing increases as in all other sectors it will have a positive impact on job creation as well as provide tax revenue to the government.

The 'Make in India' campaign launched by Prime Minister Modi offers opportunity to all of Indian industry to partner with foreign companies looking to establish a presence and capability in the country and generate new employment. There has been welcome relaxation in FDI caps over the last 12 months and we applaud the governments activities to ease doing business in the country. While things don't change overnight and we wouldn't expect them to, there is no doubt that things are moving in the right direction to make a more investment friendly environment.

We have already made an initial investment in manufacturing here in partnership with Tata Advanced Systems in Hyderabad. Within 12 months of our agreement to work together as companies, we were able to erect a facility in a greenfield site and begin producing significant elements of our *C-130J* transporter aircraft. The speed that we were up and running is quite remarkable for anywhere in the world and is an encouragement to companies considering investment in India.

Our joint venture with the Tata group in Hyderabad manufactures large aerostructures for the global supply chain of *C-130J*. The first *C-130J* with an entire tail section manufactured in India flew last year and is now in service with an Air Force overseas. The aerostructures being produced at the Hyderabad facility are now fully integrated into the global supply chain and all *C-130J's* produced will have parts which are 'Made in India'. Lockheed Martin has a 26 per cent share in this JV.

Our experience in India has been extremely favourable in terms of the time taken to establish a plant and get it up and running in the country, things moved very rapidly. Also the quality of work here has been excellent and with the young workforce that we have trained up, we believe that India is a great investment in the future compared to some other parts of the world.

India's potential as a manufacturing hub for the aerospace and defence sector is just being realised. I am confident that as the Government achieves its aim of easing doing business in India and that more companies like us begin to invest and grow here that 'Make in India' can be successful.

In addition to our manufacturing Joint Venture, through our Commercial Training Services, we have supplied full-motion simulators to a training facility in Gurgaon called Flight Simulation Technique Centre (FSTC), where pilots for Airbus *A320* and Boeing *737* aircraft receive certifications and currency training. This training centre last year received its European Aviation Safety Authority type certification, the only centre in India to do so and has attracted overseas as well as Indian pilots from the majority of airlines operating here. So as well as manufacturing aerostructures, we are also making pilots in India, rather than having them travel overseas to complete training like they were doing before.

Lockheed Martin, along with FICCI and the University of Texas IC2 Institute launched the India Innovation Growth Programme in March 2007. It was joined by the Department of Science and Technology, Government of India and the Indo-US S&T Forum in November 2008. The programme aims to accelerate innovative Indian technologies into markets in the United States and around the world. The India Innovation Growth Programme is the only programme of its kind because of its focus on teaching and using world-class commercialisation strategies. Since its introduction in India, the programme has received an overwhelming response from innovators, inventors, scientists and researchers working across diverse sectors throughout India.

The programme aims to enhance the growth and development of India's innovation and entrepreneurial pursuits by launching early stage Indian technologies into the global marketplace. More than 6,000 technology applications have been evaluated throughout the life of the programme. The programme's 'Mind to Market' strategy provides advanced training in technology commercialisation strategies, venture formation, venture finance, technology marketing, competitive technical strategies and presentation skills.

Since its launch in 2007, the programme has helped participants find business partners in India and abroad, resulting in more than 300 business engagement agreements being signed between 2007 and 2014. According to the most recent economic impact assessment conducted by Ernst & Young, the programme helped participants and their companies generate revenues exceeding ₹ 1,500 crore (US$ 236 million) during the period between 2007 and 2012, contributing significantly to the country's economic growth and an early participant in the 'Make in India' initiative.

In addition to this we have funded the development of an Unmanned Air Vehicle technology by Delhi Technological University (DTU), which has been entirely designed and developed by successive students at DTU and will, when ready, be available to take to the market as a product designed and developed in India. We are also now running a university challenge with 5 top-notch universities around the country that are designing and developing mission kits that can be deployed in the *C-130J* here in India or elsewhere in the world where there is a demand.

Lockheed Martin has maintained a presence in India for more than two decades. We have worked to understand the requirements of the Indian government and the security services. Lockheed Martin has many world-class products and looks forward to offering them based on the needs and requirements of India.

One of our key successes is the *C-130J Super Hercules* – the world's most proven airlifter – which is in active service with the Indian Air Force. Lockheed Martin is exploring additional opportunities for this platform in satisfying requirements in all of India's Armed Forces, Security Services and Government Agencies. In addition, Lockheed Martin is offering some outstanding missile systems to India including the precision-strike *AGM-114R* multipurpose *HELLFIRE II*, *DAGR* and *Javelin*. In addition, Lockheed Martin believes an offer of the *MH-60R/S* (Romeo and Sierra) multi-mission maritime helicopters – the most advanced and proven of their kind anywhere in the world – would be a good solution to meet the Indian Navy's requirement for its upcoming Naval Multi Role Helicopter programme. Other products of interest include the *K-MAX*, *E2D* and *Hawkeye*.

Lockheed Martin is actively engaged in several other campaigns for all services. Protecting national security requires not only good arms and equipment but also good tactical communication for situational awareness and coordination. Lockheed Martin has the ability to offer the most effective and efficient equipment to deliver this affordable capability. Border and critical infrastructure surveillance and security is also a strength and we offer a full gamut of capabilities which we would like to offer to India not only for defence and homeland security, but also for areas such as civil aviation and smart cities, where we have a great deal to offer.

PHIL SHAW
Chief Executive, Lockheed Martin, India

Lockheed Martin is not only active in the defence and security arena, but has also applied its skills to developing new technologies in the renewable energy sector, such as waste to energy gasification technology as well as Ocean Thermal Energy Conversion. As these technologies mature, we will also hope to be able to offer those to India to help with the Prime Minister's *Swachh Bharat Abhiyan* and *Ganga* cleaning missions.

Lockheed Martin has established over 350 active partnerships around the globe. Many of these have been in place for over 4 decades and have migrated from programme to programme and among a multitude of customers. The common thread of all of these programmes has been a shared vision of the future in a global economy and a global industrial base. DA

AIRCRAFT PRODUCTION

Rules for India-based joint ventures with foreign partners need relaxation. The immediate aim is to attract global companies to undertake the manufacture of their products in India. Over 50 per cent indigenous content has to be insisted. DRDO and Defence PSUs need to be made efficient and answerable. In the long-term privatisation is the answer. Meanwhile, position well paid professionals to head important DPSU projects. India will need about 2,00,000 skilled people in the defence and aerospace industry in 10 years. Foreign companies can use India as an export hub like it happened in auto sector. There is considerable opportunity at subsystem levels in aero structures, avionics and actuation and control

A lot has happened since Prime Minister Modi raised the 'Make in India' banner earlier this year. "We have the reputation of the largest importer of defence equipment. We too need to increase our defence preparedness. We need to modernise our defence forces," Modi said. Finally the country is moving with a sense of purpose. An energetic Defence Minister has cleared a spate of modernisation programmes and existing programmes have accelerated. Attempts are on to neutralise years of inaction. There is no doubt that for any country to be a global power, it has to have a strong indigenous defence industry. Hike of FDI in defence production to currently 49 per cent (can go higher, if the project brings state-of-the-art technology); investments up to 24 per cent by foreign institutional investments; there is no longer a need to have a single Indian investor with at least a 51 per cent stake have been cleared. A 'Make in India' defence manufacturing summit and global CEO conference was chaired for the first time by Defence Minister in February 2015. Revamping Defence Research and Development Organisation (DRDO) through younger laboratory directors and coordinating private sector participation are great initiatives. The thrust is to increase share of manufacturing from the current level of 15 per cent of Gross Domestic Product (GDP) to 25 per cent and create additional employment opportunity of ten million per year.

State Of The Nation

We are in a dismal state in defence production. Low investment in R&D; socialistic workforce with low productivity; generalist bureaucracy controlling and deciding technical activities; grown from the ranks and often fatigued PSU higher management and lack of initiative and drive to achieve results. LCA is over thirty years behind schedule; Intermediate Jet Trainer (IJT) has serious technical problems; Basic Trainer Aircraft (BTA) is not even on drawing board. The Russia led Fifth Generation Fighter Aircraft (FGFA) and Medium Multi-role Transport Aircraft (MTA) joint programmes are facing delays and unacceptable design and development cost escalations. Private industry is pussyfooting their entry because of high investments coupled with uncertainty.

China has risen to be the fifth biggest weapons exporter. In the same period India replaced China as the number one arms buyer importing 12 per cent of the world's total sales. India's DRDO, Ordnance Factories and Defence Public Sector Undertakings like Hindustan Aeronautics Limited were in place in initial years after independence. Yet 68 years later India imports around 70 per cent of its military hardware. In aviation we are nothing more than a foreign licensed production house. The case in point is the manufacture of *MiG* series, *Jaguar* and *Su-30 MKI* fighters; *Avro* and *Dornier* light transport aircraft and *Chetak* and *Cheetah* helicopters. Aircraft production quality has often been in question. Many aircraft accidents have been attributed to HAL's quality control. High import content makes India vulnerable to supply lines being chocked at inappropriate times.

Major Indigenous Projects

HF-24 Marut, India's first major aircraft design and development project in the 1960s had a very underpowered engine and was mired with maintenance problems and lived a short life. HAL made basic trainer *HT-2* and later *HPT-32* and *HJT-16 Kiran* intermediate stage trainers, in spite of being not state-of-the-art, saw through IAF's training. In 1997, HAL began design work on an Intermediate Jet Trainer (IJT) designated *HJT-36 Sitara.* After 15 years of design and development, HAL admitted that the IJT needs basic design review with help of a foreign consultant. Over ₹ 4,000 crore have been spent and much more is required. HAL basic trainer aircraft even if given go ahead today the *HTT-40* could join the IAF not earlier than 2022. HAL's Advanced Light Helicopter ALH *Dhruv* entered service in 2002. It flies with all the three Indian Armed Services and few other agencies. Limited numbers have been exported. At least nine aircraft have crashed in accidents due to technical reasons. *Dhruv-WSI* is the weaponised version called *Rudra.* The basic platform is being used to develop a Light Combat Helicopter (LCH) and Light Observation Helicopter (LOH). Over 200 have been built till date. We can safely term the ALH an Indian aircraft design and production success.

DRDO designed, HAL built Light Combat Aircraft LCA *Tejas* has had a long history. IAF has a requirement of at least 220 aircraft. Indian Navy needs 40 to replace *Sea Harriers.* The aircraft achieved Initial Operational Clearance (IOC) in December 2014. On 17 January 2015 the first aircraft was handed over to IAF. The optimists expect the Final Operational Clearance (FOC) by early 2016. It requires 500 successful test flights to achieve it. The full complement of the first squadron is expected by 2017-18. While it is claimed that LCA has 70 per cent indigenous components, currently it has an American GE F-404 engine, an imported radar and large number of other foreign subsystems. The aircraft currently does not meet the performance specifications. It is proposed to be replaced by the more powerful and bigger GE 414 engine which would entail a total redesign and fresh flight testing. The new aircraft *LCA Mk II* may join the service 10 years hence.

Undoubtedly HAL and IAF's Base Repair Depots (BRDs) have mastered the art of license production and overhaul. Thousands of mostly British, French and Russian aircraft have been built. While production quality may have been an issue, they have served the IAF well. The ratio of 'real' indigenous content versus imports has actually progressively deteriorated from 45 to 36 per cent.

Air Marshal Anil Chopra PVSM, AVSM, VM, VSM, (Retd)

The writer was a pioneer of the *Mirage 2000* fleet and commanded a *Mirage* Squadron, two operational air bases and the IAF's Flight Test Centre ASTE. He was the Team Leader of an aircraft upgrade project in Russia. Currently he is a member of Armed Forces Tribunal at Lucknow and a member of Executive Council of Jawaharlal Nehru University, New Delhi.

Challenges And Opportunities

Service Headquarters are often asked to dilute the Service Qualification Requirements (SQRs) to accommodate local defence industry at cost of Op efficiency. HAL and other DPSUs often pitch for products well beyond their current know-how. Often they offer fully imported products with a 'Made in India' tag. Notwithstanding, the nationalist military encourages Indian products. The DRDO and DPSUs are government controlled organisations which follow seniority based system of individual growth. The brainy guys leave early for better pastures. No wonder 30 per cent scientists in US space agency NASA are Indians. R&D products often don't translate into inductable end products. Similarly, the Ordnance Factories are mammoth set-ups run in old dilapidated buildings with a low industrial technological base. They also manufacture personnel clothing, shoes and small field items that can more economically be outsourced to civil industry. A full-scale overhaul of DPSUs and OFs is required. Privatisation is the way. *Embraer* of Brazil is a successful model to emulate.

Private sector was allowed 100 per cent participation in defence production in 2001. Lack of a level playing field for the private sector *vis-à-vis* the DPSUs and the foreign original equipment manufacturers (OEMs) continued to dampen the initial enthusiasm. The

access to the military's 15-year Long-Term Integrated Perspective Plan (LTIPP) was to help industry plan ahead. DPP has been made more India friendly. Political drive was required to push through the dithering 'Make' policy of 2006. DPP of January 2011 had thrust towards Indian industry, but had not taken off due to ambivalence. A new DPP is expected shortly. Many countries have allowed FDI in defence but kept the 'ultimate' veto share. USA, France, UK and Germany, allow FDI in defence industry with prespecified restrictions. Notwithstanding the apprehensions, it is not easy for a foreign investor to antagonise the local government which can easily put export restrictions and cancel all local orders. Foreign companies need to be encouraged to set-up manufacturing in India.

Indian industry has become a hub for world's auto industry. Its software strengths are unmatchable. Tata Power and Larsen & Toubro manufacture *Pinaka* multi-barrel rocket launchers. L&T was involved in developing a hull for a nuclear submarine for the Indian Navy, Tata Power is handling modernisation of airfield infrastructure for IAF and Reliance Industries is active in aerospace and homeland security. Mahindras are already making small aircraft. Pipavav Defence is producing defence products. EADS unit Cassidian wants to make India a hub for large number of defence products that are locally manufactured and also offer technological value. BAE's US arm plans to shift *howitzer* assembly to India. There is also a large maintenance, repair and overhaul market (MRO) which can create R&D base for engineering services. If we can have a successful space and nuclear programme; we should succeed in aircraft production.

Germinating Offshoots

Of India's defence market 70 per cent is through imports, 25 per cent with the Defence PSUs and remaining 5 per cent with private partners. In 2012, Centum Group, a Bangalore-based defence electronics company was selected to supply to French-based defence solutions provider Thales. It is now cleared to supply directly to any of the 70-plus Thales subgroups which cater to US Armed Forces. In 2011, Tata Power Strategic Engineering Division (SED) – won a US$ 186 million contract from the Indian Army to manufacture two electronic warfare systems to be deployed in mountainous regions beating Israeli firm Elta. Tata Power SED has secured orders for *Pinaka* Multi Barrel Rocket Launcher, *Akash* Army Launcher and Integrated EW System for the Indian Army and the *Akash* Air Force Launcher for the Indian Air Force. During the June 2015 Paris Air Show Indian conglomerate, US$ 16.9 billion, Mahindra Group bagged a large aero-components production contract and will manufacture a variety of metallic components for several Airbus aircraft. Mahindra Aerospace will deliver in excess of a million parts per annum. Bharat Forge is aiming to become a major player in the artillery and specialised vehicles segment. Several small companies – such as Dynamatic Technologies, Avasarala Technologies, DefSys, Ravilla and Taneja Aerospace – have of late acquired advanced technological capabilities. Dynamatic Technologies makes assemblies of vertical fins for *Sukhoi 30 MKI* fighters. Samtel electronics makes *Su-30* Head up Displays and other electronics. Indian companies have global opportunity not only due to cheaper skilled labour, but have also developed the ability to manufacture accurately to specifications, particularly in aerospace, metalworking and electronics.

Defence Production: A Complex World

Two major manufacturers, Boeing and Airbus, control bulk of the civil aircraft market; half a dozen players control business jet market; there are only 5-6 jet engine manufacturers and only three countries have reasonable access to stealth technology. The transfer of technology contracts are most difficult to interpret and implement. There have been Transfer of Technology clauses in many contracts but physically nothing significant has been transferred. India has been unable to leverage its high imports on this count. No one wants to share highend technology even for money. Soviet Union and China rode to aviation success by reverse engineering Western aircraft designs. Joint ventures are the only interim option for India. It is thus time to recast ourselves for the daunting task of indigenisation. In the long run large sums have to be invested in 'focused' defence R&D.

Clear Perspective

Since the launch of the ambitious 'Make in India' initiative, 46 licenses have been issued in the defence sector to produce items including light armoured vehicles, artillery weapon systems, UAVs and underwater systems. Private players have also been given industrial licenses to produce electronic warfare systems, air defence weapons and armoured panels for helicopters among other items. Rules for India-based joint ventures with foreign partners need relaxation. The immediate aim is to attract global companies to undertake the manufacture of their products in India. Over 50 per cent indigenous content has to be insisted. DRDO and Defence PSUs need to be made efficient and answerable. In the long-term privatisation is the answer. Meanwhile, position well paid professionals to head important DPSU projects. India will need about 2,00,000 skilled people in the defence and aerospace industry in 10 years. Foreign companies can use India as an export hub like it happened in auto sector. There is considerable opportunity at subsystem levels in aero structures, avionics and actuation and control. The government is introducing a technology development fund. Offsets policy needs to be leveraged for acquiring state-of-the-art technology and skills. Can we think of strategic sale of part of DRDO and some DPSUs to Indian corporates? Defence contractors such as Boeing, Lockheed Martin, Airbus, Thales and BAE Systems sense a great opportunity. In addition to the economic benefits, increased jobs, improved capability and the development of critical technology, indigenisation would ensure India has ready access to the best available defence equipment. Being a capital-intensive industry, overseas borrowing norms need to be relaxed. In view of very scarce resources, FDI in the defence sector could be the most effective catalyst for self-reliance. PM Modi has the best credentials to get the house in order. DSA

OP SINGH IPS

DIRECTOR GENERAL
NATIONAL DISASTER RESPONSE FORCE

OP Singh is a senior official with Indian Police Service (IPS) since 1983. He has held several positions of responsibility in the State of Uttar Pradesh addressing issues of law and order, crime prevention and detection, Intelligence, Security, Traffic management, managing mega events (including *Ardh Kumbh Mela* of Allahabad), police telecommunication, community policing etc. He has also served in Special Protection Group (PM's security) and Central Armed Police Forces like CRPF and CISF dealing with issues connected with internal security, security of the Airports of the country and specialised VIP protection to certain categorised persons within the country. Presently he is Director General of National Disaster Response Force engaged in providing immediate response in the event of natural or man-made disasters as well as proactively involved in community capacity building for disaster response.

The Government of India has awarded him with Indian Police Medal for Gallantry, Indian Police Medal for Meritorious Service and President's Police Medal for Distinguished Services, the highest decoration for a police officer in India. He has won Commendation Discs of the Police Chief, besides several commendations and appreciations from the State Government of Uttar Pradesh and other authorities for excellent service-oriented policing in *Ardh Kumbh Mela* at Allahabad and resolving long-standing disputes between Shias and Sunnies at Lucknow in 1998. In September 2014, disastrous amnesia had left the State of J&K with worst floods in 80 years. Not only did he as Chief of NDRF galvanise his force immediately, but supervised the rescue operations in Srinagar personally winning encomiums for his force from local population, state and central government and media at large. During this national crisis, NDRF saved the lives of more than 50,000 people including foreign nationals. NDRF, under his command, did excellent rescue work during Nepal Earthquake of April 2015 and its role was applauded by both governments of India and Nepal for stellar performance to rescue live victims from the rubbles. OP Singh as DG, NDRF personally coordinated, oversaw and fast tracked disaster-related operations in a foreign land where 76 rescue teams from 34 countries also participated. He holds a Master's Degree in Political Science from Delhi University, MBA in Disaster Management and MPhil from Madras University. He has the distinction of having graduated from National Defence College, New Delhi, a premier and prestigious institution of excellence in India. DSA

75 YEARS OF THE CRPF

CRPF draws manpower from all States and Union Territories and it also provides assistance to all State and UT administrations in managing law and order in limited local mild situations like strikes and riots, tense situations like local agitations, State Assembly elections and major religious pilgrimages like *Kumbh* and *Amarnath Yatra*. It maintains internal security during national challenges like general elections, nationwide strikes, insurgency, terrorism and Left Wing Extremism.

The Force was raised on 27th July 1939 in Neemuch in Madhya Pradesh, as Crown Representative's Police – renamed as Central Reserve Police after independence, with no greater fanfare than would a small band of eight officers, thirty subordinate officers and nine hundred and seventy other ranks, of trained and dedicated personnel, in urgent situations to quell an already-raging *Praja Mandal* agitation spread in a number of princely states across pre-independence India.

Today it is the largest paramilitary force in the world with 4,997 officers, 2,98,538 non-gazetted ranks, total 3,03,535 including ministerial, medical and all support staff. It is deployed within and outside the borders and a burgeoning image exuding confidence among Central and State governments and public alike for its quality, endurance and bulldozing resilience unaffected by varieties of adversities.

Inception And Deployment Pattern

In keeping with its mandated requirements, the Force was constituted in highly mobile units. A proposal is under examination to subsume Zones into Divisions, confining the mobility of the Force within them to ease the ever-increasing stress and strain on the men. It is expected that the new system would strike the desired fine balance between operational efficiency and rest and refitment requirements of the Force.

Presentation of Presidential Colours by Sardar Vallabhbhai Patel

Geographical deployment of the Force after quelling the said agitation in princely States of Central India, spread slowly but steadily to containing the banditry in Central and Western India followed by integration and consolidation of Indian States during independence and subsequent frequent border skirmishes on Western border and J&K. Later, the Force was deployed in J&K and post reorganisation of Indian States, in North-east to deal with the Naga insurgency.

Post-independence, the complexion of traditional law and order saw a steady transition into insurgency in Naga and Mizo hills, which consumed considerable length of time and efforts of the Force to bring under control which was eventually achieved by devolution of power through democratic methods. During early eighties, terrorism evolved in its strongest form in Punjab, necessitating widespread deployment of the Force in strength with improved tactics and weaponry to contain almost in a decade through strong will and precipitate action, both by political and executive organs of the government, albeit at great cost of men and material to the Force. Frequent and fierce spate of communal riots of mid-eighties, in certain pockets of multi-ethnic, multi-religious India, necessitated inception of Rapid Action Force, a sub-force, during 1990, which has stabilised at the strength of ten units strategically located and always trained and rehearsed, ready to take on the pre-identified challenges across the length and breadth of the country.

Pt Jawaharlal, the PM, accompanied by PL Mehta, IGP inspecting the Guard of Honour

Spread Of Naxalism

The rudimentary Naxalism of Charu Majumdar of late sixties, resurrected with intense indoctrination, mass participation and ample supply of weapons and explosives in the states of North and Eastern Andhra, Chhattisgarh, Jharkhand and Odisha, where poverty, slow-paced administration and unemployment were raging high. This time around, its incidence was alarmingly high and spread fast. About one-third of the Force is engaged in containing its onset by deliberate and chance operations, manual and aerial surveillance, weaning out the masses through civic programmes, with development to go along. Opposition to civic programmes and development from Naxal ideologues has compelled the government to carry them out under the direct supervision of the Force. This adds an important dimension to the scope of charter of duties of the Force, pregnant with new and numerous solutions to the problem.

Growing Responsibilities

The specialised responsibilities of guarding the Parliament and Prime Ministers, also gave rise to units of Special Duty Group and Parliament Duty Group the efficacy of which was amply proved when terrorists attacked the temple of democracy, the Indian Parliament on 13th December 2001. CRPF has the distinction of raising an entirely female unit in 1987 for day-to-day law and order maintenance where a large fraction of population consists of female citizens.

Foreign Assignments

To assist IPKF, two units along with one company of *Mahila* Bn of the Force, were deployed in Sri Lanka during 1987 and continued for 20 months. The Force acquitted itself with great credit earning one *Veer Chakra* and two *Sena* Medals, while 15 personnel laid down their lives and 26 sustained serious injuries. The Force also contributed 105 personnel to UN mission in Haiti under UN Resolution 940 of 1994, for various police and security duties from March 1995 to November 1996 and another large contingent of 240 personnel to UN mission in Kosovo. The Force created history of sorts when the first All Women Formed Police Unit was deployed in Liberia in 2007 to provide succour and relief to the war ravaged women populace of Liberia and to empower the National Police Force of Liberia. The women acquitted themselves creditably and continue to inspire the women of Liberia who thronged to join the Liberian National Police in large numbers after the induction of women FPUs. So far nine female Formed Police Units and seven male Formed Police Units have served with the United Nations Mission in Liberia. One of the most prestigious duties being performed by the women is guarding the Liberian President's office of Ms Ellen Johnson Sirleaf, the first female President of any African country.

Public outreach by Indian female FPU in Liberia

The Training Component

The Force, as of now, has institutional training capacity of about five to six thousand recruits per year, the shortfall supplemented by Ad hoc Training Centres. Apart from basic training, six to eight week's refresher training is required for the troops every year to update their knowledge and skills which can be carried out at Unit HQs locations in peace areas and Group Centre for Units in field areas. Besides, upgradational (pre-promotional) training and specialisation training courses, like in special weapons, staff duties, law officers' duties etc, need to be carried out at Central Training Colleges. At present the Force is conducting eight types of Basic Training Courses, 35 Pre-promotional Courses and more than 33 specialisation courses with requirement of conducting many more. Rotational retraining for units in field areas is being carried out at chosen locations acting as training nodes. Thus the training establishment of the Force is marginally under capacity, which needs to be made-up and reviewed periodically.

Some of the old-age arsenal items like the good old .303 bolt action rifles and 2″ Mortars which served the Force for a long-time, were replaced by the advanced 7.62 mm self-loading version, later supplemented by other small arms like *AK* series rifles, whereas among the area-weapons the basic 2″ Mortar was replaced by 51 mm and 81 mm Mortars, supplemented by AGL, UBL and MBL for jungle warfare role, on operational compulsions. Addition of UAVs to the inventory, for anti-Left Wing Extremism operations in selective area specific roles has enhanced and revolutionised the operational capability of the Force. This piece of equipment would prove a game changer for the Force and open the possibilities of strategic and real time tactical

intelligence collection for the Force under operational role – an essential area paid less attention so far.

Present Shape And Size

From a humble beginning of one Battalion of eight officers, 30 Subordinate Officers and 970 other ranks, begotten by the 'urgency' component in the Internal Security aspect in the history of the nation, the Force has evolved and multiplied to be the largest Paramilitary Force in the world comprising of 231 Units (including 4 *Mahila* Bns, 10 RAF, 10 CoBRA, 05 Signal Bns, 1 Special Duty Group and 1 Parliament Duty Group), organised in Force HQs and four Zones, further distributed in 22 Sectors (including training and communication), 43 Ranges (including training and communication), two academies, four CTCs, eight RTCs, three CIATs, eight other training institutes – one each for Intelligence, IED, IT, Public Order Management, CoBRA Training, Training of Trainers and Canine Training.

Manpower Management

The Force draws manpower from all States and Union Territories of the country and it also provides assistance to all State and UT administrations in managing law and order in limited local mild situations like strikes and riots, tense situations like local agitations, State Assembly elections and major religious pilgrimages like *Kumbh* and *Amarnath Yatra*, maintaining internal security during national challenges like general elections, nationwide strikes, insurgency, terrorism and Left Wing Extremism. The Mission and Charter of Duties of the Force and continuity of challenges from local mild to national tense, warrants the deployment of the Force by turns, leaving hardly any elbow room for the much-needed respite of rest and refitment.

Under these circumstances, the Force needs to come out with a deployment pattern to afford the men one mild or peace tenure after every two field tenures, either by rotation across all theatres in the country or by localising the Force within a Zone of choice and rotate the Force for peace and field tenures within the Zone. While the first option has put the Force under tremendous amount of stress and strain continuously, the second option is fraught with the dangers of losing all India character. The third option left, therefore, would be to afford adequate time for rest and refitment, by distributing the units Zone-wise only for rest and refitment and field tenures to be completed out of the home-zone. This arrangement would afford the troops equitable time in field and peace areas and maintain its all India character, necessary for efficiency, efficacy and mutual intermixing of troops.

The Force has, probably by default, remained devoid of any intelligence network of its own for a long-time. While majority of senior Commanders did not think it necessary on account of its mandate, whereby, the Force assists the State police in maintenance of law and order, thereby making it imperative on the part of the local police to provide the much needed intelligence inputs, there were many who were against empowering the Force with its own intelligence set-up. Though quite late, the apparatus has now been put in place, pending inculcation of subtle intelligence culture among the field commanders below Battalion level and most importantly regular supply of elixir of real time intelligence to them, before every operation, for better results and least casualties.

Strengths And Weaknesses

The CRPF, drawing and deliberately maintaining representation of manpower from all States and Union Territories, is a major internal security force of the country with an all India character which is the USP of the Force and therefore much sought after by the States. Representation of multiple States, regions and ethnicities in smallest body of men instils the much required confidence among the sections of public and State governments alike. It is an added advantage with the Force which is neither available to Army with troops of ethnic or regional purity nor to State Police with personnel from a particular region.

The Force possesses a rich treasure of experience of working in different States, theatres of operation and variety of situations from maintenance of law and order to fighting insurgency, terrorism and Left Wing Extremism. The experience withers away as and when the officers and men leave the Force, uncodified into AARs (mentioning the aims, objects achieved, strength and weaknesses noticed, lessons learnt and recommendations made, for additional training and/or equipment) and Administrative Reports duly reflected in permanent records in due course. This presupposes allocation of this work at Range, Sector and Force HQs levels even at the cost of additional staff for this important piece of additional task.

The training capacity required by the Force is spelt out by the fact that reckoning thirty-three years normal service tenure for personnel, three per cent of Force would be replaced every year, wastage on account of operational casualties, medical and voluntary retirements being additional. Thus, for an over three lakh strong Force, the annual (recruitment and training) capacity of nine thousand personnel would be required. As for the constabulary, six months recruitment period and forty-four weeks of training totals to gestation period of sixty-eight weeks. Therefore, either the vacancies be forecast and advertised seventeen months in advance or 3 per cent training reserve should be maintained in entry-level rank, to achieve zero vacancy in the Force. DSA

CRPF Jawans during a rigorous training session

MBDA SYSTEM

Defence and Security Alert: **The defence sector was opened for the private sector in 2001 but a very small proportion of what MoD buys, comes from the private sector. What, in your opinion, are the reasons that account for this storyline? Is this scenario poised for a paradigm shift with the government's 'Make in India' initiative?**

MBDA: Whether in Europe or India, it is not easy for the private sector, particularly if you're talking about SMEs, to get involved in defence procurement. There are a number of reasons for this but the main issues revolve around the very long lead times and upfront investment that is required. These two factors effectively exclude many private sector companies from getting involved in major ticket defence projects. Without its domestic government support, even a company as large as MBDA could not finance on its own the kind of financial investment necessary for R&D to keep at the very cutting edge of the kinds of technology involved in the complex weapons sector. This is a dichotomy as the sector needs the dynamism of the high technology SMEs because it is here that some of the most skilled programmers and electronic engineers can be found – you only need to look at the number of technology start-ups over recent years in India. That is why MBDA has been involved in a number of initiatives aimed at supporting SMEs to enter the market. Our experience in managing complex supply chains, involving a number of diverse partners, has been a great advantage here. With regard to India we have always insisted that the sector really needs to draw on the very advanced skills and expertise that already exist within the country, it needs to look beyond the traditional DPSUs as a sole source. India certainly needs to make greater efforts to promote defence research and development beyond the DRDO.

For PM Modi's 'Make in India' strategy to be the success that everybody hopes that it will be, the private sector will have to play its role and be treated as an equal partner and I believe that he has recognised this. When it comes to awarding Make in India or Buy and Make in India contracts, the private sector needs to be included in the equation. With regard to research, I'd strongly recommend that India spreads this across a wider range of institutions, including academia. MBDA is already establishing important partnerships with Indian SMEs concerning a number of projects that are underway and of course the more involved we become with companies such as these, the more they start to benefit from the years of expertise we have gained in developing and working on some of the world's most complex guided weapons systems projects. Regarding academia, we are also actively involved in sponsoring some of India's brightest aeronautical engineering students to further their studies in one of Europe's top technology institutes located in the south of France.

LOÏC PIEDEVACHE
Country Head, MBDA Group, India

DSA: **How is this initiative conceptually different from the 'Make' procedure introduced by MoD in 2006? In your opinion, has the government formulated a sector-specific policy and evolved a new procedure to execute the 'Make in India' initiative in defence? If so, could you please elaborate and also tell us whether you are satisfied with the efficacy of the new sector-specific policy and the related procedure? If not, what, in your opinion, still needs to be done?**

MBDA: The 'Make in India' initiative is certainly a strong statement from PM Modi and a crystal clear indication that he is committed to boosting local industry and indigenous production. Of course at the moment it is somewhat premature to talk about its prospective efficiency or to compare it with previous initiatives. MBDA has already been making in India in partnership with BDL regarding the *Milan* missile for over 40 years. We remain committed to India and to its growing industrial structure. We are therefore keen to see how the government's new policy will implement the Make in India initiative and allow us to further boost our commitment to India.

DSA: **The Technology Perspective and Capability Roadmap of 2013 intended to sensitise the industry about the technologies and capabilities armed forces would require in the next fifteen years so that the industry could gear up itself for meeting the requirement. However, it did not play out the way it was expected to. What do you think is the reason? What kind of information would the industry need from MoD to be able to prepare itself to meet the requirement of the armed forces?**

MBDA: It is not really for MBDA to discuss about the 2013 TPC Road Map. A road map is crucial to align the armed forces' requirements (which are usually expressed in the short-term), the government's spending plans and the longer-term development ideas of the DRDO. That is the way things have moved in the UK and France where MBDA works closely with the respective governments and ministries of defence to make sure that the industrial supply chain is in line with and prepared for both short and long-term complex weapons requirements. This calls for a large degree of openness and trust and of course regular communications between all the parties involved.

DSA: **'Make in India' has created a buzz around the world attracting big players in defence manufacturing to the burgeoning Indian market. How do you think 'Make in India' will accelerate the creation of a Military Industrial Complex in India? Do you think the industrial ecosystem in India is conducive to defence manufacturing? If not, what are the major issues that need to be addressed by the government?**

MBDA: The building blocks are already in place, the skills are there, the infrastructure with the DPSUs, the academic institutions capable of training the next generation of engineers and programmers are either established or being developed. As I have said the SME technology sector is burgeoning and needs to be exploited within India's defence supply chain, not only in terms of production but also in R&D. Don't forget India has made some excellent products such as *Agni* for example so it is not as if the country is having to start from scratch. But you mustn't forget

either that the ability to master and exploit the latest advances in defence technology thinking does not happen overnight. There is a long learning curve which, if you take MBDA as an example, comes from over 50 years of developing complex weapons. That is why India needs to look to transfer of technology at the highest level, such as that proposed by MBDA regarding SRSAM and the fifth generation ATGM. Unfortunately, up to now India has been rather short-changed by some of its overseas suppliers who have only provided lower tier technology transfer relating to fairly basic componentry that will not add to India's skills and knowledge base.

Make in India is an excellent initiative which shows that PM Modi is truly committed to making India a major player in the world's defence industry sector. Clearly, an important country like India, with the real military challenges it is facing on its borders, cannot continue to be the world's largest importer of armaments. Europe has long recognised the need for sovereignty in the area of defence equipment. PM Modi has clearly recognised the importance of this for India as well. That in itself is an important first step.

DSA: Your company makes products of critical importance for India. How do you propose to align your future plans in India with 'Make in India' campaign?

MBDA: We have been committed to Make in India, even before it was announced as a strategy by PM Modi. By this I mean that we have always looked at our relationship with India as much more than a buyer seller relationship, we have always been intent on developing a relationship based on a partnership. This is what we are doing and will continue to do. Our projects underway are of course getting us more and more involved with industrial partners of all sizes in India.

DSA: As you have seen, the new government's Defence Acquisition Council has been hyperactive in clearing mega projects. What new products and technologies is your company offering to India?

MBDA: We have a number of campaigns underway which we hope will build on the recent successes we have had with MICA and ASRAAM for the IAF in the aircraft upgrade programmes. Of course with the recent decision to take 36 *Rafale*, we'll be discussing the full weapons suite of air-to-air, air-to-surface and countermeasures to optimise the combat performance of this excellent aircraft. There are a number of other projects we're discussing regarding the *Rudra* and the LCH helicopter requirements. In fact and I don't want to go into details as the competitions are still ongoing, but as the only company in the sector able to meet the guided weapons requirements of each of the armed forces – land, sea and air – we are offering an exceptionally wide range of solutions. These range from air defence to coastal batteries and from land combat weapons to cruise missiles.

DSA: Co-development and co-production are the new catch phrases in defence manufacturing in India. How do these figure in your scheme of things and what kind of commitment is your company making to India?

MBDA: For several years we have openly discussed the advantages that the SRSAM or MAITRI project would bring to India, not just in terms of its operational advantages for the military but also for the industrial advantages associated with the transfer of the most modern technologies that this project involves. As you know, SRSAM is a co-development with the DRDO with technology transfer covering the latest RF seeker and propulsion technologies amongst others. Production covering missiles (benefitting from MBDA's transfer of technology regarding the setting up of automated production lines), C2, radars, launchers would be in India and managed by BDL and call on an extensive in-country supply chain that MBDA could help with.

This co-development model has been under discussion since about 2006 when it was mooted through an inter-government agreement between India and France. This has given us ample time to fine-tune and optimise the model which we are now proposing in terms of a fifth generation ATGM or land combat weapon based on the MMP which we are developing for the French Army. A co-development here would again see the Indian defence industry sector getting access, through full technology transfer, of next generation technologies in a weapon geared to India's specific requirements. Given that the technologies are already being tested to get MMP into service in around 2017, much of this co-development, should it get the green light, would be already de-risked – a major plus point in terms of the advanced technology that would be involved in this project.

DSA: Making in India for export is also gaining credence because of cheap labour, stable political and socio-economic environment and pro-business and industry policies of the Modi government. How does your company plan to use this opportunity to further strengthen cooperation and collaboration with India?

MBDA: Talking about cheap labour is doing India a disservice. India can offer highly qualified and skilled engineers and technicians who are just as good as those that can be found in Europe. Of course the costs for this kind of expertise are much higher in Europe so India has a significant advantage to offer in this respect. I've already mentioned SRSAM and the fifth generation ATGM. Well, both of these are aimed at significant export market opportunities that are just waiting to be filled by the right solutions. With production carried out in India, our global sales team with its well established customer contacts would be available to help India maximise the export potential of both weapon systems. DSA

Mahindra DEFENCE

MAHINDRA GROUP RISING TO THE OCCASION

SP SHUKLA
President, Mahindra Group

'Make in India' is an excellent initiative to create partnership between Ministry of Defence, Armed Forces, DPSUs and Indian private sectors. Not only will this help in creating an indigenous production base for defence equipment which is a critical requirement when the need arises, it will also help in upgrading the technological base, reducing long-term cost, as well as generating lakhs of jobs for our growing young population.

Opening up defence production to Indian private sector has been a very welcome step. This enables a large pool of well established industrial companies in private sector to partner foreign OEMs to set-up production facilities in India for equipment which has always been imported. With more than one company (whether in public sector or private sector) the technology absorption capacity will multiply manifold in India. As a result, we will achieve indigenisation at a much faster pace rather than relying on just a few units as was the case for several decades.

Furthermore, an element of competition between different units in private and public sector will also bring in efficiency and cost effectiveness in indigenous production.

Another interesting outcome of opening defence production to private sector is that, now different units in India can engage with different technology partners from abroad so that multiple product options become available in India for our defence forces in the long-term. This broad-basing of technology base as well as faster pace of technological absorption as mentioned above, will help in creating an appetite for innovation and hence R&D in the sectors.

Mahindra Group has perhaps the oldest relationship with the Defence forces in the country. It is a well-known fact that one of our founding businesses was military jeep just after the Second World War. The relationship later expanded to different types of armoured vehicles and general service vehicles. Today Mahindra Aerospace and Defence Sector comprises of 9 operating companies engaged in designing and producing products across a wide spectrum. Mahindra is perhaps the only business group in India which has both the interest and capability to serve the needs of all 3 wings of our defence forces – Army, Air Force and Navy.

Raksha Udyog Ratna was a very good concept which would have helped in fast-tracking suitably identified large projects in private sector. As the draft policy was prepared few years ago, it may require some fine-tuning but it can still serve as a good base to give impetus to indigenous defence production in the country. Needless to say, this will also lead to development of small and medium industries as vendors of these larger firms.

All over the world, the supply of defence equipment (or withholding of it) is an important policy tool in foreign policy of major industrial nations. India should develop its indigenous defence industry which will be befitting to its aspired status to be a permanent member of Security Council. Indian companies would be able to export defence equipment to a large part of the globe – especially Asia, Africa and Latin America.

However, for exports to become a reality, we have to first achieve economies of scale in domestic production for which ability to be able to supply to our own defence forces is a must. During last one year, several policy initiatives have been taken, such as higher FDI and delicensing of large number of items in defence production. We now look forward to launch of several major programmes under 'Make in India' umbrella where firms such as Mahindra will actively participate, so that needs of our armed forces can be met indigenously at competitive prices and with the added advantage of service support being available at all times in the country itself. Mahindra is committed and geared to rise to the occasion in the service of the nation.

On this note, I would like to share some wonderful news. Recently at Paris Air Show, Mahindra has announced several fruitful partnerships with major players in the global aviation sector namely – Airbus, GE Aviation, Magellan Aerospace and Telephonics Corporation with whom we already have a Joint Venture. We will endeavour to have a part or a component on every platform of Airbus in future. By being a critical player in the global supply chain in the aerospace and defence industry, we aim to contribute significantly in giving concrete shape to 'Make in India' initiative. DSA

A SUCCESSFUL LEGACY IN INDIA

Rolls-Royce, with a legacy of over 80 years has been a partner in India's defence modernisation and remains committed to country's efforts towards achieving self-reliance. The launch of first Tata Aviation Services aircraft which was powered by Gypsy engines marks the beginning of company's association with India. In 1933, Indian Air Force took to the skies powered by Bristol Jupiter engines. Over the years, we have played a pivotal role in the development of India's aerospace industry.

Rolls-Royce is working towards the indigenisation of the Indian defence industry by exploring strong partnerships with companies who share our goals. We are already working with many partners in India which we are proud of – TCS, QuEST and HAL. We will continue to support India thereby delivering 'better power for a changing world'.

Government Initiatives

The government wants to encourage public sector, private sector and foreign firms for developing a dynamic defence industrial base with access to cutting edge technologies. Foreign firms have an opportunity to turn into strategic partners as India needs their technology, skills, systems integration and manufacturing competitiveness. The government has taken many initiatives towards firming and reinforcing the idea of local manufacturing.

The latest initiatives on defence modernisation and indigenisation are welcome. These initiatives should not be seen in isolation; they are part of a long journey that India has been on for the last sixty years and throughout this time Rolls-Royce has continually invested in improving the capabilities of Indian industry.

Interestingly, Defence sector in India saw tremendous growth last year with the clearance of around 40 new defence acquisition proposals. Fast track approvals of pending projects have boosted business sentiment. Recently, the government announced its plans of creating special zones for defence manufacturing. In addition to this, the Ministry of Defence has formed a 10-member committee to clear policy framework for defence procurement procedures under the 'Make in India' initiative. Upgrading the country's military capabilities is critical for India in present geopolitical context. The government has acted expeditiously and cleared various long-pending demands of armed forces for new weapons.

With increased FDI limit, India can now focus on increasing its share of defence budget to R&D which is only 6 per cent compared to 15 per cent in France and 12 per cent in the US. This will help catalyse rapid indigenisation and substantially increase the attractiveness of the sector as a place to transfer technology and set-up a manufacturing hub. There will be opportunities to further contribute in the development and upgrading of India's defence sector by offering world-class innovative products and services.

The latest move by the government to withdraw excise and customs duty exemptions given to defence PSUs are the right steps taken to boost defence manufacturing and will encourage foreign players to explore business opportunities in the country. The Indian aerospace and defence market is among the most attractive globally as the country is the highest importer of defence items in the world. This move will send a definitive message to foreign OEMs that India is open to business for defence manufacturing and will further push the government's 'Make in India' initiative.

Another such effort is the Skill India initiative by the government, which is expected to skill 500 million youth by 2020. For a long time, India has relied on the service sector for growth. To create jobs for India's working-age population, which is 64 per cent of its total population, the country needs to focus on manufacturing-driven growth. The 'Make in India' campaign will enable the country to meet the targets envisaged in the National Manufacturing Policy, which aims to create 100 million manufacturing jobs and raise manufacturing's contribution to GDP from 16 per cent today to 25 per cent by 2022. Thus manufacturing growth will play a crucial role in the task of upskilling India's workforce and increasing employability of youth.

STEVEN GILLARD
VP, Customer Business – Defence, Rolls-Royce

Rolls-Royce And 'Make in India'

Our long-standing commitment to 'Make in India' is unique. Rolls-Royce supports this progressive initiative as it will not only help Indian industries become globally competitive but will also allow companies like us to further support the country's modernisation needs.

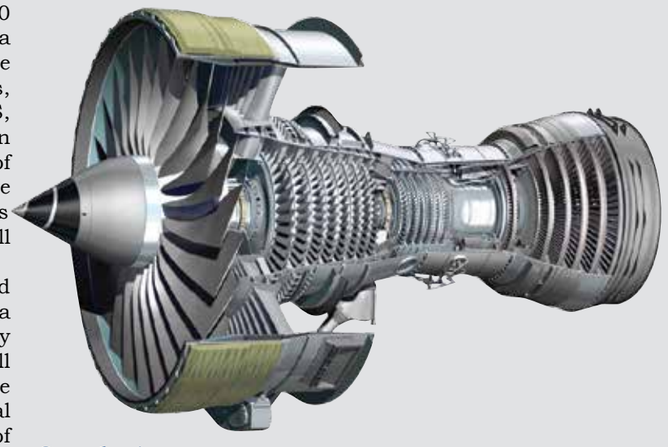
Quite rightly much of the recent debate has focused on defence procurement procedures and questions around FDI. Both of these are important elements in helping India to harness the dynamism of the private sector and to encourage the inflow of capability from abroad. On the FDI point, Rolls-Royce has demonstrated, with HAL, how it is possible to deliver world-class aerospace manufacturing in India with the appropriate management structures in place. Our 50:50 IAMPL Joint Venture manufactures parts for our civil engines worldwide delivering long-term benefits to India and Rolls-Royce's global customers. The establishment of IAMPL wasn't required by an offset commitment, it was the result of recognition of the value that both parties could add to each other. Today, the Bengaluru facility is in full production, employing over 140 people and will produce 25,000 aerospace parts for Rolls-Royce in 2015 across a wide range of engine programmes including for the Trent XWB. In addition, around 1,000 engineers, through our partnership with QuEST and TCS, work at Rolls-Royce managed engineering centres in Bengaluru. This is one of the largest population of Rolls-Royce engineers outside the UK and they provide high quality engineering solutions and services across the entire product development life cycle across all our sectors including civil aerospace.

Further to this, the company has recently announced expansion of its engineering capabilities in India through a new facility in Bengaluru that will employ 500 people by 2017. The work done at the facility will include aerospace engineering for customers in the region as well as support for Rolls-Royce's regional supplier base. It will also include the development of new tools and technologies that make best use of the capabilities that exist in India.

We believe that the same is true in defence where India can add value to Rolls-Royce's global customer base and Rolls-Royce can deliver in-country capability to India. Continuing to make India an easier place to do business will only strengthen this case.

Prospects For The MNCs

Local manufacturing provides an opportunity for MNCs to design and manufacture products that are tailored to Indian operating conditions, which are different compared to other countries – be it how products get transported, how they are installed or under what power conditions they operate. One of the key advantages is the availability of skilled labour at a relatively low cost as compared to other countries. In certain sectors such as defence, companies get special investment privileges like several tax exemptions to invest/manufacture in India. India has an advantage of majority of young population. The focus right now is also on skilled workforce which is going to be a further advantage.



Conclusion

India is among the fastest growing economies in the world. It is a key market for Rolls-Royce which has a proven track record of investing in the country's aerospace capabilities. With India's focus on strong economic and infrastructure growth, Rolls-Royce is trusted to deliver excellence with its broad range of products and services and meet customer needs to achieve long-term growth. With our product portfolio, we believe that we can offer India the right combination of experience and new technologies, to contribute towards building capabilities for India.

BEYOND SECURITY

KABA

Self Boarding Revolution

Self boarding has been reinvented with a revolutionary boarding gate reader concept

Have you ever wondered how a self boarding gate knows who is entitled to pass at a specific time and date? And how can the airport manage to verify and secure all the data needed and collected? In comparison with a typical hardware boarding gate reader, a self-boarding gate is a far more complex and valuable device with a number of components included that all have to be coordinated, managed, maintained and somehow connected to the airline's passenger processing system.

IT integrators are usually forced to gear deeply into these systems and tools, and they are not at all happy with this. Kaba has now developed a way to connect the airline passenger processing systems with self-boarding gates while still enabling airports to monitor and manage these devices from a central point, as well as integrate any additional processing (such as biometrics, airport badge readers or other peripheral devices) seamlessly and easily. Easy device integration The Kaba Boarding Gate Reader (BGR) is an extremely effective software application running on the internal gate computer and allowing for dependable communication between the gate's devices and the airline host systems. It emulates the AEA BGR protocol for the relevant CUTE specifications needed. Thus it is not necessary for the IT integrator to adapt each device protocol to the host system: the BGR does this automatically. It controls various components such as scanners, printers, displays, the gate itself and others. These can be configured freely for the needs of different airlines using the same gate. The Kaba BGR has been certified

A self boarding gate is a far more complex and valuable device with a number of components included that all have to be coordinated

by some of the most renowned airport system integrators, namely SITA, ARINC and Ultra, for theAEA 2011 standard currently in use, but it already features the AEA 2012 standard as well and is compatible with former AEA standards. Free choice The great advantage of this BGR is the investment protection offered by free choice of peripheral devices on the self-boarding gate, the airline individual configurations, any type of pre-validation or pre-processing such as biometric lookups or boarding pass validation checks. It complies with the latest CUTE and CUPPS standards and can be updated easily in case of future changes. Combining these advantages, the BGR is the best solution for the implementation of selfboarding devices.

In addition, Kaba has also

Gates for automated boarding pass control or self-boarding. The gates can be equipped with Kaba's Boarding Gate Reader for easy integration of devices and the PaxCheck application for the monitoring and control of one or several gates

The PaxCheck software allows the simultaneous monitoring and control of multiple gates at multiple locations, as well as the retrieval of check-in data, such as use time of gate and check-in location developed complementary management software called PaxCheck, which enhances the BGR's flexibility and functionality Control at once PaxCheck is a server-driven software where all Kaba self-boarding gates can connect to, and which enables airports and airlines to control, configure and monitor the gates at one or even multiple airports.
It allows for centralised server logging and updating of the connected BGRs. Airline individual profiles can be stored on the PaxCheck server and maintained from a central source.

Furthermore, with a specific client application, gate agents can now get direct information on the status of the self-boarding gates and can directly control and influence the boarding parameters such as priority boarding and boarding speed.

Improving the passenger experience while simultaneously coping with ever-increasing passenger numbers, safety regulations and growing cost pressure has always been a challenge for airports. With its innovative and flexible concepts for automated passenger handling solutions, in combination with the Kaba BGR and the PaxCheck management and monitoring software, Kaba helps airports achieve these goals.

Specifically checking the passenger's identity at the boarding point will play a major role in the future. Kaba has participated in a number of pilot installations and has demonstrated that with the flexibility of the Kaba BGR, biometric passenger processing is a reality today.

As a unique feature, the Kaba BGR can integrate any type of biometric check or pre-validation in the self-boarding process without having to impact the airline boarding gate reader process.

Physical Access Systems
for passengers and self

Make in India
this is the step of a Lion

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ENERGISING 'MAKE IN INDIA' IN DEFENCE

There are a whole lot of issues ranging from the process of industrial licensing to taxation, land acquisition to security, labour laws to intellectual property rights and from foreign direct investment (FDI) to exports that need to be addressed. Increase in the FDI limit in defence to 49 per cent, though a step in the right direction, cannot work wonders.

Much before 'Make of India' became the new buzzword for making India a manufacturing hub, the Ministry of Defence (MoD) had been trying for a long-time to achieve this feat.

From 2002, when the first Defence Procurement Procedure (DPP) was laid down, till 2013, when Technology Perspective and Capability Roadmap (TPCR) was released to sensitise the Indian industry about the future requirements of the armed forces so that it could prepare itself to meet the challenge, MoD kept trying to encourage the Indian industry to get into defence production in a big way.

Surely, these efforts have had limited success. India has actually emerged as the largest importer of defence equipment in the recent years as it continues to meet anywhere between sixty to seventy per cent of its requirement of defence equipment through imports.

Whether it is procurement of ordnance and other stores out of the revenue budget or acquisition of major equipment, weapon systems or other platforms and capabilities from the capital budget, there has been a growing emphasis on procurement from indigenous sources.

Conceptual Context

If anything, the call for 'Make in India' has created a conceptual parallax in so far as the defence production is concerned. Is it a call to the foreign companies to set-up their manufacturing base in India or is it a call to the Indian companies to enter the league of big manufacturers?

Defence production cannot be a zero-sum game; only a combination of the foreign and the Indian companies working in concert can make India a manufacturing hub. But while the Indian companies would like to be the prime contractors in every production and acquisition programme, it is doubtful if this coincides with what the foreign companies and governments understand from the Prime Minister's call of 'come, make in India'.

Only a combination of the foreign and the Indian companies working in concert can make India a manufacturing hub

The existing procedure addresses this dichotomy by stipulating clearly who will play the lead role under each of the five categories through which capital acquisitions are made. These categories are arranged in a hierarchical order with 'Buy (Indian)' being the most favoured and 'Buy (Global)', at the other extreme of the spectrum, being the last resort.

For acquisitions under the 'Buy (Indian)' category, the Request for Proposal (RFP) goes only to the Indian companies. Under the 'Buy and Make (Indian)' category also, which is the next in the order, the RFP goes to the Indian companies which can, of course, tie-up with the foreign companies.

Abysmal Delay

The third category is the 'Make' category. Intended to be the real game changer, as it is meant for indigenous research, design and development of the prototypes of futuristic high technology complex systems by the Indian companies in collaboration with the foreign companies (if required), the 'Make' category has had little success. Since the time it was introduced in 2006 not a single project has so far reached the contract stage.

The remaining two categories are 'Buy and Make' and 'Buy (Global)'. In 'Buy and Make' projects a certain quantity of the equipment is purchased from a foreign vendor with the rest of the required quantity being made in India by an Indian company through transfer of technology. From tanks to aircraft, a lot of equipment has come through this route.

Although the foreign Original Equipment Manufacturer (OEM) is the prime contractor in a 'Buy and Make' project, it is the Indian Production Agency (IPA) which undertakes production of the equipment under the 'Make' portion of the contract. For one reason or the other in most of the cases so far Defence Public Sector Undertakings (DPSUs) have been nominated as the IPA.

In 'Buy (Global)' cases, the RFP goes to the foreign as well as the Indian vendors.

The 'Make in India' call has given rise to the question as to how is this new initiative different from the policy and the procedure being followed all along in so far as the defence sector is concerned. It is time the Defence Production Policy of January 2011 is brushed up and aligned with the current realities to answer this question.

But that is not the only question on which depends the success of the renewed efforts to energise the defence manufacturing sector in India.

Perception Problems

With a perceived bias in favour of the private sector companies, the 'Make in India' initiative has also created the impression that the government intends to wind down the role of the DPSUs and the Ordnance Factory Board (OFB) in defence production. The recent government notification withdrawing the excise and custom duty exemption from them with a view to creating a level playing field with the private industry has reinforced that perception.

The public sector companies and the ordnance factories are not going anywhere. It would be naive to write them off. Instead, efforts need to be made to

Amit Cowshish

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improve their performance and productivity. In fact, the question of synergising the role of the foreign OEMs, DPSUs, OFB, Indian private sector (including micro, small and medium enterprises) and even the Defence Research and Development Organisation needs to be addressed at the policy level.

The Catch

But companies, whether foreign or Indian, would invest in defence manufacturing only if there is a business case for doing so. Except for very large global giants, who have deep pockets, state-of-the-art technologies to offer, established markets and, in some cases, the support of their governments, the executives in the private companies will not be able to go to their boards with an investment plan if they cannot convince the board that there is a contract lurking somewhere at the end of the investment.

There cannot be a business case for investment if there is no clarity about the kind of equipment MoD would buy, the numbers and the likely time frame within which it is likely to come out with an RFP. The TPCR of 2013 did not help matters as it threw little light on these crucial questions. Along with the Defence Production Policy, the TPCR also needs to be recast to make it really useful for the industry.

The industry can perform only if the eco-system is conducive to its efficient functioning

If there is one aspect of the defence acquisition regime in India that has faced incessant criticism it is the web of procedures widely perceived as highly complex and cumbersome. Some of this criticism is unwarranted. It is difficult to accept that after six revisions in a decade since it was first promulgated in 2002 the DPP still suffers from palpable shortcomings.

New Procedures Required

But perceptions are as important as reality. Therefore, if 'Make in India' is intended to play out differently from how the defence procurements have been conducted in the past, a new set of procedures will have to be put in place. It is a huge challenge as not all new ideas and suggestions aired at countless seminars and symposia in the national capital and elsewhere are workable. Be that as it may, things are unlikely to move unless this challenge is faced squarely.

The policy and procedure concerning procurement need to be separated from each other. While there must be a fair amount of long-term stability in regard to the policy, the procedures must be designed to be dynamic and flexible. The whole range of policies and procedures, ranging from categorisation of the acquisition proposals, modality of government-to-government agreements, offsets and execution of make projects requires to be revisited.

New defence procurement structures were created in 2001 based on the recommendations of a Group of Ministers. The structure has served well but it is disjointed. A procurement proposal moves through the Services Capital Acquisition Plan Categorisation Committee (SCAPCC) and the Services Capital Acquisition Plan Categorisation Higher Committee (SCAPCHC), both of which are a part of the Joint Staff headquarters and the Defence Procurement Board and the Defence Acquisition Council, which are a part of the MoD, before it is accorded the approval in principle, thereby paving the way for the tendering process to start.

The follow-up action is taken by the Capital Acquisition Wing which is a part of the MoD. The Services and other departments play some role or the other at various stages in the long process that precedes approval of the competent financial authority – Finance Minister or the Cabinet Committee on Security in most cases – which sets the stage for signing of the contract.

This disjointed structure is not conducive to efficiency. Practices followed by other countries, especially in regard to handling of greenfield manufacturing projects, could serve as the basis for revamping the existing procurement structure.

A 10-member committee is presently seized of the entire range of questions regarding procurement policy and procedure. Hopefully, it will address most of these issues.

The industry can perform only if the eco-system is conducive to its efficient functioning. India stands at the 142nd position in the global index of ease of doing business that ranks countries on several parameters ranging from getting credit to enforcing contracts.

Improve Ease Of Doing Business

The present government is acutely aware of the importance of the ecosystem. It has repeatedly expressed its intention to improve India's ranking but this brooks no delay and disjointed efforts at making the atmosphere industry-friendly could defeat the purpose.

There are a whole lot of issues ranging from the process of industrial licensing to taxation, land acquisition to security, labour laws to intellectual property rights and from foreign direct investment (FDI) to exports that need to be addressed. Increase in the FDI limit in defence to 49 per cent, though a step in the right direction, cannot work wonders.

Transparency In Decision-making

None of this would work, however, unless there is a qualitative improvement and transparency in decision-making and the officials in the MoD as well as the Services headquarters are freely accessible to those who are expected to shoulder the responsibility of making the government realise its dream of making India a manufacturing hub. A beginning could be made immediately for creating a forum where such interaction could take place freely. Change will not come about on its own; the political leadership will have to make it happen. DSA

SANJAY BHANDARI

Chairman and MD, OIS-AT

Defence and Security Alert: **Your company makes products of critical importance for India. How do you propose to align your future plans in India with 'Make in India' campaign?**

Sanjay Bhandari: We are privileged that we have been working for some years, on what is presently being termed as the 'Make in India' campaign. We have been making investments in the development and manufacturing of advanced technology products. We have developed four advanced Radars that are either an industry first or have features that are industry leading. As an Indian company, we are the owner of the intellectual property, having designed and manufactured advanced radars for international and Indian markets.

DSA: **As you have seen, the new government's Defence Acquisition Council has been hyperactive in clearing mega projects. What new products and technologies is your company offering to India?**

Sanjay Bhandari: We have advanced radar technologies where we have an air surveillance radar designed for detecting UAVs and other aircraft, whereas traditional radars are designed for fighter aircraft and helicopters. This can be used in air defence and homeland security solutions.

We have also licensed advanced technologies for air defence weapons and systems for manufacturing in India following Transfer of Technology.

DSA: **Co-development and co-production are the new catch phrases in defence manufacturing in India. How do these figure in your scheme of things and what kind of commitment is your company making to India?**

Sanjay Bhandari: We are investing in our development and production in defence manufacturing for advanced technologies.

We also propose to enter into co-development and co-production agreements for various weapons and defence system technologies which may involve a joint venture as required.

We are committed to advancing 'Make in India'.

DSA: **Making in India for export is also gaining credence because of cheap labour, stable political and socio-economic environment and pro-business and industry policies of the Modi government. How does your company plan to use this opportunity to further strengthen cooperation and collaboration with India?**

Sanjay Bhandari: Our investments in the products where we develop, manufacture and own the entire intellectual property of the product are specifically targeted for global markets and are not limited to India.

The four advanced radars that we have announced, viz 4D UAV Detection and Tracking Radar System, 3D Bird Detection and Deterrence Radar System, Foliage Penetration and IED/Mine Detection Radar System and Portable Ground Surveillance Radar System are designed, developed and manufactured for world markets.

We are taking 'Make in India' to the World. DSA

US-2 AMPHIBIAN AIRCRAFT

From an economic perspective the Japanese offer to manufacture the *US-2* in India in the private sector, will build-up the aeronautics supply chain and create a cluster of high technology SMEs servicing not only the *US-2* but also global aircraft and helicopter manufacturing companies quite like the Suzuki model which galvanised the automobile industry in India. The potential for export of the *US-2* aircraft to third countries under mutual agreement between India and Japan as well as the supply of sophisticated aero structures to global aircraft manufacturers can open a multibillion-dollar market.

An explosives-laden Pakistani trawler blew itself up in the early hours of January 01, 2015 after being intercepted by the Indian Coast Guard in the Arabian Sea about 365 km off Porbandar, Gujarat. After an engagement lasting about 4 hours the boat blew itself up and the evidence and crew with it. A second boat apparently made good its escape. A single amphibian aircraft carrying just one *prahar* of marine commandos would have made an arrest together with collecting incriminating evidence in only an hour's time, since there would be no time to scuttle the boat or obtain directions from their 'handlers'. One such operation would have made futile forever any such similar misadventures in the future by the sheer deterrence value of rapid surveillance, secure communications and prompt response that amphibian aircraft provide.

Operational Profile

Amphibian aircraft combine the capabilities of rapid surveillance and prompt response, whether for relief or arrest or intervention, in a single platform. Such a capability is not available on any other platform. Unlike helicopters and aircraft, amphibian aircraft can land at the location and enforce both the will and the law of the nation and thus are a platform of choice for military transportation, benign and constabulary missions of navies and possibly the Coast Guard for constabulary functions. Unlike ships, amphibian aircraft can reach the location far faster than ships can thereby preventing destruction or dumping of contraband/evidence or escalation of a precipitous incident at sea. This includes the ability of even shore-based military and political authorities to undertake a first-hand evaluation of a situation at sea which may have international ramifications if left to escalate without control. No other aerial or surface platform has such capability.

The operational profile of an amphibian aircraft comprised of a land/lake/river based launch with full cargo and personnel commensurate with the mission at hand, rapid transit to the target area mid-ocean or close ashore/inland water body, surveillance, data gathering and analysis during a stand-off ultra low-level and low speed loiter, alighting on the water for executing the maritime mission and then either transit to another destination or return to the parent launch facility.

Amphibian aircraft combine the capabilities of rapid surveillance and prompt response

Mission Specifications

However not all amphibian aircraft are suited for modern maritime missions. For mission effectiveness the main parameters of performance evaluation would be rough sea operations, range, payload, STOL capabilities, shallow water operations and beaching ability. Of these, rough sea operations are paramount for India. According to a study only about 60 per cent of all waves are below 1.2 m in height, but 96 per cent of all waves likely to be encountered are below 3 m in height. Amphibian aircraft must therefore, by design, have full operational capability to undertake maritime missions in wave heights of 3 m as a norm. The range must be adequate to conduct missions into the Malacca Straits on the eastern seaboard and into the Gulf of Aden on the western seaboard including an ability to reach the island nations in the region should the need arise. For disaster relief operations the amphibian must have a capacity for on-board first aid, a sick bay for at least ten patients and commensurate rescue gear. Short take-off and landing (STOL) features and shallow water operations must permit landing in busy waterways, possible riverine/high altitude lake operations as well as in open oceans. Low stalling speed would enable better observation of the target area to search for casualties swept away in cyclones or tsunamis. Passenger capacity should be sufficient to carry one platoon of rescue personnel together with disaster relief material. As a total force level the aggregate transportation capability of the amphibian squadron should be to be able to put ashore one battalion of army personnel in one tranche to make a mission truly successful. These missions would require about 15-18 amphibian aircraft after accounting for maintenance and strike off reserves.

US-2 Fits The Bill

The *US-2* alone meets and in many cases exceeds these operational requirements. With an ability to operate in sea state 5, landing take-off distances at about 300 m, transit speeds in excess of 550 kmph and a range of 4,500 km there is no other aircraft in its class. Combined with the world's only Boundary layer Control (BLC) system on a cargo and transport aircraft, spray suppression features, marinised AE 2100 engines, glass cockpits, pressurised cabins and highly sophisticated surveillance and communication suite the *US-2* stands out as a product of renowned Japanese technology. With an accident free record it is testimony to high-quality and sound design. The *US-2* has proven credentials of successful operations in open sea condition upto sea state 5 with wave height of 4 metres and a wind velocity of about 40 knots at a distance of about 1,200 km from mainland Japan.

This aircraft can be tasked for multifarious maritime missions such as:

- Ultra long-range naval logistic and maintenance support through ferrying of specialised dockyard personnel and spares to a Fleet during operational deployments
- Surveillance, reconnaissance, intelligence gathering and on the spot investigation and arrest in the EEZ and on the high seas
- Extended Range Visit, Board, Search and Seizure (VBSS) operations
- Oceanic search and rescue (SAR) and casualty evacuation (CASEVAC) from ships, submarines and oilrigs
- Mainland to distant island and inter island support without need of a runway
- Monitoring, servicing and protection of offshore assets
- Controlling derelicts
- Humanitarian assistance and disaster relief operations
- Countering small arms, shoulder launched weapons, drugs trafficking and terrorism at sea
- Countering illegal human migration
- Prevention of poaching and illegal fishing
- Prevention of toxic cargo dumping at sea
- Anti-piracy missions
- Support for deep sea mining activities, offshore cable laying and hydrocarbon prospecting
- Inland lakes and riverine operations

Faster Search And Rescue

Of particular relevance to the Indian Navy and in fact all navies that operate long-range maritime patrol aircraft is in the choice of the most suitable aircraft

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that can conduct a near all-weather high-speed rescue operation for the entire crew of a ditched aircraft. The aircraft is more easily replaceable than its highly trained aircrew. The rescue of a crew is faster and surer with amphibian aircraft than using ships or even helicopters. Such an assurance of recovery at sea builds huge confidence and markedly improves operational performance of the aircrew – capability that does not exist as of now. The same could also be true in case of submarines and ships in distress or damaged at sea. In the latest accidents involving IN *Dornier* and ICG *Dornier*, a *US-2* amphibian may well have saved some crucial lives of crew, since it can fly low and fly slow with excellent endurance and unique capability to conduct both search and rescue in one high-speed platform. These capabilities along with a modern surveillance cum weather radar and various sensor suites such as the Survivor Position Optical Targeting system (SPOT) make *US-2* ideal for long-range SAR missions.

Strategic Pay-off

From a strategic perspective India must not only be able to address its own immediate security needs and defeat the enemies of the state but must also be able to contribute in the safety, security and stability in its area of interest and influence. In the maritime arena this power status contributes to burden sharing towards protection of global public goods and the oceanic commons to achieve firstly, freedom of navigation and safety at sea; secondly, promote regional stability through an open and participative security architecture; thirdly, proactively alleviate suffering during disasters in the littorals of friendly nations and, finally a constabulary capacity to maintain order at sea for the common good of the region.

Prime Minister Modi and Prime Minister Abe in their Joint Summit Statement of September 3, 2014 exhorted the Joint Working Group to 'accelerate discussions on the collaboration of the *US-2*'. As per the fact sheet circulated by the Ministry of Foreign Affairs, Japan the *US-2* collaboration seeks to concurrently advance the aeronautics industry including the final assembly and manufacture of the *US-2*, its maintenance, repair and overhaul and parts manufacturing in India. The *US-2* will also be permitted to be exported to third countries under mutual agreement. It is evident that the collaboration on the *US-2*, between India and Japan, is at the international level of immense diplomatic and strategic import, whilst at the domestic level the downstream benefits are across the military, technological, economic and social sectors.

Technological Bonanza

From a technology perspective the final assembly, integration and delivery of the aircraft from a manufacturing facility in India will leapfrog India to amongst the few nations in the world with the ability to build sophisticated amphibian aircraft. One offshoot of this technology induction would be the ability to design and build the next generation amphibian aircraft for providing a civil use platform that would link the island territories directly with the mainland without recourse to runways which damage the sensitive ecology of the islands. This would open up the tourism trade and rapidly develop these off lying islands. The *US-2* induction has the potential to partner with National Aeronautics Laboratory in the design and production of the Regional Transport Aircraft which could well be amphibian catering to not only internal routes but also exclusive and difficult to access island resorts across the globe from a variety of destinations across the world.

This is the first time ever that any country has offered to develop an aeronautics industry in the private sector in India through a well targeted partnership and therefore the *US-2* collaboration programme is completely aligned with Prime Minister Modi's 'Make in India' initiative.

US-2 collaboration programme is completely aligned with PM Modi's 'Make in India' initiative

From an economic perspective the Japanese offer to manufacture the *US-2* in India in the private sector, will build-up the aeronautics supply chain and create a cluster of high technology SMEs servicing not only the *US-2* but also global aircraft and helicopter manufacturing companies quite like the Suzuki model which galvanised the automobile industry in India. The potential for export of the *US-2* aircraft to third countries under mutual agreement between India and Japan as well as the supply of sophisticated aero structures to global aircraft manufacturers can open a multibillion-dollar market. This would offset the defence import bill to some extent.

From a social perspective the *US-2* induction would open the manufacturing sector with much needed high skill jobs. It is learnt that Japan has also offered to train Indian technicians in Japan in aeronautics and avionics. Thus there would be genuine capacity building and capability development in India. India's island territories have virtually no scope for runway construction and consequently the inhabitants are denied simple medical and modern amenities. Requiring neither runway nor other airfield facilities modern amphibian aircraft can safely land within a few metres from the coast or islands and relief material and teams can be ferried ashore through integral boats requiring no logistic support from the shore.

In addition, partnering with Japan for collaboration on the *US-2* aircraft is of immense strategic value to India in its path of progress towards realising a world-class 'Make in India' aeronautics and aircraft manufacturing ecosystem in the nation.

The operational, technological, economic and social benefits of this Japan-India collaboration on the *US-2* is indeed a 'Make in India' force multiplier for India and its Armed Forces. DSA

HAL'S ROLE IN 'MAKE IN INDIA'

T SUVARNA RAJU, CMD
Hindustan Aeronautics Ltd

HAL, as a major aerospace DPSU Ministry of Defence, right from its beginnings has assimilated the 'Make in India' concept. We continue to believe in this and accordingly several strategies are being implemented at HAL for indigenous development of aircraft, helicopters, aero engines, UAVs, aircraft systems such as avionics, mechanical systems etc. Some of the indigenous development programmes that are underway at HAL include Light Combat Aircraft (LCA) – *Tejas*, Intermediate Jet Trainer (IJT), Hindustan Turbo Trainer *(HTT-40),* Advanced Light Helicopter (ALH -WSI), Light Combat Helicopter (LCH), Light Utility Helicopter (LUH), Pilotless Target Aircraft (PTA), Fixed and Rotary wing Unmanned Aerial Vehicle (UAV), Advanced 25-kN Aero Engine and Mission Computer (MC), Aircraft Display systems and AESA Radar etc.

Our indigenisation activities include development and import substitution efforts. In order to attain higher level of self-reliance, HAL has been making efforts on indigenisation of components, accessories and systems required for manufacture as well as repair and overhaul of aircraft, engine and associated systems. I am glad to inform you that every year more than 2,000 items are indigenised with considerable foreign exchange savings.

On the external front, HAL and DRDO labs have been collaborating on a number of design and development programmes in aeronautical sector. There are various forums existing currently to provide a common platform for industry and R&D organisations to synergise HAL and DRDO efforts. HAL is engaged with various DRDO labs and organisations in the various Research and Development fields for LCA, IJT, FGFA, *Su-30MKI*, *Jaguar*, *MiG-27 Upg*, *Do-228*, ALH, LCH etc.

We also believe in involving academia for technology development. We are strategically partnering with academic institutions for various projects. HAL has entered into Memorandum of Understanding (MoU) with academic institutes and created Chairs at Indian Institutes of Technology (IITs) for technology collaboration. We have initiated joint programmes with academic institutions in the areas like Unmanned Aerial Vehicles (UAVs), Rotary Wing UAVs, Transmission assembly, Material development and production of Aero Engine Blades etc.

The development of domestic vendors has always been part of our exercise. The aerospace sector is expanding globally and India is emerging as one of the largest defence markets. With opening of Indian defence sector and the encouragement to private sector participation, the private sector particularly small and medium enterprises (SMEs) are expected to grow. HAL is playing a proactive role in helping these businesses for the ultimate benefit of the country. HAL has developed a good vendor base within India and presently more than 2,500 vendors are registered with HAL. HAL is currently outsourcing its manufacturing activities to the Indian private industries and around 25 per cent of the total Standard Man-Hours (SMH) is outsourced and it will be increased in the coming years.

HAL is making all efforts to maximise its outsourcing of manufacturing activities to private industries and take a role of an integrator. HAL is interested in supporting private industries by ensuring long-term business and lend its expertise in development and production, testing, certification and training.

HAL has embarked upon sharing its experience with other major PSUs for the benefit of its defence customers. We recently signed an MoU with Bharat Electronics Limited (BEL) for sharing expertise in avionics.

I also believe that R&D plays an important role in 'Make in India' drive. HAL has created an R&D corpus towards which 10 per cent of Operational Profit is allocated each year. The Company has reviewed its R&D policy to streamline various activities involved and a comprehensive R&D manual has been issued last year. A Committee of Institutions Network (COIN) headed by Director (Engg, R&D) has been formed unifying all the in-house R&D units under one technical leadership to have desired synergy in R&D efforts. DSA

DEVELOPING THE CONCEPT

Involvement of DRDO in 'Make/Made in India' projects is an essential prerequisite. It is important for DRDO to drive the programme till the successful development of prototype and then handshake with Services/industry to take the lead for mass production. DRDO will need to continue to assist the Armed Forces in the mass production stage too, since at this stage a number of problems will come requiring a technology oriented solution.

'Make in India' is a concept and a vision, a national vision. 'Make in India' is an initiative, that impacts the mind, more than the industry. 'Make in India' is perceived as a challenge, a transformational initiative, infusion and proliferation of technology, increased manufacturing capabilities, creation of capacities, jobs, skill sets etc. Idea was to have an increased sense of creating a mindset on self-reliance and achievement of foundational principles for looking within. Once we feel secure through our own efforts the impact will be out of proportion to the effort. Defence sector is by far the most innovative, since innovation is an essential prerequisite for survival. In an intense battlefield environment, sustained operations, innovation is a necessity, so by a stroke of natural instinct and demanding conditions, innovation happens, from the smallest of daily needs, administrative requirements, to the most highly technical and advanced weapon systems.

New Approach

It is the intent of the government to understand this vision and translate the vision into a formulation that could be inserted in a procedure so as to align this vision of the government with the Defence Procurement Procedures. The MoD has set-up a high-level committee of experts to examine aspects related to 'Make in India' and align the thought with the procedures to enable implementation.

The 'Make in India' programme includes major new initiatives designed to facilitate investment, foster innovation, protect intellectual property and build best-in-class manufacturing infrastructure. India's manufacturing infrastructure and capacity for innovation is poised for phenomenal growth: new smart cities and industrial clusters being developed in identified industrial corridors having connectivity, new youth-focused programmes and institutions dedicated to developing specialised skills. Major components of defence manufacturing have been excluded from a requirement for industrial licensing. Regulatory processes are being revised to align the policies towards ease of doing business.

No Cost, Firm Commitment

While 'Make in India' should be more liberal towards a regulatory regime to encourage manufacturing and creation of jobs within the country, it may also encourage partnerships, technology tie-ups, teaming arrangements, fully owned subsidiaries in selected areas and innovative business mechanisms to foster domestic industrial growth. 'Made in India', on the other hand, will be a focused initiative addressing Intellectual Property Rights, design, development, production and the entire product life cycle. This could be funded by the government in different ways and also allow adequate flexibility to take on industry challenge programmes. Concept of NCFC (No Cost Firm Commitment), is required to be introduced, industry in actual terms requires commitment more than funding in way of grants. While the government may not fund certain projects under a certain value, it may adequately compensate the vendor, who designs, develops and clears the mandatory trials and checks. Government also needs to provide commitment for numbers for induction. In cases where DRDO takes on design and development, on successful completion of trials Services may like to expedite induction before industry loses interest. Commitment of quantities and time for induction must always be given.

In accordance with the philosophy outlined above, categorisation and methodology for acquisition could be structured as given in succeeding paras. There should be no need to incorporate Buy and Make Global with ToT and associated nomination of Production agency. This must be done away with.

Make In India Category

What then must comprise 'Make in India'? This may include: (i) Come Make in India; in this case the foreign OEM is invited to set-up manufacturing facilities in India and create the complete ecosystem around manufacture on Indian soil. Associated IPRs, design authority, know-how, know-why may form part of this package. In a gradual manner a

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capability will develop. (ii) Buy Indian, where Indian industry has a matured product or is capable of manufacturing the same in the given time frames. The tender document (RFP) is issued to Indian vendors only. A greater percentage of value addition say at least 50 per cent is called for, so that impetus is provided for an increased indigenous content (iii) Buy and Make Indian, wherein, we buy some and make the remainder in India through the domestic industry. In a market driven acquisition, with a number of lead industries available as choice the best partnership will win and (iv) any other initiative that will cause manufacturing to happen in India. We may not rest with a manufacturing capability alone, some amount of IP and design authority is called for. In fact, we may like to call it as, 'Design and Make in India', rather than simply, 'Make in India'. Fundamentals of this categorisation include the operational necessity to procure the equipment in an expeditious manner, while a certain quantum of demonstrated capability is available in the country. Certain fundamental governing principles for 'Make in India', as laid down conditions, could be:

Demonstrated Capability: Either the capability already exists or through a mechanism of assessment, it is established that, such capability can be acquired in the given time frames.

Entrepreneurs: This category must enable participation by entrepreneurs and first-timers for low-value products.

Indigenous Content: The minimum specified indigenous content will be 50 per cent. This could include design, raw material, manufacturing and other disciplines of production. Indigenous content will be defined by commercial value.

Specification of Indigenous Content: In cases where the Indian industry (with or without the support of DRDO) have demonstrated higher indigenous content, the RFP shall specify the new threshold achieved as minimum indigenous content. This will be one of the recommendations of the categorisation committees (SCAP CC and SCAP CHC).

Concept of NCFC (No Cost Firm Commitment), is required to be introduced

Preference: 'Make in India' will be the preferred mode of categorisation of procurement that MoD may like to adapt. It is expected that a majority of procurement is undertaken through this route, may be 80 per cent and above, of all cases that are progressed.

MSMEs: 'Make in India' and 'Made in India', will incentivise MSMEs by encouraging/mandating the prime contractors to outsource atleast 20 per cent of the platform under development/production through MSMEs. This will also inherently be in conformance with the MSMED Act 2006.

Incentives: There is a need for providing incentives for higher indigenous content. Indigenous content in this case can be redefined as 'Indian Manufacturing Content'. This will be in-line with the support to the manufacturing sector. This is illustrated through an example, if the indigenous manufacturing content is greater than 50 per cent, a multiplier is provided; like:

- 50-60 per cent indigenous content = say a factor of 1.1 (Case A);
- 60-75 per cent indigenous content = say a factor of 1.25 (Case B);
- Greater than 75 per cent indigenous content = say a factor of 1.5 (Case C)
- This factor (can be revised) can then be used for determination of L-1 (by dividing the quoted cost by this factor). This is demonstrated by the following example:
- Case A – tender value = ₹ 100 crore therefore value for determining L-1 will be 100/1.1 = ₹ 90.91 crore
- Case B – for a tender value of ₹ 110 crore it will be 110/1.25 = ₹ 88 crore
- Case C – For a tender value of ₹ 120 crore it will be 120/1.5 = ₹ 80 crore
- ***As can be seen, even though the tender value of Case C was highest, he can still win the contract, by becoming L-1, due to the incentive provided for indigenous content.*** This will encourage industries to put in more local content and more domestic manufacturing. In cases where the design is also indigenous, then long-term soft loans for capital investment could be considered.
- This is just one example; there are many methods through which incentives can be provided.

Applicability: Procurement through 'Make in India' must be made applicable for all acquisitions wherein a demonstrated capability already exists or can be created with ease, by the industry. Where necessary, industry can co-associate DRDO with them in the bid process. Also, industry must take benefit of the technologies developed by DRDO, in similar programmes or offshoot programmes.

It is important for us to also discuss the concept of 'Made in India', as against 'Make in India' and see how they differ. Notwithstanding the difference in nomenclature, it is still a concept, most adept and in conformance with 'Make in India'.

Made In India Category

'Made in India' may encompass the following governing principles as fundamentals:

Design: Indigenous.

Manufacture: To be done in India fully and completely.

Raw Material: To be sourced as applicable while identifying critical areas for raw material for *ab initio* domestic development and production.

Supply chain: To be fully realised in India.

Funding: Will be provided for critical programmes. Eighty per cent of the development cost will be funded and could even be more, depending on the criticality of technology and patents etc.

Commitment: Government will provide clarity of numbers *ab initio* and also provide full commitment for procurement with timelines. Concept of NCFC (No Cost, Full Commitment) will be introduced for challenge projects.

Assured Orders: The commitment on the part of the government is full; if the programme reaches certain thresholds like 70 per cent of the Operational Requirement is met then MoD will place 30 per cent of the orders; if 80 per cent success level is achieved then 50 per cent of the orders and if the OR is more than 90 per cent then full quantity order will be placed.

Agencies: DRDO and industry.

Concept: DRDO does not take up projects if such a capability exists with the industry. Therefore first right of refusal may reside with the Indian industry to take on 'Made in India' projects. DRDO may like to step in only if the industry is not able to take on such projects for any reason or in such cases where the risk of development is pretty high. It is a well known and widely recorded fact that risk of failure in development projects is reasonably high. DRDO therefore, needs to be empowered with flexibility in adaptation of general financial rules, in order that the development project succeeds. For this they may need to take resort to the best-in-class for technology also known in the procurement language as (T-1) rather than the lowest bidder route also known as (L-1). It may be remembered that it is costliest for a nation to have cheap Armed Forces.

IP: IP for the project led by industry must reside with industry with the proviso that the government shall have full rights to use the same in the form that the government decides without any restriction, if the development is funded by Government (greater than 50 per cent and upto 80 per cent). In case of NCFC, the industry will have the full rights on the IP. In cases where the funding by government is greater than 80 per cent the Government will have the IP rights and the industry associated during development shall have the rights to use the IP as per the Terms and Conditions of the government. Government needs to be more flexible and friendly in such partnerships with industry.

Services need to be integrated into the design and development stage

Control and Monitoring: One single empowered Integrated Project Management Team (IPMT) is required, to handle high value government funded 'Made in India' programmes. Chairperson of IPMT will be entrusted with all responsibility for making the programme a success and could have the status of secretary to Government of India or such status commensurate with making of decisions resulting in the success of the project. The importance of the project will demand corresponding status of Chairperson. Reporting channels must be so specified that accountability and power of execution are harmoniously mixed. HQ IDS will provide all secretarial assistance. In my view 'Made in India' projects whether by industries or by DRDO or combination of both industry and DRDO, the design has to necessarily be Indian; for it to have the status and claim for 'Made in India'.

Should a new role be assigned to the new Scientific Adviser to Raksha Mantri or technology adviser to RM as Adviser Made in India? In the US model, DARPA, they have one Project Manager (PM) responsible for each DARPA project. The PM is hired from the market on contract for the duration of the project. Office of Director DARPA only manages/supports the requirements of DARPA PMs. There must be something right in what they are doing, since they seem to be by far most successful in design and development.

Services need to be integrated into the design and development stage till the product is cleared for mass production. HR management of Services may like to take care of continuity of high calibre officers with career protection in the interest of 'Make in India'. Armed Forces play a very crucial role in the success of 'Make in India', in the defence sector. All development projects to have 30 per cent Service component integral to the sanction of the project. In fact every DRDO laboratory should have a minimum of 30 per cent Service personnel on-site.

Levels Of Made In India

The following levels are envisaged:

Large systems of high value, such as tanks, helicopters, ships, submarines, aircraft and such like products, need thorough processing and funding development, strict monitoring.

Subsystems that are fitted into the main system, need to be identified early and these may not always require funding.

Smaller subsystems that are critical to the main programmes can be developed by small industries with niche capabilities. These invariably will be taken up by small industries and need funding and hand-holding.

Industry challenge: These will comprise of industry throwing in a challenge to indigenise portions of imported equipment or even design and development of some subsystems. There is a need to encourage this to bring the industry face-to-face with the buyer.

DRDO

Involvement of DRDO in 'Make/Made in India' projects is an essential prerequisite. It is important for DRDO to drive the programme till the successful development of prototype and then handshake with Services/industry to take the lead for mass production. DRDO will need to continue to assist the Armed Forces in the mass production stage too, since at this stage a number of problems will come requiring a technology oriented solution.

'Make in India' is a national effort. Every organisation has a role to play, including the common man. Every student of engineering, science, research and the various disciplines that create capability in defence sector must aspire to participate intimately. Academia, industry, research must join hands in this effort. If the base is healthy, the pyramid can be tall and strong. In the entire effort, at each stage MSMEs must be inclusively involved and strengthened.

THALES

SUPPORTING INDIA'S DEFENCE MODERNISATION NEEDS

According to the World Bank's latest Global Economic Prospects (GEP) report, India is, for the first time, leading the World Bank's growth chart of major economies with an expected growth of 7.5 per cent this year. Several sectors have contributed towards the growth of the Indian economy; defence sector being one of them. This sector in India saw tremendous growth last year with the clearance of around 40 new defence acquisition proposals, worth over ₹ 1 lakh crore.

The new government has been taking several initiatives to fortify the defence industry in India. As a major game changer, the Government of India recently withdrew excise and customs duty exemptions available to goods manufactured and supplied to Ministry of Defence by Ordnance Factory Board and Defence Public Sector Undertakings (DPSUs). This provides a level playing field to the domestic private players bidding for the Government contracts. Along with DPSUs, they will now also have the strategic advantage of quoting lower rates in open bids. With this initiative, the Government has also fulfilled the demand of foreign Original Equipment Manufacturers (OEMs) which are actively exploring the scope of future investments in India. Such government initiatives provide fillip to the business and encourage global corporates like Thales to strengthen their presence in the country.

The increase in FDI in defence to 49 per cent last year is also a positive move that will be vital to enhance the industrial base of the sector. Today, the Indian defence sector is at the threshold of immense possibilities in terms of attracting investments and strategic alliances, setting up of manufacturing facilities, obtaining technologies and capabilities apart from generating high-skilled employment.

With a long and distinguished history in India, Thales has been recognised as a strategic partner in India's defence modernisation. Thales has been present in India for over 60 years and has been contributing to the development of the country in the fields of defence, aerospace and ground transportation (railways and metros) where its solutions, technology and capabilities could be used. The company, operating in the country through its subsidiary Thales India Pvt Ltd, has around 300 employees across its offices in New Delhi, Bangalore, Hyderabad and other cities. Thales aims to further develop local skills and capabilities especially in engineering and business related domains to support future growth and development.

Thales has been offering full scope of its defence expertise and experience to the Indian Armed Forces for years. For the Air Force, Thales supplies the reconnaissance pods *Vicon 91*, avionics solutions and Inertial Navigation System and GPS (INGPS) systems. Thales is on-board the Indian Air Force *Mirage 2000* and also on the *Su-30*, *MIG-21* and *27*. We have also been chosen by the Indian Ministry of Defence to supply radars and air surveillance solutions, including the *FLYCATCHER Mk1* and the low-level transportable radars *GS100*. Thales also provides the Indian Army with Electronic Warfare (EW) capabilities and optronics. The Group delivers EW systems for the Indian Navy too together with long-range surveillance radars, anti-submarine warfare sonars and mine-hunting solutions.

In one of the recent developments, the Government has envisioned building an indigenous industry to boost manufacturing and attract funds to build the country's infrastructure through the 'Make in India' initiative. The 'Make in India' initiative is focused on 25 sectors including defence manufacturing. This initiative encourages foreign players to develop strategic partnerships with Indian companies and leverage domestic markets that not only helps build domestic capabilities but also boosts exports in the long-term.

Thales's strategy of developing its industrial footprint in India is in-line with the Indian government's 'Make in India' initiative and of developing the defence base of the country. The company has been working closely with the Indian industry – DPSUs and private players – since its inception in 1953. In 2008, Samtel and Thales formed a joint venture (JV) to locally develop and produce Helmet Mounted Side Displays, Military Avionic and Airborne Sensor systems for the defence market. Later in 2012, Thales formed a JV company with Bharat Electronics Limited (BEL) dedicated to the design and development of civilian and select military ground based radars for India and the Global markets. This JV was incorporated in August 2014. In June 2014, Thales and L&T Technology Services formed a JV with a view to develop software engineering activities in India, particularly in the avionics domain. Thales has also been associated with Hindustan Aeronautics Limited for over five decades now in all the technological areas that can be used for military aircraft.

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Country Director & VP, Thales India

Further making the 'Make in India' policy concrete and real, Thales – through its 'Go to India' initiative – has also been co-operating with the Indian private sector particularly large corporate players and SMEs to build transfer of technology and supply chain partnerships. Thales has extensive experience in liaising with numerous group supply chain partners to support the local industry in India and open up growth opportunities for them. The group is committed to enlarge the share of Indian Companies in its global supply chain.

Building a local defence industry will require substantial investment in capital and human resources, long-term strategy, legal and financial adapted frame and deliveries as per plan for foreign and Indians players. While companies today are ready to invest in the defence manufacturing, they need easy norms of doing business in India and simplified defence procurement procedures.

For decades, Thales has proactively shared knowledge, technical know-how and expertise with the Indian industry. Going forward too, the company would continue to capitalise on its expertise and support the government in realising its defence modernisation goals.

Honeywell

Defence and Security Alert: **The defence sector was opened for the private sector in 2001 but a very small proportion of what MoD buys, comes from the private sector. What, in your opinion, are the reasons that account for this storyline? Is this scenario poised for a paradigm shift with the government's 'Make in India' initiative?**

Arijit Ghosh: Militaries around the world are looking to do more with what they have, including maximise mission success, increase performance and lower costs. India is no different. Whether it is increased performance through propulsion, improved mission success with precision navigation or maximised troop safety through technologies that keep aircraft safely in the air, we build our technology to cater to all these requirements simultaneously. It is inevitable that the drive for 'Make in India' will continue to percolate through the defence industry. I am sure that private sector participation and contribution to Indian defence will rise in the near future.

DSA: **How is this initiative conceptually different from the 'Make' procedure introduced by MoD in 2006? In your opinion, has the government formulated a sector-specific policy and evolved a new procedure to execute the 'Make in India' initiative in defence? If so, could you please elaborate and also tell us whether you are satisfied with the efficacy of the new sector-specific policy and the related procedure? If not, what, in your opinion, still needs to be done?**

Arijit Ghosh: The Defence Procurement Policy is evolving. The 'Make' procedure, introduced by the MoD in 2006, was a step designed to encourage indegenisation and self-reliance in defence. The 'Make in India' initiative encompasses multiple sectors above and beyond defence and therefore, the thrust and importance given to the 'Make in India' policy is more comprehensive.

DSA: **The Technology Perspective and Capability Roadmap of 2013 intended to sensitise the industry about the technologies and capabilities armed forces would require in the next fifteen years so that the industry could gear up itself for meeting the requirement. However, it did not play out the way it was expected to. What do you think is the reason? What kind of information would the industry need from MoD to be able to prepare itself to meet the requirement of the armed forces?**

Arijit Ghosh: While I cannot speculate about the reason behind a stated outcome, I think it was a good step to sensitise the industry about the technologies and capabilities armed forces would require in the next fifteen years so that the industry could gear itself up to meet this requirement. The ability of the industry to actually acquire such capabilities would depend upon the nature of technologies desired, the state of the defence industry's existing capabilities, the gap between the current and desired capabilities and the regulatory regime governing foreign partners' ability to collaborate.

DSA: **'Make in India' has created a buzz around the world attracting big players in defence manufacturing to the burgeoning Indian market. How do you think 'Make in India' will accelerate the creation of a Military Industrial Complex in India? Do you think the industrial ecosystem in India is conducive to defence manufacturing? If not, what are the major issues that need to be addressed by the government?**

Arijit Ghosh: For the 'Make in India' campaign, three elements are necessary: land, labour and capital. With specific reference to the aerospace sector's labour pool, it will be crucial for the government and ministries of human resources and education to focus on developing an entire learning ecosystem around aeronautics in order to ensure that the 'Make in India' campaign is successful over the long run. Companies themselves will also need to take more initiative in offering and measuring training programmes that will further boost the capabilities of domestic employees and suppliers.

Relationships like ours with Tata Power SED on the Honeywell TALIN inertial land navigator will be critical for the success of 'Make in India' and we are encouraged by the government's efforts to attract foreign investment into the country. The continuation of the government's support will allow Indian companies to continue to gain access to the technology, skills and international markets required for sustainable defence growth.

DSA: **Your company makes products of critical importance for India. How do you propose to align your future plans in India with 'Make in India' campaign?**

Arijit Ghosh: We will continue to evaluate potential collaborative opportunities as they arise and decide accordingly. The foreign direct investment cap increase from 26 per cent to 49 per cent is a positive step forward and we hope the government will continue to explore new opportunities to make investment in India attractive for companies that must take on significant risk in order to enter into a domestic partnership.

DSA: **As you have seen, the new government's Defence Acquisition Council has been hyperactive in clearing mega projects. What new products and technologies is your company offering to India?**

Arijit Ghosh: In 2015, we will start the first phase of the agreement where Tata Power will receive the production kits as well as the training and expertise to assemble the system. By 2016, we will move into phase two where Tata Power will take on the manufacturing of these build kits under license from Honeywell. Today, Honeywell is focusing on the domestic market opportunity; however, Tata Power SED could explore export opportunities in the future as the programme evolves.

DSA: **Co-development and co-production are the new catch phrases in defence manufacturing in India. How do these figure in your scheme of things and what kind of commitment is your company making to India?**

Arijit Ghosh: India is a very important high-growth region or HGR, for Honeywell, alongside China, Indonesia, the Middle East, Turkey and Brazil. HGRs are regions that have either fast-growing economies or are rich in resources. They can typically be characterised by rapid urbanisation, a significant rise of a middle class population, growing demand for energy and resources or huge investments in infrastructure construction.

Regarding our approach for HGRs, we have a strategy named East-for-East where we are highly active in key markets such as India and China, meeting their needs with locally developed innovations. The next stage of our strategy, East-to-Rest, then prepares these technologies for export to other markets served by Honeywell.

DSA: **Making in India for export is also gaining credence because of cheap labour, stable political and socio-economic environment and pro-business and industry policies of the Modi government. How does your company plan to use this opportunity to further strengthen cooperation and collaboration with India?**

ARIJIT GHOSH
President, Honeywell Aerospace – India

Arijit Ghosh: Honeywell is dedicated to supporting the Indian military by bringing its leadership in engine technology, unmanned aerial vehicles, navigation and helicopter safety to help the country safeguard assets, lower operational costs and increase mission success. The company's Defence and Space business is also exploring opportunities beyond aviation with the Indian Space Research Organisation.

One of Honeywell Aerospace's biggest partners in India is Hindustan Aeronautics Limited (HAL). More than 40 years ago, Honeywell collaborated with HAL to manufacture the Honeywell TPE331 turboprop engine, the first engine fully manufactured in India. The engine powers the *Dornier 228* aircraft, which among other things is operated by the Indian Navy and Coast Guard. That collaboration has now expanded to include other indigenous HAL platforms such as the Advanced Light Utility Helicopter and Light Combat Aircraft, on which Honeywell systems and subsystems are key components. Honeywell has also licensed its *Primus 500* weather radar to HAL.

In addition to HAL, Honeywell has an important relationship with the Tata Group. In 2014, Honeywell Turbo Technologies announced a partnership with Tata to develop the first turbocharged petrol car engine that is locally engineered in India. The Tata Revotron 1.2T engine launched in the 2014 Tata *Zest* sedan delivers best-in-class power and torque and a first-in-segment multi-drive mode.

Also announced this year, Honeywell and Tata Power SED are collaborating on the co-production of Honeywell's TALIN inertial land navigation technology to offer the Indian Armed Forces a locally produced, inertial navigation system for the first time. We expect the combination of our technical heritage and Tata Power SED's ability to execute locally will deliver an extremely competitive and attractive proposition for India.

HINDUSTAN SHIPYARD LIMITED

Defence and Security Alert: **'Make in India' has created a buzz around the world attracting big players in defence manufacturing to the burgeoning Indian market. How do you think 'Make in India' will accelerate the creation of a Military Industrial Complex in India?**

Rear Adm NK Mishra (Retd): As I see it, the slogan 'Make in India' is an abbreviated vision statement, intended to bring into focus the manufacturing sector, which has not been given its due all these years of economic reforms. However, such a vision needs to be translated into a robust policy framework that would provide a boost to the growth of manufacturing sector.

Now, within the manufacturing sector, there undoubtedly is a great potential for developing the defence industry. India cannot afford to occupy the unenviable position of the biggest arms importer of the world, for long. Hence, I do believe and sincerely hope, that the renewed thrust being given to indigenous manufacturing under the programme of 'Make in India' would usher in a new vigour to our military industrial capabilities.

DSA: **Your company makes products of critical importance for Indian defence forces. How do you propose to align your future plans with 'Make in India' campaign?**

Rear Adm NK Mishra (Retd): We have traditionally been a partner for the government, as well as for the other companies in the maritime sector, in their efforts to develop the indigenous shipbuilding industry. Unfortunately, we as a nation failed to emulate the success stories of other shipbuilding nations of the world such as Japan, South Korea, Singapore and now China, in spite of adequate domestic demand for ships and other marine platforms.

HSL was transferred under the control of the Ministry of Defence in the year 2010, with the primary aim of building strategic platforms for the Indian Navy. However, such a major shift in the business strategy was not followed up with orders for vessels of significant value. In the bargain, HSL lost out on its commercial shipbuilding market as well. Thus, presently we are facing a serious crisis for survival. However, we hope that the MoD is seized of the matter to revive the yard by nominating HSL for certain complex high value projects such as the SoVs, Landing Platform Docks and advanced submarines. The unique locational advantage and long experience in warship building and major refits, places HSL in an advantageous position to take on these challenges, should the government decide so.

Of course, we, or for that matter anybody else in the public or private sector, do not have all the necessary capabilities for taking on the design and building of these vessels without any support from a foreign collaborator. HSL's strategy would be to restrict such external assistance to the bare essential level, leveraging at the same time its own strengths as well as that of other willing collaborators within the country, towards realising the true spirit of 'Make in India'.

DSA: **The Indian Industry has long been complaining about the absence of a level playing field *vis-a-vis* the Defence PSUs and the Ordnance Factories? Considering that these entities cannot be wished away, what can the government do to synergise the strength of the Defence PSUs and the Indian industry, including SMEs and MSMEs?**

Rear Adm NK Mishra (Retd): I agree with the observation that there is an absence of a level playing field between the Indian industry and the DPSUs, but I do not agree with the statement that the odds are always in favour of the DPSUs. Quite the contrary, more often than not we find ourselves constrained by several regulatory factors whenever we are to compete openly with the private industry: be it business development, strategic partnerships, mobilisation of resources, wage policies, exit policy etc. As a result, our costs tend to be higher than that of the private industries and hence it is unfair to ask the PSUs to compete with the private industries in a free-for-all market environment.

Having said that, I also see scope for collaboration and partnership between the DPSUs and the private players. The strength of DPSUs lies in their vast infrastructure and expertise accumulated over decades of warship building experience. Coupled with the efficient administrative processes, latest business practices and modern technologies that the private industries could offer, will definitely work to mutual benefit and in turn towards realising the common goal of building a credible and sustainable military industrial complex in India.

As for the SMEs and MSMEs, it is inevitable that an ecosystem of ancillary industries grows around a shipyard, without which it is unviable for it to exist.

DSA: **Co-development and co-production are the new catch phrases in defence manufacturing in India. How do these figure in your scheme of things and what kind of commitment is your company making to India's defence and security needs?**

Rear Adm NK Mishra (Retd): As I mentioned earlier, at least in the case of defence shipbuilding, no single shipyard has at its disposal all the resources that are required to build a state-of-the-art warship or submarine, all by itself. Each has its own strengths and weaknesses. The unique strengths of one could complement the weaknesses of the other, through co-development and co-production. Such a philosophy has been broadly factored in the major programmes that we expect to enter into, in the near future. We have been the designated DPSU for the co-production of LPDs, along with the successful private bidder. We are about to conclude a consortium agreement with MIDHANI and BHEL in preparation for the P-75(I) programme. We are also looking at other possible avenues for joint working with private partners.

DSA: **As you have seen, the new government's Defence Acquisition Council has been hyperactive in clearing mega projects. What new products and technologies is your company offering to our defence forces?**

Rear Adm NK Mishra (Retd): We in the defence shipbuilding sector are buoyed by the announcement of in principle approvals for certain big-ticket programmes like P-75(I). At the same time, we are concerned about the unduly long delays in translating these decisions into acquisition actions like issue of RFPs. As for the new products and technologies on offer to our defence forces, it needs to be understood that the shipyards in India do not operate on the philosophy of 'make-to-sell' but 'make-to-order'. Hence, once the MoD decides on the broad requirements of the ship or submarine it is looking for, we shall work towards developing the design indigenously if feasible or with the assistance of a foreign collaborator, if inescapable.

DSA: **Making in India for export is also gaining credence because of cheap labour, stable political and socio-economic environment and pro-business and industry policies of the present government. How does your company plan to use this opportunity to make India a hub of defence manufacturing for export?**

Rear Adm NK Mishra (Retd): As far as defence shipbuilding is concerned, in my view, our priority should be to minimise the current dependence on foreign acquisitions, rather than catering for a foreign market. First of all, we are a long way off in developing and producing state-of-the-art defence equipment matching the standards of established suppliers in the industrialised countries. Secondly, margins on shipbuilding *per se* are not so much, given the not-so-conducive tax, subsidy and duty regimes prevailing at present in India. Hence, export purely for commercial gains has to wait for sometime till Indian defence shipbuilding matures to a higher level of indigenisation. Of course, there is always scope for exporting to friendly maritime nations with the aim of strengthening our diplomatic relations.

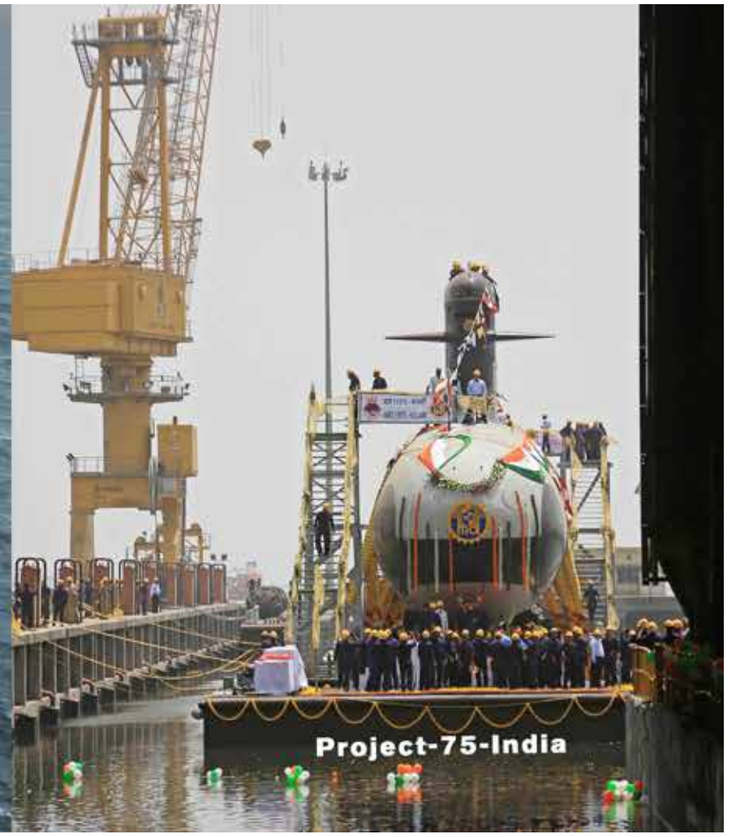
REAR ADM NK MISHRA
NM, IN (RETD)
CMD
Hindustan Shipyard Limited

DSA: **In pursuance of the recommendations of the Kelkar Committee, MoD had identified some Indian industries for being designated as the *Raksha Udyog Ratna*. However, the idea was shelved at the last moment a few years back. Why was it shelved? Would you say that there is a case for reviving that plan? What will be the advantages especially in the context of 'Make in India'?**

Rear Adm NK Mishra (Retd): I am not in a position to answer the question 'why the recommendations of the Kelkar Committee were shelved?'. However, I think that there definitely is a case to institute such a scheme for any industry that is serving the strategic needs of the country. As I said before, strategic defence procurements cannot be dictated by market principles alone. The British have learned this lesson the hard way. These industries need special consideration due to the specific nature of the business: requirement of huge resources, mobilisation of highly skilled people, long gestation periods for design and development, fluctuating demand etc. As brought out by the Parliamentary Standing Committee on Defence in their Sixth report to the Lok Sabha, these industries must be nurtured and sustained as long as they fulfil the requirements of the Armed Forces, even if at times they book losses. This is imperative to achieve the goal of 'Make in India', in the long-term.

DSA: **Considering that there are serious limitations on how much the government can spend on defence, could availability of funds be a constraining factor for the Indian industry to invest in defence production given the fact that there is no assurance of the purchase orders from the MoD?**

Rear Adm NK Mishra (Retd): Certainly. Defence production, warship building in particular, requires huge capital investment including nurturing and sustaining large pool of specialised people. It does not make good business sense to invest money in such ventures unless there is an assurance of orders. In fact, some of the big private shipyards have burned their fingers by doing so during the short-lived shipping boom prior to the economic recession of 2008. As a result, we now witness a mad race for grabbing any order from MoD, howsoever small in value, at rock-bottom prices, much to the chagrin of the DPSUs.



INDIAN NAVY'S 'MAKE IN INDIA' MANTRA

The Indian Navy has exhibited its commitment to harness indigenous technological capability and human skills to develop a modern Navy. It is hoping that the 'Make in India' programme will help it to meet the challenges of the 21st century. It is fair to say that the DRDO would have to re-engineer itself to meet the needs of the Indian Navy through indigenous development of technologies or through partnerships with both Indian and foreign collaborators.

'Make in India' is the *mantra* of the new government in Delhi. It seeks creation of 'physical infrastructure' and 'digital network for making India a hub for global manufacturing of goods ranging from cars to software and satellites to submarines'. In the military domain, the thrust is on transforming the military industrial complex (MIC) by capturing the indigenous technological prowess and human skills. At another level, 'Make in India' is an attempt to acquire 'unique and transformational' technologies from overseas as a 'systemic' measure to improve the Indian MIC to produce modern weapons and sensors and meet the demands of armed forces. It is hoped that 'Make in India' would result in a strong pool of trained human resource for the full spectrum of civil-military production.

The Indian Navy has internalised 'Make in India' campaign and the naval chief has been quoted saying that the Indian Navy's "blueprint revolves around the Make in India concept". There are 41 ships and submarines under various stages of construction and fitting-out at various public and private owned Indian shipyards and Indian Navy has not placed any orders for warships with foreign shipyards. The Indian Navy has also sought 'support of organisations like Defence Research and Development Organisation and BEL to achieve this'.

Dr Vijay Sakhuja
The writer is Director, National Maritime Foundation, New Delhi.

Build Or Buy Debate

It is true that 'Make in India' is not new to the Indian Navy; it adopted 'indigenisation' as its *mantra* several decades ago after experience of technology denial which necessitated a surge in the indigenous technology-building momentum. As a result, naval technology development in India has been quite impressive with strong accents on expansion of the existing naval industrial infrastructure as also opening up of the naval industrial complex to foreign technologies. Licensed production of the British *Leander* class frigates and import substitution from Russia, Israel, US and other European defence industry giants were short-term remedies and these acquisitions paved the way for development of indigenous technological strengths. However the scope of these remains limited because the ability to translate these technologies into large-scale assembly production is still limited.

'Make in India' is not new to the Indian Navy; it adopted 'indigenisation' as its mantra several decades ago

In India, 'hybridisation' of platforms has been a successful avenue of technology enrichment and integration of indigenously produced platforms and systems with imported sensors and weapons. In evidence are a number of good examples of the rugged Soviet /Russian military hardware fitted on-board indigenous and Western design platforms and systems to enhance the combat and operational efficiency of the Indian Navy. However, India has to contend with technologically superior Western military-industrial powers that have the technological lead over the developing world. The ability of this group to effectively stifle the technological growth trajectory of India through sanctions presents a major dilemma.

Harnessing COTS And Skill Development

The Indian Navy's strategy aims to harness Commercial off-the-shelf (COTS) Technology towards 'self-reliance through indigenisation' and it has relied heavily on in-house capability in system engineering and software development. It has also tapped the resources of the highly talented Indian IT industry. For instance, services of domestic Indian IT companies like Satyam Technologies and Tata Consultancy Services have helped developing software for the Navy's in-house information warfare systems. The Confederation of Indian Industry (CII) has acted as a catalyst to foster a long-term Indian Navy-industry partnership that lays ground for a joint working and co-development of naval systems and applications. These initiatives have led to strategic alliances with leading industrial houses in terms of technology transfer as well as resource sharing among personnel. For instance, the Weapons and Electronic System Engineering Establishment (WESEE) of the Indian Navy and various Indian Institutes of Technology (IITs) are good examples.

India has abundance of trained human resource in the civil domain. A number of initiatives to develop skilled workforce for warship building have been started. For instance, the CII and the Goa Shipyard Limited (GSL) are planning to sign an MoU to 'map and develop the required skill sets for the warship building industry'. The focus is on preparing skilled human resource for naval warship engineering for the construction of Mine Counter Measure Vessels being built by the shipyard.

Foreign Military Cooperation

Since independence, a number of foreign military hardware producers have engaged the Indian armed forces. Among these, Russia, the United States, Israel and some European defence companies are in the lead and are exploring supply of military hardware under the 'Make in India' programme. Perhaps, Russia was the forerunner in this direction. The two sides, while engaging in simple buyer-seller relationship, graduated to joint research, development and production of military equipment. One of the success stories of their collaboration is the development and production of the supersonic *BrahMos* cruise missile. The joint venture called BrahMos Aerospace is between the Defence Research and Development Organisation, India and Federal State Unitary Enterprise 'NPO Mashinostroyenia' (NPOM), Russia. The success of the BrahMos project provided the necessary impetus to both sides to explore newer vistas for joint design and development of other military hardware such as the fifth generation fighter aircraft (FGFA).

Interestingly, Indian entrepreneurs too have emerged as important stakeholders in the India-Russia military cooperation. In 1995, Krasny Marine Services Pvt Ltd (KMS) was established to render customised technical and logistic support to the Indian Navy, Indian Coast Guard, public sector shipyards and Defence Research and Development Organisation. The agency is manned and managed exclusively by officers and technicians retired from the Indian Navy and defence shipyards. In 1998, KMS established its avionics division at Goa for repair and servicing of Russian origin aircraft and became the first Indian company to be accredited by the Centre for Military Airworthiness and Certification (CEMILAC).

The success of the BrahMos project provided the necessary impetus to explore newer vistas

Shift Towards America

In recent times, India has turned to the US and is leveraging the two-decade long bilateral defence cooperation and, graduate from a buyer-seller relationship to a higher plane involving co-development and joint production. Significantly, the US has responded favourably and India has decided to position the Defence Technology and Trade Initiative (DTTI) high on the agenda. The US companies are keen to 'partner more closely with Indian industry' and engage the extensive 'manufacturing, research, engineering and knowledge base' to make the DTTI a successful initiative. It has identified 17 'transformative defence technologies', such as helicopters, UAVs and naval guns – for joint ventures. The Indian side is equally excited and the Secretary for Defence Production has stated "The DTTI is a very young framework ... We have never co-developed and co-produced anything with the US before. Even if we are beginning on a modest scale, it can graduate to more sophisticated levels". India hopes to participate and partake from the immense technological edge of the US.

Similarly, European shipbuilders have demonstrated their ability to work with Indian shipyards and produce submarines. For instance, four HDW type 209/1500 boats of German origin (two submarines of the series were built by HDW, Germany and the remaining two were assembled at the Mazagon Dockyard in Mumbai) and the ongoing construction of the French *Scorpene* class submarines are good examples of the ability of European shipbuilders to work with Indian shipyards.

Future of 'Make in India'

The focus of the new government is on 'Make in India'; however there remain a number of challenges. The Indian shipyards are proficient in making hulls based on Indian and foreign designs (aircraft carrier *Vikrant*, nuclear submarine *Arihant*, *Delhi* and *Kolkata* class destroyers, *Shivalik* class frigates and host of other classes of corvettes and patrol boats) and these have resulted in nearly "90 per cent indigenisation in the 'float' (hull, superstructure) component of a warship through the development of high-grade steel by DRDO and SAIL"; but the propulsion (move) and weapons, sensors and systems suites (fight) are still imported and 'lag behind at 50-60 per cent and 30 per cent, respectively'.

There are two mega-shipbuilding projects for the Indian Navy which are under active consideration by the government. First, there are plans to acquire six new-generation stealth submarines under Project-75-India (with land-attack missile capabilities and air-independent propulsion) which is estimated to cost over ₹ 50,000 crore. It is reported that an Indian shipyard with foreign collaboration will undertake the project. Second, the Indian Navy has an ambitious plan to acquire another aircraft carrier and it has been reported that a 65,000-tonne carrier (presumably *INS Vishal)* is under consideration and the Indian Navy chief stated that the "project report (being prepared by the Navy) has to be very thorough ... it cannot be a hasty job. We are also looking at nuclear propulsion but nothing has been frozen yet ... The report will be submitted to the government soon. We would like to leverage the country's shipbuilding capability, both in the private and public sector, for this very important project".

The above projects are surely going to be the test cases for Indian shipbuilding industry under the 'Make in India' programme to make India a world-class warship building nation. These will require a high-level of system engineering, human skills, expertise and infrastructure to ensure fruition.

The Indian Navy has exhibited its commitment to harness indigenous technological capability and human skills to develop a modern Navy. It is hoping that the 'Make in India' programme will help it to meet the challenges of the 21st century. It is fair to say that the DRDO would have to re-engineer itself to meet the needs of the Indian Navy though indigenous development of technologies or through partnerships with both Indian and foreign collaborators. DSA

ASHOK LEYLAND

NITIN SETH
Executive Director
Head, Global Truck Business
Ashok Leyland

Defence and Security Alert: **'Make in India' has created a buzz around the world attracting big players in defence manufacturing to the burgeoning Indian market. How do you think 'Make in India' will accelerate the creation of a Military Industrial Complex in India?**

Nitin Seth: 'Make in India' is aimed at creating business environment to attract investment in manufacturing sector in India. Defence sector can act as a catalyst to create jobs since India imports 60-70 per cent of its military equipment. In order to attract investment, Government has to create a level playing field for private sector. There is need to create hundreds of SMEs, who can create niche products for Defence sector.

DSA: **Your company makes products of critical importance for Indian defence forces. How do you propose to align your future plans with 'Make in India' campaign?**

Nitin Seth: Ashok Leyland is the largest Logistics vehicle supplier to Indian Armed forces. More than 70,000 Stallion Vehicles are operating successfully with Armed forces. Most of these vehicles have been delivered through our partnership with Vehicle Factory, Jabalpur (VFJ). We have been supplying Stallion kits to VFJ for assembling the vehicles for Army. This collaboration with MoD will be enhanced further in future by making higher capacity vehicles/applications jointly and will reduce dependence on imports.

DSA: **The Indian industry has long been complaining about the absence of a level playing field *vis-a-vis* the Defence PSUs and the Ordnance Factories? Considering that these entities cannot be wished away, what can the government do to synergise the strength of the Defence PSUs and the Indian industry, including the SMEs and MSMEs?**

Nitin Seth: Point 2 shows a Private-Government Partnership can work successfully. A Level playing field is required to address several issues on taxes, duties, delay in payment and so on. Private companies have to raise funds for development of components hence Defence sector should be treated on par with Infrastructure sector to get low cost financing, which will make them competitive.

DSA: **As you have seen, the new government's Defence Acquisition Council has been hyperactive in clearing mega projects. What new products and technologies is your company offering to our defence forces?**

Nitin Seth: AL has remained in Vehicle development area only but we are working on new technologies in Vehicle domain.

DSA: **Co-development and co-production are the new catch phrases in defence manufacturing in India. How do these figure in your scheme of things and what kind of commitment is your company making to India's defence and security needs?**

Nitin Seth: Co-development is the way forward, for example AL has relationship with OFB in Government (for Stallion) and L&T and Bharat Forge in Private for many projects. Similarly DPSUs should be allowed to choose their partners in India for Co-development for improving their efficiency.

DSA: **Making in India for export is also gaining credence because of cheap labour, stable political and socio-economic environment and pro-business and industry policies of the Modi government. How does your company plan to use this opportunity to make India a hub of defence manufacturing for export?**

Nitin Seth: Indian Defence Exports are minimal, AL exports Defence vehicles to African Armies for peacekeeping mission forces. India has potential to become global manufacturing hub. Government has to formulate industry friendly export policy to make in India a grand success. The current export control regime requires EUC and NOC which is very restrictive.

DSA: **Considering that there are serious limitations on how much the government can spend on defence, could availability of funds be a constraining factor for the Indian industry to invest in defence production given the fact that there is no assurance of the purchase orders from the MoD?**

Nitin Seth: Private companies have to raise funds for development of components hence Defence sector should be treated on par with Infrastructure sector to get low-cost financing, which will make them competitive. DSA

DEFENCE R&D FOR SELF-RELIANCE

Both the Indian Army and the Air Force should study the Navy's approach and initiate steps towards reviving these crucial in-house R&D capabilities soon. This would form a critical element of preparedness and lead to a more knowledgeable, self-sufficient and sustainable growth pattern for the technological progress of the forces which is the key to future success.

Research is the foundation of any industry and this is true for defence as well. The *man-machine combination* is the winning factor in battles and therefore research in defence is specifically focused to cater to this requirement. Soldiers, sailors and airmen have to be ready to fight a war with enemies who are well prepared and carry modern weapons, in the most extreme and demanding of conditions. This includes the oxygen deficient rarefied atmosphere of high altitudes, temperatures ranging from -40° to +50°C, rain, snow, blizzard, dust storms; space confined working environments like those found in submarines and spacecraft, zero gravity and 8-10g conditions which a fighter pilot or an astronaut are subjected to and other life-threatening hazards. These environmental factors that influence the soldier's performance have to be studied in detail so that the ill effects of long duration exposure to such conditions can be minimised, his survivability enhanced and the capability to make quick, sound decisions on the stressful battlefield is not compromised.

Users 'Hands-on' Experiences

The soldiers' experience is a key input towards making a better soldier and a superior military force. This is why it is seen that soldiers take part in the research and development programmes of their militaries. In the 1940s America's 'Manhattan' project which led to the development of the first nuclear weapon was headed by Maj Gen Leslie Groves. Scientific and engineering R&D was done by a team of civilians under Dr J Robert Oppenheimer, who was later known as the 'father of the atomic bomb'. During the 80s their 'Star Wars' project was headed by Lt Gen James Alan Abrahamson. In our own set-up Lt Gen SG Payara, a well-respected artillery officer with long DRDO service was the last military CC R&D whose views were taken seriously. He retired in the early 80s. Subsequently no Service officers were appointed as heads of weapons development projects or defence industrial units and at the decision-making levels within DRDO, except perhaps for naval projects. The civilian scientists work for the military and the nation towards giving the best possible weapons to its soldiers. This is the pattern followed the world over.

Defence R&D Across The Globe

Defence research covers the full spectrum of science and engineering and is classified as: 1) Basic Research, 2) Applied Research and 3) Development. Although the lion's share of finances and effort goes into development, it is basic and applied research that thinks afresh and invents the new. This is an area we cannot afford to neglect if we are to progress towards a self-reliant military.

Countries have different approaches towards their National Defence and their short and long-term weapons development and procurement policies. Basically it depends upon their threat perception, population, land mass, economic and technological status. In addition a non-partisan, stable and sustained political backing is essential to nurture a strong and mature military force. For our analysis a few countries are examined and grouped as under:

Industrialised developed countries. Britain, France, Germany, Italy, Sweden and Japan. These countries have their own weapon systems as finance, technology and human skills are readily available.

Oil rich countries. Saudi Arabia, UAE and Kuwait. Technology and skilled manpower are in short supply locally but since finance is no problem they buy the best equipment available.

Small but smart countries. Israel, South Korea and Singapore apply their limited resources with precision and efficiency. Israel spends four per cent of its GDP on defence and has the world's highest ratio of people to total population engaged in high-tech R&D. The research quality and density has enabled them to produce some of the most sophisticated weapon systems available and establish an advanced defence industry in less than 60 years.

The soldiers' experience is a key input towards making a better soldier and a superior military force

Terror/war-torn countries. Yemen, Iraq, Syria, Afghanistan etc.

Russia and China. The collapse of the USSR in 1991 put an end to the cold war and an unhealthy arms race. However loss of super power status did not affect the Russian defence and aerospace industries. They may not be maintaining the earlier tempo but one has to say that they are doing well on almost all fronts. Russian military technology is on a par with the best the West has to offer and perhaps superior in some cases. China on the other hand is thinking big and aiming high to occupy the number one slot sooner or later. They have reorganised their military technical set-up for the 21st century and are spending huge sums on upgrading their science and technology infrastructure to catch up with USA. Systematic planning and implementation of defence R&D programmes with a clear vision has been in progress for well over two decades and is now yielding impressive results.

Lone super power USA. America has been maintaining a lead in defence R&D right from WW II and the DoD's support for R&D is unwavering, long-sighted and determined to provide the best for its soldiers. The US Army has always kept a tight control over its R&D programmes. Their approach has been flexible, continuously evolving, trying out newer and better organisational structures for improving the administration of these activities with in-house research groups in partnership with leading industrial units and academic institutions. They had a Technical Corps since WW II which in 1962 became the Army Material Command (AMC), headed by a Lt General; by 1986, Laboratory Command (LABCOM) was created under AMC and in 1992 the Army Research Laboratory (ARL) was constituted. By this time AMC was headed by a 4 star General. Similarly, the US Navy, Air Force and Marines have their own research facilities. Thus from the 50s onwards one can see organisational changes taking place frequently in response to geopolitical transformations and rapid technological advancements.

It is felt that the subject 'How the US, Russian, Chinese and Israeli military manage their R&D' should be introduced at the Defence Services Staff College, Wellington, Tamil Nadu soon. This will enable our future commanders to understand how we can most effectively participate in jointly managing DRDO and defence industries to nurture top-grade military engineers and scientists.

Military Research In India

While it is a known fact that the bulk of all scientific and engineering R&D is undertaken by civilians on behalf of the military, it is also evident that all major militaries of the world initiate and control their weapons development projects and allied research programmes. India remains an anomaly in this aspect with the exception of our Navy. They have created a *Design Group* and an *Indigenisation Cell* that enables them to identify, specify, build and equip themselves with exactly what they require. Both the Indian Army and the Air Force should study the Navy's approach

Col AG Thomas (Retd)

The writer was commissioned in EME prior to the 1971 War and later seconded to DRDO. He served DRDO for 22 years in various capacities in different establishments. He was posted to the HCI, London in a diplomatic assignment as Deputy Technical Adviser (Defence) – accredited to most West European countries and USA. Subsequently he was posted at CVRDE, Avadi and also as Registrar Academics and head of General Staff (GS) branch at the Institute of Armament Technology (IAT), Pune, India.

and initiate steps towards reviving these crucial in-house R&D capabilities soon. This would form a critical element of preparedness and lead to a more knowledgeable, self-sufficient and sustainable growth pattern for the technological progress of the forces which is the key to future success.

Not all types of research can be outsourced to contractors as there are several areas of military research that are highly specialised for which there may not be an adequate aptitude outside of the military or even an interest in the private sector or academia. And certain studies are classified that need to be undertaken internally. Hence the three Services must articulate a combined *Military S&T doctrine* that encapsulates their research interests and identifies the requisite facilities that they will need to conduct such research activities that are of a purely military value, to be managed by the soldiers themselves.

Upgrading DIAT

In order to achieve something big we have to 'think big' by integrating our strengths and resources. At present there is no unified central body to undertake conceptual thinking and studies in an academic sphere by the Armed Forces themselves. A vibrant defence industry has to have an in-depth R&D ecosystem; which is an amalgamation of credible S&T capabilities dovetailed with evolving threat perception analyses and geopolitical strategy. If we want to create a symbiotic link between operations and technology, the establishment of a national ***Military Science Academy*** is most pertinent at this point in time.

It is essential to put in place a model that works well in the Indian context

The Defence Institute of Advanced Technology (DIAT) located in Pune has been a prestigious postgraduate level armament engineering institute under MoD. In addition about 100 bright army officers were trained every year in the Technical Staff Officers Course (TSOC). Today we need military men and women as science and technology managers and strategists. DIAT is ideally suited to be upgraded to the aforementioned Military Science Academy since the existing academic infrastructure and environment will allow for a cost-effective transformation, with minimum time and disruption.

Hence DIAT's charter could be enlarged to serve the following (1) strategic technology think tank and an incubation centre for the bright scientific and engineering talent of our country, (2) monitor and coordinate weapons research activities, (3) conduct improved technical training and (4) knowledge repository of all technical information on the various weapon systems as we are starting a phase of large-scale domestic weapons production in collaboration with foreign arms manufacturers.

Excellence Through Specialisation

Synergy between the military, industry and academia is the basis for a productive and progressive military industrial complex. India now has several engineering and science colleges of high standard. In order to effectively harness this vast academic talent base, scale up defence R&D activity and improve quality, a reliable method would be to enhance focus by defining clear geographical zones to carry-out research on a few designated weapon systems/technologies. The identified colleges collaborate with the existing defence R&D facilities and leading industrial units in each region to work in only these specialised areas. This should, in time develop their expertise and mastery over these core subjects.

The coordination and scrutinising of the increased density of research activities will be a complex task. With a large number of participants both from private industry and academia, it is essential to put in place a model that works well in the Indian context. A similar educational/research nodal concept which has been in operation for more than two decades is the Inter University Centre for Astronomy and Astrophysics (IUCAA) an autonomous institution set-up in Pune by the University Grants Commission to promote nucleation and growth of active groups in astronomy and astrophysics at Indian universities. This is the result of the pioneering effort of world renowned astronomer and astrophysicist Dr Jayant Narlikar and team. They have successfully created and operate an administrative framework that facilitates nationwide and global collaboration to foster new talents in this field. The IUCAA aims to be a centre of excellence within the university sector for teaching, research and also popularising these subjects. Hence their experience and wisdom could be valuable in formulating a 'world-class' interconnected defence research ecosystem.

Conclusion

Defence R&D is still largely funded by governments and plays a critical role to guide the innovation culture and spirit of a particular nation. There are many revolutionary inventions like nuclear power, semiconductors, jet engines, radar, satellites, lasers, computers, Internet, advanced materials etc, that were developed for the military and only years later did it reach the civilian domain, totally transforming the world we live in. This comes from having long-range foresight and a strong determination to defend one's strategic interests at all costs by painstakingly realising the goals that have been set.

Technological superiority is an undeniable advantage to the military. The Indian approach to defence R&D must primarily chart a course to close the widening technology gap and carefully identify a few achievable targets which are of national importance by utilising forecasting methods and scenario analysis to minimise risk and maximise technology assimilation. Most importantly, we must deliver results within a reasonable period so as to ensure accountability for the investment. Only sincere, sustained and focused effort can ultimately create the 'state-of-the-art'. DSA

TATA POWER SED

Defence and Security Alert: **'Make in India' has created a buzz around the world attracting big players in defence manufacturing to the burgeoning Indian market. How do you think 'Make in India' will accelerate the creation of a Military Industrial Complex in India?**

Rahul Chaudhry: For long India has been dependent on foreign countries for its defence needs. Even after it was denied supply of spares and critical ammunition during war times due to sanctions we did not move swiftly towards developing our own defence technologies. Today, India is the largest importer of arms in the world and expected to remain so in the near future. This not just drains our foreign exchange reserves and thus creating stress on the Nation's current account balance but also, loses on opportunity to create millions of jobs as defence (manufacturing) has one of the highest multiplier effect in manufacturing domain. We must take inspiration from our neighbour, China who has turned itself from being the largest importer to one of the top ten exporter nations as far as defence equipment is concerned. However the key question is whether we read the Hon'ble PM's call of 'Make in India' as mere 'Manufacture in India' or as 'Design/Develop and Manufacture in India'. Even from purely job-creation perspective, it is crucial to note a Nasscom-Deloitte study deduction that suggested a multiplier effect on jobs in high technology industry is found to be 1:4 (1 job created in high-tech industry creates 4 more jobs in the supporting industry).

Developing a local industrial complex will provide the needed impetus to increasing the indigenous component/systems in Indian defence equipment and ultimately take India towards its dream of self-reliance and exports. However, this needs a favourable ecosystem from policy to access to technology to ample opportunity to develop the Military Industrial Complex in India.

DSA: **Your company makes products of critical importance for Indian defence forces. How do you propose to align your future plans with 'Make in India' campaign?**

Rahul Chaudhry: For close to four decades, Tata Power SED has partnered the Ministry of Defence (MoD), the Armed Forces, DPSUs and DRDO with development and supply of state-of-the-art subsystems. Tata Power SED has consistently harnessed cutting edge technology to fulfill its deep-rooted commitment to the Nation. Since the mid-80s, Tata Power SED also made a significant contribution to the Integrated Guided Missile Development initiatives of Dr APJ Abdul Kalam and has to its credit, the development and supply of *AKASH* Launchers (Army and Air Force versions), Missile Interface Units for *AGNI* Launcher, On-board Computers and Launcher Electrical Systems for *PRITHVI* Launcher and a host of other Ground Electronics support systems.

We have always kept our interest aligned with that of the Nation's, thus our Mission statement reflects the same "Engineer strategic systems for substantive self-reliance by harnessing our multi-disciplinary capabilities to create value for all stakeholders and partners". We consciously focus on 'know-why' and not just the 'know-how'. This we believe is the key to success through 'Make in India'.

Recently we have been down-selected as one of the development agencies in both Make Programmes that have been announced so far (Tactical Communication System and Battle Management System). We are proud to have been associated with the Make Programmes even before the 'Make in India' campaign was announced.

We have been investing substantially in developing capability and capacity (investing in new factory in Vemagal and SEZs in Karnataka) to cater for future needs. We believe that going forward, there will be more focus on developing technologies in India to meet the armed forces requirement and SED will play a huge part in realising the Nation's desire of being self-sufficient in defence industry.

DSA: **The Indian Industry had long been complaining about the absence of a level playing field *vis-à-vis* the Defence PSUs and the Ordnance Factories? Considering that these entities cannot be wished away, what can the government do to synergise the strength of the Defence PSUs and the Indian industry, including the SMEs and MSMEs?**

Rahul Chaudhry: Though the government has been proclaiming that they wanted to create a competent defence industrial base with strong participation of Private sector, things have not moved at the pace that we would have liked. Recently there have been changes brought out in the policies to create a level playing field for Private players such as withdrawal of tax exemptions to DPSUs and this is appreciated. However, a lot has been left to be desired. Despite the word at the highest level, nominations to DPSUs continue to be a reality. There are serious issues that plague the Private Industry with respect to DPSUs, such as Exchange Rate Variation on existing contract – DPSUs get it but not the Private sector or competing with OFB in Buy and Make (Indian) RFPs where the ToT and the entire capex is already funded by MoD while Private sector is expected to include it in the bid. With the existence of issues, it is near impossible for Private Industry to be competitive. Private Industry is always willing to compete, even if it is with DPSUs and OFBs – all we ask for is a level playing field while we compete. Competition should be encouraged and that will bring in the best efficiency in India as a nation.

In order to bring in small players in the ambit, we believe that there is a great need for Tierisation of the industry in so far as it contributes to an ecosystem that is broad-based and actively involves M/SMEs, but relies upon each enterprise to play its role according to its size, capacity to absorb risk liability and make enduring investments. M/SMEs have a large role to play to fill in the current vacuum for subsystem suppliers and component level manufacturers, a lack of which increases our reliance on foreign components and subsystems. Even if we can attain maturity in harnessing high technology via the above approach, the MSMEs would remain essential for creating a robust self-sustaining and self-reliant ecosystem for

RAHUL CHAUDHRY
CEO, Tata Power SED

indigenous defence production. Otherwise we will have to rely upon imports for smaller components, if not the main components and continue to expose ourselves to external supply chain risks.

DSA: Co-development and co-production are the new catch phrases in defence manufacturing in India. How do these figure in your scheme of things and what kind of commitment is your company making to India's defence and security needs?

Rahul Chaudhry: Co-development and co-production are important aspects of 'know-why' which is our *mantra* in Tata Power SED. Towards this, we are working with many Foreign OEMs on co-development and co-production in the areas of communication, inertial navigation systems *et al.* With the focus on 'know-why' coupled with Lifecycle Cost Approach, MoD can achieve its ambition of self-reliance.

While we are geared up to contribute to achieving the goal of self-reliance, one of our concerns is the budget constraints for Defence. Majority of the budget allocated is consumed as revenue expenditure while 93 per cent of Capital Expenditure will go towards already committed liabilities. This does not augur well for the ambitious acquisition plan laid out to modernise Indian defence forces. Co-development and co-production require large sums of investment and we are committed to these investments however, our Boards and Shareholders lack the confidence in the planned acquisition plan laid out by MoD.

DSA: As you have seen, the new government's Defence Acquisition Council has been hyperactive in clearing mega projects. What new products and technologies is your company offering to our defence forces?

Rahul Chaudhry: Tata Power SED has largely been a Land Systems company and had involvement in major programmes with MoD, the Armed Forces, DPSUs and DRDO in developing and supplying state-of-the-art subsystems. Tata Power SED today, provides comprehensive solutions in Strategic Engineering and Electronics of Embedding Intelligence in Sensors and Weapon Systems and has core competencies in Engineering and Packaging of large structural payloads for launch platforms to compact electronic units for airborne applications. We have indigenously developed almost 120 products with IP controlled totally by Tata Power SED. Some key technologies that we are already offering to Armed Forces are:

- Artillery Ballistics
- Robust and Real Time Software for Embedded Applications
- Rapid Prototyping and Simulation
- Development of advanced algorithms for Platform
- Servo Control, target Data Processing/Tracking /Fusion for Radars and other Sensors

Tata Power SED has state-of-the-art products and solution in the following areas for the Armed Forces:

- Weapon Systems
- Command, Control, Communication, Computing, Intelligence, Surveillance and Reconnaissance (C4ISR)
- Electronic Warfare
- Sensors
- Communication Systems

Our Division has the ability to understand defence requirements and design and manufacture to MIL Grade with requisite system reliability, documentation and long-term support needs. SEDs infrastructure includes customised Test Jigs, Fixtures and Simulators, Advanced Environmental Test Facilities covering EMI/EMC aspects, Systems Integration and Staging Facilities.

Success in modern war depends on integrated operations over distributed geographies using Sensors and Weapons of varying vintage. Tata Power SED's team has the right blend of technological and operational experience in integrating these heterogeneous systems, using both industry standard and system specific interfaces and protocols. The Division today is the premier private sector player for Strategic Engineering with integrated design-to-production capability and a proven track record of meeting Indian armed forces requirements for installation, commissioning and maintenance services.

DSA: Making in India for export is also gaining credence because of cheap labour, stable political and socio-economic environment and pro-business and industry policies of the Modi government. How does your company plan to use this opportunity to make India a hub of defence manufacturing for export?

Rahul Chaudhry: As discussed earlier, India is the largest importer of arms in the world; we import almost 70 per cent of our requirements. This not only drains our dollar reserves while giving the economic benefit of jobs and growth to foreign countries, but also makes our country vulnerable during war scenarios as we depend on supplies from foreign countries. Though the situation has improved, procurement has not been at the required pace due to myriad of issues ranging from cumbersome procedural delays to insufficient funds.

Each of these issues needs an urgent attention. Hon'ble Prime Minister has provided the country the right platform in the form of 'Make in India' while keeping Defence as one of the key areas to realise the maximum advantages for long-term economic and defence security for the country.

Though the intention and policy statements seem to have the heart in the right place, it's the environment that is not conducive enough to create any impact on the ground realities. Apart from addressing the above issue to create impetus in indegenisation, the focus should rather turn towards capturing high value in the value chain than mere low-end job creation. China recently had turned the table and is becoming one of the largest arms exporters from being the largest importer during 2006.

However, India should be mindful on the path it needs to take, if it wants to be self-sufficient and become a hub for export of defence technologies, it needs to participate higher up in the value chain and not go down the path of leveraging the labour arbitrage. For example, in spite of being responsible for final export of all Apple products to US, China only captures 1.6 and 1.8 per cent (of iPhone and iPad respectively) of the total value while with Design and Marketing Apple captures 58.5 and 32.5 per cent of the total value of iPhone and iPad respectively. Thus to become an international hub for exports, India should first build its capability in developing world-class defence systems that can compete at global platform.

Another critical requirement towards fulfilling our dream of Defence Exports is the ownership of IP by Indian Industry. This is critical not only for meeting the need of Long-term 'Life Cycle support' required by Defence Forces at a fraction of the costs that are being paid today to Foreign OEMs but also hedge against denial regimes that can suddenly reappear at time of war or if India wants to export Defence Equipment. It is also pertinent to note that the life cycle cost of equipment is typically 4-5 times the capital procurement cost. Hence the real value proposition of a MAKE Programme for Armed Forces is to reduce the Life cycle Cost (LCC) and also improve the availability of the equipment with better control on Spares and Subsystems. The above will also bring India close to its ambition of exporting 'Indian Defence Products'. These issues are intertwined with India's status of the emerging third largest economy in the world and our national ambition of having a seat in 'Security Council'.

DSA: In pursuance of the recommendations of the Kelkar Committee, MoD had identified some Indian industries for being designated as the *Raksha Udyog Ratna*. However, the idea was shelved at the last moment a few years back. Why was it shelved? Would you say that there is a case for reviving that plan? What will be the advantages, especially in the context of 'Make in India'?

Rahul Chaudhry: MoD should move towards tierising the Industry to facilitate quicker decision-making on down-selection of DAs. MoD should work towards creating Industry Champions for each area. Identifying Champions will be a one-time exercise and thereafter the EoI can be issued only to Champions. Industry Champions can be identified for both System Integration Platform level Programmes and Technology Champions for Technology/Niche Areas where MSMEs can also be a nominated Champion. In many Platform/SI Programmes, Technology Champions should be preferred partner of the Industry Champion. To maximise the participation of Indian Companies, MoD should allow 100 per cent-owned subsidiaries of Indian Companies to participate as Champions borrowing the Parent Company's financials.

Development and Production Orders should be expeditiously closed with the Industry Champions using the cost-plus model. This will not only be a faster process by cutting down on the bidding and evaluation time, but will also bring in more and more transparency between MoD and the Industry Champions. This will also serve right for the Armed Forces as they will get their equipment from the best-in-class Companies who are committed to deliver as per agreed quality and timelines (instead of L1 tendering philosophy which could easily lead into delays due to either lack of technical competence or execution excellence of the L1 bidder).

DSA: Considering that there are serious limitations on how much the government can spend on defence, could availability of funds be a constraining factor for the Indian Industry to invest in defence production given the fact that there is no assurance of the purchase orders from the MoD?

Rahul Chaudhry: Over the decades, since independence India's defence allocation has always stayed below the required level. Moreover, it has been in decline over the last five years in terms of percentage of GDP. The defence allocation has come down to 1.74 per cent of GDP in 2014-15 from 2.35 per cent of GDP in 2009-10. In 2015-16 budget the allocation has been around US$ 40 billion, a mere 7.7 per cent increase from last fiscal year.

Though India has been on the eighth spot for the share of world's highest military spending (2014), it is well below its neighbour China (which holds the second position). Moreover, majority of the budget allocated is consumed as revenue expenditure. In fact, this year, only ₹ 6,070 crore (~7 per cent) has been allocated for new items under capital acquisition while ₹ 71,336 crore will go towards already committed liabilities.

This does not augur well for the ambitious acquisition plan laid out to modernise Indian defence forces. However, recent push by the government for Make Programmes will give the required impetus to funding that the Private industry is looking for. For any major programmes, industry needs to invest in advance to develop systems and participate in NCNC (No cost No commitment) trials or down-selection phase (in MAKE Programmes) to prove its viability. Considering 5 to 7 years of procurement cycle and at least 2 years of development cycle prior to that, private industry needs to bear the cost of capital for almost a decade that too in a country which has one of the highest cost of capital in the world. This coupled with the inherent capital-intensive nature of defence industry makes the sector unviable for Industry unless a flow of guaranteed orders without much delay are assured. Defence skills are niche in terms of technology and can easily be utilised in export of services. I am afraid if procurements in defence sector are not expeditiously processed, neither will Armed Forces get the much-required equipment nor will Industry be able to hold the expensive capital (both, men and machines) for too long.DSA

BHARAT FORGE

KALYANI

Defence and Security Alert: **The defence sector was opened for the private sector in 2001 but a very small proportion of what MoD buys, comes from the private sector. What, in your opinion, are the reasons that account for this storyline? Is this scenario poised for a paradigm shift with the government's 'Make in India' initiative?**

Rajinder Bhatia: Indian Industry has taken rapid strides in the field of manufacturing and is competing with the best on the global platform. Today we have technologically advanced manufacturing capabilities, one which is driven by highly focused and skilled workforce. However, Defence Manufacturing in India is not aligned to the manufacturing capability existing in the country. We have great potential for manufacturing but majority of hardware is imported making our Nation vulnerable and net Importer of Security.

Opening of markets alone is not enough. It is more important for that market and environment to be made conducive for enabling active participation by private industry. The new government has shown the intent and we are hopeful that things will change in the years to come.

'Make in India' is definitely a right step which will help the government leverage the private industry as a strategic defence asset and become a full partner in its growth and modernisation plans. It is imperative that both the government and the Indian industry give full thrust to 'Make in India' and create a self-reliant Defence Industrial Base. A nation with a strong defence industry will not only be more secure, it will also reap rich economic benefits.

DSA: **How is this initiative conceptually different from the 'Make' procedure introduced by MoD in 2006? In your opinion, has the government formulated a sector-specific policy and evolved a new procedure to execute the 'Make in India' initiative in defence? If so, could you please elaborate and also tell us whether you are satisfied with the efficacy of the new sector-specific policy and the related procedure? If not, what, in your opinion, still needs to be done?**

Rajinder Bhatia: 'Make in India' and 'Make' are fundamentally different although they sound alike. With 'Make in India', the aim is to build best-in-class manufacturing infrastructure, enhance skill development and facilitate investment in the country. And the main aim of MAKE procedure is to create indigenous system level capability with majority government funding.

In the complex defence sector, it is very important that the two are appropriately amalgamated. Due efforts have been taken by the government on this aspect, but there still exist some gaps to be plugged. One of the immediate actions to kick-start the programmes under 'Make in India' would be to convert some of the ongoing programmes to 'Make in India' by encouraging foreign OEMs to establish joint ventures and set-up manufacturing plants in India.

DSA: **The Technology Perspective and Capability Roadmap of 2013 intended to sensitise the industry about the technologies and capabilities armed forces would require in the next fifteen years so that the industry could gear up itself for meeting the requirement. However, it did not play out the way it was expected to. What do you think is the reason? What kind of information would the industry need from MoD to be able to prepare itself to meet the requirement of the armed forces?**

Rajinder Bhatia: There are many reasons why the TPCR did not achieve what is was intended for:

- Most of the information in the document is too generic including technology specifications
- Ambiguity about time frames
- No indication of the likely numbers/quantity
- Lack of focus on upgradation, life extension of in-service equipment, maintenance, repair and overhaul activities
- Absence of an appropriate structure in the MoD to steer this exercise

TPCR will lead to results if this road map is converted into actionable programmes with the help of Indian industry.

DSA: **'Make in India' has created a buzz around the world attracting big players in defence manufacturing to the burgeoning Indian market. How do you think 'Make in India' will accelerate the creation of a Military Industrial Complex in India? Do you think the industrial ecosystem in India is conducive to defence manufacturing? If not, what are the major issues that need to be addressed by the government?**

Rajinder Bhatia: The government has also taken a slew of measures to improve investor confidence and attract new investments for example,

- creation of an investor facilitation cell
- reducing licensing/regulatory requirements in critical sectors like Defence
- improving overall ease of doing business; many states introducing single-window clearance mechanisms
- 14 Government of India services have been integrated with the eBiz portal

Particularly in the Defence sector, the government has:

- Increased FDI cap from 26 per cent to 49 per cent and thus encouraging Private companies to partner with foreign technology providers and bring capabilities to India
- Liberalised the Industrial Licensing and Streamlined the Exports Licensing Policy
- Initiated several 'Buy and Make (Indian)' programmes

Some more work towards operationalisation of policies is needed. But the intent definitely is good.

DSA: **Your company makes products of critical importance for India. How do you propose to align your future plans in India with 'Make in India' campaign?**

Rajinder Bhatia: The Kalyani group has always been at the forefront of technology and innovation. As a global engineering conglomerate, we have already taken 'Made in India' brand the world over with our products. In Defence sector too, we are the champions of indigenous manufacturing and have been 'Making in India' even before it became 'THE' buzz word for the country. Our 155/52 cal *Bharat-52,* is the first 100 per cent indigenously designed, developed and manufactured Artillery gun system by any private player in the country. *Garuda-105,* the light field gun with soft recoil technology is another stellar example of our 'Make in India' efforts.

In line with this campaign, our aim is to indigenise all the three aspects of any defence manufacturing: Design or technology, manufacturing capability and infrastructure and maintenance and life cycle support. We are also working on a number of joint ventures and strategic partnerships with world leaders in order to bring in the technology and undertake joint production and manufacturing in India.

DSA: **Co-development and co-production are the new catch phrases in defence manufacturing in India. How do these figure in your scheme of things and what kind of commitment is your company making to India?**

Rajinder Bhatia: Co-development and co-production are definitely the more pragmatic way forward owing to the sheer scale of the requirements of the Indian armed forces in terms of complexity and quantity. Kalyani Group also has been actively pursuing this route – joint development and production with all concerned players – Global OEMs, Indian industry and government agencies like ordnance factories, DRDO labs etc.

DSA: **As you have seen, the new government's Defence Acquisition Council has been hyperactive in clearing mega projects. What new products and technologies is your company offering to India?**

COL RS BHATIA (RETD)
President and CEO, Kalyani Group

Rajinder Bhatia: The Kalyani Group aims at designing and developing state-of-the-art, high quality military hardware using indigenous talent and innovation. We wish to present the country's armed forces with end to end indigenously developed technologies.

Some of the key areas are Land systems (Artillery guns including Mounted Gun system GS and Ultra-light Howitzer), Armoured fighting vehicles including protected vehicles, Ammunition (including niche products like precision ammunition, BMCS, FSAPDS), Missile Integration and Defence Electronics.

DSA: **Making in India for export is also gaining credence because of cheap labour, stable political and socio-economic environment and pro-business and industry policies of the Modi government. How does your company plan to use this opportunity to further strengthen cooperation and collaboration with India?**

Rajinder Bhatia: Many Indian companies have had considerable success in exports. Kalyani Group led by the Flagship Company Bharat Forge exports majority of its products to countries all over the world. This has been achieved not by labour arbitrage but on the back of strong innovation, world-class manufacturing and technology development.

The scenario for the Defence exports is slightly different. Foreign customers will look for track record and it is therefore imperative that the government creates ecosystem conducive for achieving breakthrough in our own country before we seek exports for our defence products. DSA

DASSAULT SYSTEMES

Defence and Security Alert: **The defence sector was opened for the private sector in 2001 but a very small proportion of what MoD buys, comes from the private sector. What, in your opinion, are the reasons that account for this storyline? Is this scenario poised for a paradigm shift with the government's 'Make in India' initiative?**

Dr Chandan Chowdhury: Defence sector was thrown open to private players in 2001 with a permitted 100 per cent equity and a maximum of 26 per cent FDI component, both subject to licensing. This was unattractive for many global OEMs for them to infuse money into the sector. As this sector has a very high cost entry barrier, very few Indian business houses have shown the interest. Hence, this sector has seen a lukewarm growth in past decade. However, this sector is poised to gain momentum with a spree of investor friendly initiatives launched by the government. Increased FDI to 49 per cent with 'Make in India' will radically change the industry landscape in the next decade.

DSA: **How is this initiative conceptually different from the 'Make' procedure introduced by MoD in 2006? In your opinion, has the government formulated a sector-specific policy and evolved a new procedure to execute the 'Make in India' initiative in defence? If so, could you please elaborate and also tell us whether you are satisfied with the efficacy of the new sector-specific policy and the related procedure? If not, what, in your opinion, still needs to be done?**

Dr Chowdhury: 'Make' procedure of Defence Procurement Procedure 2006 and 'Make in India' campaign have subtle ambiguities in their form. Current DPP pre-dates the current 'Make in India' initiative and may, therefore, not provide the answer to many new issues that have arisen as regards the role of the Indian industry and foreign companies/governments. This document mentions five procurement categories, which prioritise Indian organisations for defence programmes, whereas one of the key underpinnings of 'Make in India' is to attract foreign investors to set their shop in India, transfer the technology and produce it completely in India. Increase in FDI from 26 per cent to 49 per cent is one step towards inviting global OEMs; however, DPP needs to be more refined to address such ambiguities and encourage far bigger foreign investment in India.

DSA: **The Technology Perspective and Capability Roadmap of 2013 intended to sensitise the industry about the technologies and capabilities armed forces would require in the next fifteen years so that the industry could gear up itself for meeting the requirement. However, it did not play out the way it was expected to. What do you think is the reason? What kind of information would the industry need from MoD to be able to prepare itself to meet the requirement of the armed forces?**

Dr Chowdhury: While Technology Perspective and Capability Roadmap 2013 sensitised the required technologies for Indian armed forces, nowhere, the question of whether manufacturers, including Indian companies, can take the initiative to make something on their own volition or should they wait till the MoD comes out with a Request for Proposal (RFP), is answered. Manufacturing a product *suo motu* is fraught with the risk of being unable to sell it and there should be a procedural framework that offers to mitigate any such risk. Such futuristic technology research programmes are currently undertaken as technology demonstrator programmes at DRDO with the government funding and it would be encouraging if a similar methodology can be extended to manufacturing domain as well.

DSA: **'Make in India' has created a buzz around the world attracting big players in defence manufacturing to the burgeoning Indian market. How do you think 'Make in India' will accelerate the creation of a Military Industrial Complex in India? Do you think the industrial ecosystem in India is conducive to defence manufacturing? If not, what are the major issues that need to be addressed by the government?**

Dr Chowdhury: Make in India has created a buzz around indigenous manufacturing and set the stage for improving the contribution of manufacturing to the country's GDP. It is certainly the first but a baby step towards this grand vision of making India as 'world's factory'. However, we are confronted by many challenges; one of them being ramping up of our manufacturing industry at a time when many other economies in the neighbourhood have surplus production capacities in several industrial segments. Such competitive global environment for manufacturing can be overcome in two ways; one by serving the domestic needs without relying on foreign manufactures (Make for India) and second is to ride the wave of Industrial innovation. Industrial ecosystem in India is still in its infancy and requires a complete overhaul for it to cater to the grand vision and defence industry offers a great opportunity to better the situation from the grass-roots level. Some of the challenges that are pegged by the Indian defence industry are:

- How do we deliver project on time and on-quality
- How do we significantly reduce cycle of time of upcoming projects
- How do we build a robust ecosystem for successful delivery of high-quality defence programmes
- How do we reduce life cycle costs?

DSA: **Your company makes products of critical importance for India. How do you propose to align your future plans in India with 'Make in India' campaign?**

Dr Chowdhury: Dassault Systems has a wide presence in Indian defence industry with many of its flagship programmes such as LCA and *Arihant* are developed using our technology. With our rich legacy in aerospace and defence industry, we have pioneered the digital factory concept with many global aerospace OEMs, which we believe is of great significance for Indian industry.

DSA: **As you have seen, the new government's Defence Acquisition Council has been hyperactive in clearing mega projects. What new products and technologies is your company offering to India?**

Dr Chowdhury: It is a welcoming trend that the current government has fast tracked many pending projects to give the required impetus to dwindling armour of Indian armed forces. It not only improves our war readiness but also aids Make in India initiative. With so many programmes underway, embracing the technology in every walk of this initiative is of utmost importance.

To assist this massive transformation, we offer a unique technological framework that connects all stakeholders of Indian Aerospace and Defence industry on a virtual plateau, provides best practices and methodologies to minimise multiple designs, prototypes and test iterations typically required for product or process qualification, all connected via the digital thread and finally offers a secure and trusted infrastructure for the management of information assets in a highly collaborative manufacturing environment.

DSA: **Co-development and co-production are the new catch phrases in defence manufacturing in India. How do these figure in your scheme of things and what kind of commitment is your company making to India?**

Dr Chowdhury: We have a very big presence in India with approximately 16 per cent of our global workforce operating from India. Our operations in India cover R&D, services/implementation (global and local), post implementation support (global and local), consulting and sales.

We offer our solutions in many sectors (both in defence and civil) like Energy process and utility, Smart Grid, Smart City and 3DEXPERIENCity (3DEXPERIENCity: 3D Modelling the smart grids and sustainable cities of the future), Cyber intelligence and homeland security, Consumer packaged goods retail, Consumer goods retail, Marine and offshore, Natural resources (including mining), Life sciences (including pharma), Transportation and mobility (including automotive and railways), Aerospace and Defence, Industrial equipment, Architecture, engineering and construction, Financial and business services (including engineering services) and High-tech.

DR CHANDAN CHOWDHURY
Managing Director
Dassault Systemes India Pvt Ltd

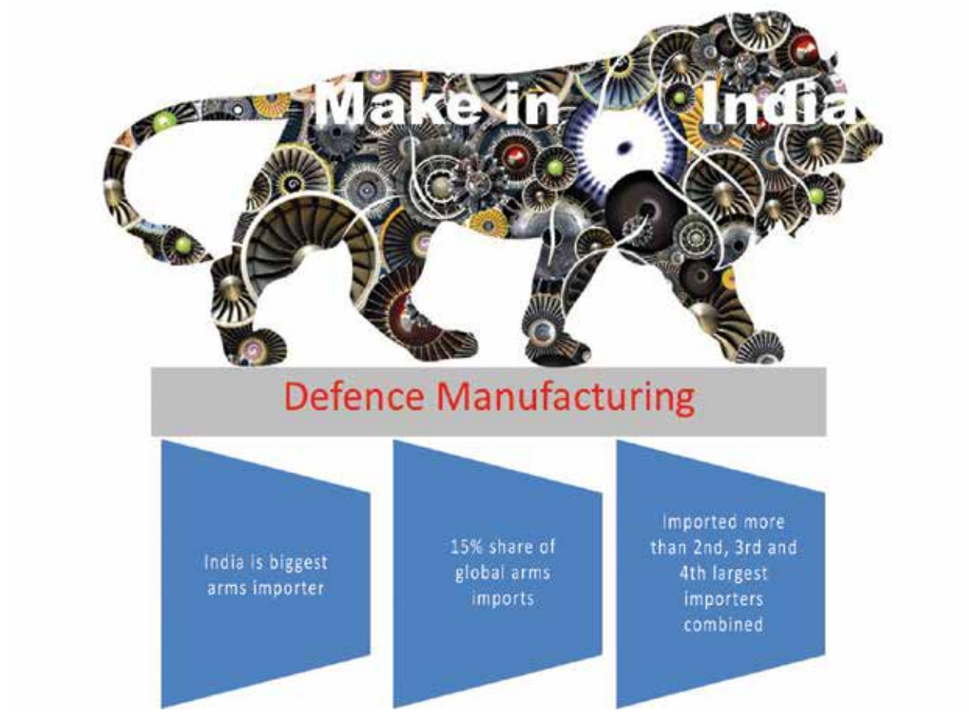
We rely on simulation to transform the world around us. I think we can make a big contribution to transform the Indian manufacturing sector and support sustainable innovation to make our country a better place to live in. Our applications can really convert government's vision of 'Make in India' into a realistic possibility.

DSA: **Making in India for export is also gaining credence because of cheap labour, stable political and socio-economic environment and pro-business and industry policies of the Modi government. How does your company plan to use this opportunity to further strengthen cooperation and collaboration with India?**

Dr Chowdhury: We believe that India will be a growth engine for many companies worldwide. Economic growth has stagnated in almost all developed nations and India is uniquely positioned to exploit this advantage. With its rich knowledge capital, India is rightly poised to emerge as manufacturing hub for many global companies. In few industries such as automotive, this trend has taken off during the last decade with many global giants setting up their plants in India. For our dream to become 'world's factory' India will have to ride the wave IIoT (Industrial Internet of Things) and our company is rightly positioned to offer this technology backbone, which we believe, would further strengthen our presence in India.

DECIPHERING THE CONCEPT

The 'Make in India' initiative requires a culture of trust between government and industry; an attitudinal change from the existing environment. Institutional mechanism is required to foster a culture of dialogue and consultations in the defence acquisition process itself, as a necessary prerequisite for building enhanced confidence and trust in MoD's procurement systems in the long run .... Therefore there is a need to adopt international best practices with an open mind to prepare and implement defence acquisition policy documents.



While it is quite sometime that Prime Minister Narendra Modi launched the 'Make in India' initiative in September 2014, there is still lack of clarity on what exactly 'Make in India' means in relation to defence production. The present Government has announced number of initiatives since it came to power, apparently prematurely, without adequately planning subsequent execution, coordination and resource allocation. While nobody expected immediate results but the question remains whether these initiatives were part of a well-thought-out national strategy or disjointed response to the inaction of the previous government. Since no such strategy or guidelines have been spelt out in respect of the 'Make in India' initiative in defence manufacturing, various stakeholders including foreign companies and governments have adopted a wait and watch attitude till clarity emerges.

The Moot Points

The first and foremost issue is as to how is it different from existing systems and procedures currently being followed by the MoD. Some of the questions nagging various stakeholders are:

- What does 'Make in India' in defence mean and how does it differ from existing procedures or how does it work in conjunction with them?
- How does one enter the Indian defence production market?
- What does the Indian or foreign manufacturer make in India?
- How do they sell it in India and abroad?

Existing Policy And Procedures

The following documents govern the defence procurement and manufacture:

- Defence Procurement Procedure (DPP) of 2013.
- Defence Production Policy of January 2011.
- Technology Perspective and Capability Roadmap (TPCR) of April 2013.

But these documents, which were formulated before PM's 'Make in India' initiative, do not provide clear answers to the nagging questions. The focus of these policy documents was on meeting the requirement of the armed forces through outright purchase whether as 'Buy Indian', 'Buy and Make', 'Make' or 'Buy Global'. The existing categories for procurement can be analysed to correlate them with respect to the 'Make in India' initiative.

Outright purchase, whether from Indian companies or foreign original equipment manufacturers, is not what 'Make in India' aims at, despite the fact that Buy (Indian) also involves an element of indigenous production.

Buy and Make (Indian) involves manufacturing in India but it is only through transfer of technology and, in any case, the main players in this category of cases are Indian companies. Foreign companies play the lead role in Buy and Make cases but this is now the second last category in the priority of the procurement categories, followed only by Buy (Global) which involves no manufacturing in India.

The 'Make' category also, which comes closest to what 'Make in India' concept would seem to be, involves indigenous design and development of prototypes of complex systems. In this the lead role has to be played by Indian companies, although, of necessity, they will have to tie-up with foreign manufacturers. In the past decade since this category was introduced, no project has taken off the ground so far. The only project initiated was the Future Infantry Combat Vehicles which too was called off later.

The focus of the existing policy documents is to encourage indigenisation while the 'Make in India' initiative appears to invite foreign manufacturers to set-up facilities in India and manufacture in India. Thus the stated aims of both policies are divergent and there is an urgent need to conceptualise and formulate a policy framework laying down what 'Make in India' implies so far as defence production is concerned and how does it work in relation to the existing policies.

What To Make?

This is another big question that is haunting the prospective military hardware manufacturers and sellers whether foreign or Indian, since the TPCR is quite vague about the future requirements. It has not quite succeeded in conveying to the industry the information for which it was formulated. Manufacture of military hardware is totally dependent on the users' requirement and lead time is required to develop and manufacture a system. How can one imagine manufacturers or sellers undertaking manufacture of equipment and systems which they are not sure of being purchased by the user? This is the root cause restraining greater participation by both Indian and foreign manufacturers in this initiative. Leave aside setting up manufacturing facilities, some foreign vendors do not even want to visit India and spend on travel till greater clarity emerges.

In such a scenario companies enter the fray only when the request for proposal is issued, except few enterprising ones which perhaps do take some advance action when request for information is issued indicating initiation of the procurement process. This certainly is not a happy situation, since the chances of the offered equipment, developed/integrated at short notice, to meet the Services Qualitative Requirement are that much reduced.

Make in India Website

The official 'Make in India' website gives little information to answer these questions as is apparent from the screenshot taken from the website.

The information displayed on the website leaves an impression that it has been hurriedly put together and lacks deliberate thought regarding implementation of policies. It appears to convey that the aim of the initiative is to invite foreign companies to undertake manufacturing in India. While this could be adequate to attract foreign companies to undertake manufacturing in other sectors but the concept needs to be customised

Col Sanjeev Dalal (Retd)

The writer has spent more than 26 years in Indian Army where he was in charge of Acquisitions in his last tenure. An alumnus of Defence Services Staff College, Wellington, he is a domain expert in Camouflage and Chemical Biological Radiological Nuclear (CBRN) Defence.

SECTOR POLICY

PROCUREMENT POLICY

→ The defence procurement is governed by the Defence Procurement Procedure (DPP). The government has now decided to revise the DPP every year.

OFFSET POLICY

→ The key objectives of the defence offset policy is to leverage capital acquisitions to develop the Indian defence industry. Mandatory offset requirements of a minimum of 30% for procurement of defence equipment in excess of INR 3 Billion have been envisaged.

GUIDELINES FOR ESTABLISHING JOINT VENTURE (JV) COMPANIES BY DEFENCE PSUS

→ A well laid out policy for formulation of joint venture between Defence PSUs and private sector keeping in view the objective of Defence Production Policy.

PROCEDURES FOR THE GRANT OF INDUSTRIAL LICENSES HAVE BEEN STREAMLINED

→ The initial validity period of industrial licenses has been increased to three years from the present two years.

→ Guidelines for the extension of validity of industrial licenses have been issued.

→ Partial commencement of production is treated as commencement of production of all the items included in the license.

for the defence sector keeping in mind the existing defence procurement and production policies. It is unlikely that foreign companies will find it irresistible to relocate their production units to India, in the hope that at some point in the future the MoD will buy what they are making and that, in the meantime, they could sustain themselves through exports. Same is applicable to Indian industry as well, before they commit sizeable investments into this initiative.

It is a great initiative in the right direction; it just needs to be channelised by means of appropriate policy formulation, coordination and clarity between the new initiative and existing procurement procedures. The recent decisions regarding *M 777* artillery guns, *Avro* aircraft replacement and light helicopter give hope to foreign and Indian manufacturers that the initiative will yield good results in future.

Long-term Strategy

Besides clarity on policy contradictions between the existing defence procurement procedures and the new initiative, there is need for greater coordination to formulate cogent strategy to take the programme of defence acquisitions and thus modernisation ahead in the desired manner and time frame. There is also a need for having a long-term strategy regarding major weapon platforms like aircraft rather than a piecemeal project-specific approach. Need is to develop technological capabilities in the country while acquiring a particular weapon system so that future requirements can be met indigenously. For example if one were to consider some of the various aircraft acquisition programmes the list would be very impressive:

- 56 transport aircraft to replace the *Avro* fleet
- 106 Swiss *Pilatus* basic trainer aircraft
- Intermediate Jet Trainer (IJT)
- Light Utility Helicopter (LUH) for the three Services
- Light Combat Aircraft (LCA) for the Navy and IAF
- Medium Multi-Role Combat Aircraft (MMRCA)
- Multi-Role Transport Aircraft (MTA)
- Fifth Generation Fighter Aircraft (FGFA)

A cogent strategy to implement 'Make in India' initiative keeping the array of aircraft (and similarly other systems) requirement in mind can yield far-reaching results in capability building while reducing import dependence and not to mention inherent economic advantage, job creation, skill development, encourage research and development etc.

Big-Bang Deals

$700 million
Deal for M777 howitzers; BAE proposal to make in India

$2 billion
Airbus-Tata combine to manufacture replacement aircraft for Avro transport planes, edge out HAL

$700 million
Kamov to produce 200 light choppers for Indian Army

International Best Practices

Another important aspect is the way in which the MoD engages with the industry – both Indian and foreign. An institutional mechanism is required for ensuring continuous dialogue and finding solutions to the issues that will inevitably emerge when the new 'Make in India' policy framework is put in place along with customised procedures for defence sector.

The 'Make in India' initiative requires a culture of trust between government and industry; an attitudinal change from the existing environment. Institutional mechanism is required to foster a culture of dialogue and consultations in the defence acquisition process itself, as a necessary prerequisite for building enhanced confidence and trust in MoD's procurement systems in the long run. Such system of dialogue and consultations is followed by EU as well as USA wherein all policy drafts pertaining to defence and non-defence acquisitions are published and undergo rounds of discussion between various stakeholders before finalisation. They also publish why certain stakeholder suggestions have not been included and highlight the ones that have been incorporated. Therefore there is a need to adopt international best practices with an open mind to prepare and implement defence acquisition policy documents.

In spite of these shortcomings, there is considerable potential in the government's 'Make in India' initiative. In the long-term, it can lead to creation of military-industrial complex. But several path corrections are required. There has to be a strategy to join the dots of the disjointed initiatives complemented by a cogent strategy for each so that a consistent and convincing picture emerges. It is expected that Manohar Parrikar led MoD will be able to overcome these shortcomings and take this initiative to logical implementation.

RESTRUCTURING DEFENCE EXTERNAL AND INTERNAL

DSA Team

No country that imports 70 per cent of its defence needs like India can be strong. Despite Review Committee in 1995, headed by Dr APJ Abdul Kalam, directing that India must meet 70 per cent of its defence needs by 2014, we did not move an inch forward, as was discovered 19 years later in 2014. The CAG and CGDA audit reports point to extreme corruption in the defence-industrial complex.


National security implies not only safeguarding territorial boundaries but also shaping the environment so that the nation is able to build a cohesive, egalitarian, technologically efficient and progressive society with a good quality of life. In comparison, defence strategy is more focused, concerned with the protection of the state and its citizens from direct and indirect military threats and actions of other states. A National Security Strategy (NSS) should have numerous facets, major ones being: Military Security; Political Security; Economic Security; Health Security; Personal Security; Energy Security; Food Security; Community Security and Environment Security. Defining the NSS involves: Exploration of geostrategic environment through net assessments, bringing out strategic and military balance in comparative terms; outline contours of future threats and challenges emanating from the environmental scan; National Security Perspective and future military strategy; force restructuring imperatives and concepts, threats and capability evaluation, resource allocation and restructuring road map. NSS requires to be followed up by articulation of defence/military strategy in the form of Strategic Defence Review (SDR). We still have not defined an NSS and no comprehensive SDR has been undertaken.

Threats And Challenges

India has land borders totalling 15,072 km some of which pass through very hostile terrain. The coastline is 7,863 km, the EEZ 1.02 million sq km and offshore assets (processing platforms, oil well platforms and seabed pipelines) spread over 17,000 sq km. The neighbourhood is volatile as India faces a nuclear threat, missile threat, cross-border terrorism, demographic assault and illegal immigration and asymmetric and sub-conventional threats including influx of weapons, narcotics and fake currency. Within India, 38 terrorist organisations are banned by the Ministry of Home Affairs. This does not include radical organisations like the Kerala headquartered Popular Front of India (presently dormant) but with links to LeT, Al Qaeda and Maldivian radicals. We have ongoing insurgencies in J&K, Northeast and the Maoist insurgency spanning several states. The volatility and radicalisation of South Asia affects India, with Al Qaeda and ISIS eyeing India. Pakistan's National Security Adviser, Sartaj Aziz openly says "Pakistan should not target those terrorist organisations who are not attacking Pakistan" even as 42 terrorist training camps are running full steam in PoK and Pakistan has given red carpet to Hafiz Saeed to organise terror attacks against India and has released 26/11 mastermind Zakiur Rehman Lakhvi to assist him in this task.

Pakistan is buoyed with the drawdown of Western forces from Afghanistan, having received some US$ 52 billion from the US since 1950 (70 per cent in military hardware), the recent Chinese package of US$ 47 billion mostly for the China-Pakistan Economic Corridor plus 110 *JF-17* fighter jets and six nuclear tipped conventional submarines, continued US support and now Russia leaning to Pakistan, even providing her *Mi-35* attack helicopters. If Pakistan has been trying to bring terrorist organisations in India under a single umbrella, China has commenced a similar exercise. As per recent media reports citing intelligence sources, nine militant groups of northeast India including the NSCN-Khaplang and the ULFA faction led by Paresh Baruah are combining as the United Liberation Front of Western South East Asia under one umbrella with active Chinese intelligence involvement, the meeting having been held in Myanmar in April 2015. Chinese intelligence operatives are active in the Sagaing region and weapons are often shipped to the northeastern groups through the China-Myanmar border. It is clear that the China-Pakistan collusive threat to India spans the entire spectrum of conflict including the conventional, sub-conventional and cyberspace.

If Pakistan has been trying to bring terrorist organisations in India under a single umbrella, China has commenced a similar exercise

Combustible Macrocosm

To compound the above challenges, India has some 4.5 crore unemployed, of which bulk are youth. Industrialisation can create jobs but this would take time and setting up industries requires land. Unfortunately, the Land Acquisition Bill has been caught up in dirty politics, the irony being that it is opposed by the same politicians who acquired land for themselves, family members or through proxies within one km of roads that came up or were proposed over the last decade. Of the 73 million illegal weapons in the world, some 40 million are reportedly circulating in India, the annual turnover of illegal weapons being US$ 4 million. As per the World Drug Report, 11 tonnes of heroin is consumed annually in India. We are likely to become world's most populous country by 2025-30, which will likely increase unemployment unless we get on the path of industrialisation quickly. Management of social change will remain a major challenge and enemy will exploit through radicalisation. Inaction against waiving of Pakistani flags in rallies in J&K and inaction against seditious speeches at such venues will only increase radicalisation.

Virtual terrorism is a reality, as we experienced with the expose of ISIS Twitter handler Mehdi Biswas in Bengaluru. Cyberspace was used for recruitment, planning, coordinating and funding 9/11 attacks as well. Terrorist organisations can 'purchase' such capabilities. Last year, false news of rapes and photos posted on social media of homes attacked and burnt had forced exodus of northeastern youth working in Bengaluru and Delhi. Terrorists can take advantage of social networking sites even through applications like games that are normally developed by third parties and whenever you add an application you are granting it access to your account. As per NIA, IM cadres have been using proxy servers and complex code to chat, setting up email accounts that disappear if they are not accessed in 24 hours, proxy servers to camouflage geographical location, encrypted files and complicated code language; use of US-based Yahoo Inc, Paltalk Inc, Sophidea Inc and Hurricane Electric, plus providers in Nepal, Canada and Ireland; IP address of Nimbuzz chat traced to Pakistan Telecom Company Ltd and others traced to France, Germany, Netherlands, Nepal and India. India should also be prepared for the next level of terrorism, CBRN terrorism through proxy forces. Tokyo subway was subjected to Sarin Gas attack in 1995, US faced Anthrax attacks in 2001-02 and Sarin Gas is presently being used by opposing forces in Syria. A 1.5 kg uranium packet was recovered in Assam by the Army in January 2013 and significantly Chinese strategy of 'unrestricted warfare' includes 'terrorist warfare' and 'bio-chemical warfare'.

Overdependence On Foreign Weapons

No country that imports 70 per cent of its defence needs like India can be strong. Despite Review Committee in 1995, headed by Dr APJ Abdul Kalam, directing that India must meet 70 per cent of its defence needs by 2014, we did not move an inch forward, as was discovered 19 years later in 2014. The CAG and CGDA audit reports point to extreme corruption in the defence-industrial complex. The Ministry of Science and Technology acknowledges that 50 per cent of defence equipment held by our military is 'obsolete'. To cap this, CAG states that balance 30 per cent of defence items produced indigenously are 'substandard'. The irony is that this remains the state despite Joint Secretaries of the MoD on all Boards of the DRDO-DPSUs-OFs. There is plenty of hype about 'Make in India' as far as the defence sector is concerned but the Defence Procurement Procedure (DPP) is hardly conducive. Former Secretary Defence Production, G Mohan Kumar, recently stated that India is 'trying' to simplify procedures, to create a level playing field. But hasn't this game of 'trying to create a level playing field' been played for past few decades by the arms mafia resident in the MoD-DRDO-DPSUs-OFs, which has favoured imports to indigenous developments? To top this all is the bureaucratic red tape, with cases even held up under the previous government yet to be cleared. The 'Make in India, sell anywhere' call by the Prime Minister should be alluring to foreign firms but this is hardly the case in the Defence Sector. Corruption, arms mafia and the system are working full-time to continue with bulk imports of defence equipment.

Strategic Asymmetry

Strategic asymmetry that India faces *vis-à-vis* China and even Pakistan is that while both China and Pakistan are optimising their sub-conventional capabilities proactively, India continues to look inwardly. India continues to be afflicted with voids in strategic intelligence and much more needs to be done towards capacity building in the cyber, space and electromagnetic domains.

Chanakya's prescription of *Yogakshama* (well-being and security) of the people being highest responsibility of the ruler (read elected leader) needs to be tempered with the fact that while nations remain committed to lofty moral principles and humane values, the power of principle can be most effectively pursued when it is complemented by the principle of the relevant power of the times. We need to remember Chanakya's dictum, "Do not be very upright in your dealings for you would see by going to the forest that straight trees are cut down while crooked ones are left standing." At the same time, while addressing the socio-political-economic aspects, we should be treating the public and community as the centre of gravity, while dealing the hard core elements raising arms against the state with a heavy hand. We need continuous surveillance and monitoring, an efficient intelligence system and continuous information operation. We must choke state support to terrorism including states in which so called non-state actors are located, in addition to psychological operations and perception management. At the strategic level, a doctrine is required to attack radicalisation and recruitment despite this being a very tall order.

We need continuous surveillance and monitoring, an efficient intelligence system and continuous information operation

What India Needs

There is urgent need for India to reorganise its higher defence. The country can hardly afford to continue with the MoD sans military expertise and the military kept out of strategic decision-making related to defence of the country. The MoD actually needs to be replaced with a Department of Defence (DoD) headed by the Defence Minister, manned by serving military professionals with civilian cells in Defence (Production) and Defence (Finance). Similarly, the defence-industrial complex (DRDO-DPSUs-OFs) must have military representation (being the users) at the design, planning and decision-making levels. The Chief of Defence Staff with full operational powers needs to be appointed without further delay, to synergise the armed forces, build its capacity as a network centric warfare capable force and usher the much needed Revolution in Military Affairs.

Considering the vast responsibilities of the MHA, India certainly needs a Ministry of Internal Security that focuses entirely on counterterrorism and counter-insurgency and synergises the security sector. There is also urgent need for a Unified Operational Command manned by career specialists for the Maoist insurgency belt. Leaving the issue to be dealt by individual states is a folly when this insurgency spans multiple states and more importantly when the states are the very cause of the insurgency in the first place. Besides how can disparate control of some 135 Central Armed Police Force (CAPF) Battalions optimise this potential especially when the controls are with IPS officers whose forte is law and order, not counter-insurgency? Politics apart, we needed the NATGRID, NCTC and state-level SCTCs a decade back. Ironically, the NATGRID appears delayed and discussion on the NCTC has frozen. As for cyberwarfare, we need high-level public-private partnership monitoring cyberspace like the US Counter Extremist Project (CEP) that augments the US NSA.

Proactive Special Forces

Finally, is the urgent need to establish credible deterrence against proxy wars. Our Special Forces need to be proactively employed at the strategic level on politico-military tasks like gaining strategic intelligence, perception management, building partner capabilities, creating deterrence to state-sponsored terror and shaping the environment in furtherance of own national interests – as is being done by foreign Special Forces – side by side with direct action tasks when required. We need a Special Forces Command under the Prime Minister for strategic employment and a Commando Command for cross-border tactical tasks and within border tasks beyond capabilities of regular infantry.

The challenges of national defence are multiple that are mounting with the passage of each day. The government needs to put the defence of India back on track, on the lines suggested above.

DEFENCE FOR ALL

The positives and advantages of the globalisation of technology are fairly obvious; it is the disadvantages which are becoming increasingly frightening. The lack of technology is literally going to isolate those who can least afford to be alienated by progress. This increases more terrorism acts being committed in those countries as well as increasing poverty and food shortages/medical services availability.

The 'Make in India' idea/concept was introduced in 2006, it was intended to provide an opportunity to Indian industry to undertake research, design and development of high technology complex systems, with government funding up to 80 per cent of the cost of prototype development and assured purchase order for the predefined quantity of the equipment so developed. Defence Procurement Procedure (DPP) was drafted in 1992, comprehensively reviewed in 2002 and revised in 2003, 2005, 2006, 2008, 2011 and 2013. The latest revision is expected to be different – Defence Ministry wants it to be simpler and in tune with 'Make in India'. A role for agents – banned now – and a revision of the blacklisting policy are among the expected changes. If we examine further the DPP is the master manual of capital defence procurements in India. The latest version, the 351-page DPP 2013, categorises defence acquisitions into four sub-categories: 'Buy Indian/Global', meaning outright purchase from Indian/foreign manufacturers; 'Buy and Make' and 'Buy and Make (Indian)', meaning buying from foreign/Indian vendor followed by Transfer of Technology and production in India and 'Make (Indian)', meaning development of the product in India from scratch. DPP 2013 for the first time listed buying from within the country as priority.

Misfits

'Make in India' The Defence Procurement Procedure (DPP) 2013 currently does not fit the 'Make in India' idea. No clause facilitates this in terms that the government has been advocating, even though it does give preference to buying Indian products over global. 'Make' has not helped – the first project under it was awarded only for the development of Battlefield Management System (BMS) for the Army. The new DPP promises to create simple guidelines to ensure 'Make in India' in defence manufacturing.

Middlemen/agents/representatives/consultants are not allowed in the existing DPP. This is slated to change. Defence Minister Manohar Parrikar has articulated a place for 'representatives' in defence procurement and a legal framework for this is likely.

Initiative

The call given by Prime Minister Narendra Modi to 'Come, Make in India' and the subsequent 'Make in India' *blitzkrieg* by the governmental agencies have raised new questions about defence production without addressing the old ones. We are now in 2015 so what has actually been achieved since 2006 as India continues importing more military /defence equipment from the USA/UK/Israel? These countries continue their imperial escapades with the illegal wars in the Middle East which also increases the risks for further terrorism in India by Islamic groups who already disagree with some of the new Indian Government policies! India cannot/should not be increasing the military /defence procurements from these Western countries as India should 'MAKE ITS OWN INDIA'. There are many countries in the West that have the latest technology/defence equipment and who are NOT involved in any war conflicts.

The question now being asked is: how does the current 'Make in India' initiative fit with the make procedure?

While 'Make in India' is apparently all about inviting the foreign companies to use India's soil for manufacturing defence equipment, the make procedure is designed to promote the Indian industry to take the lead in the matter of defence procurement and production.

The information put out on the 'Make in India' website mostly pre-dates the PM's call and fails to address this question.

There is no doubt that both foreign companies and Indian industry will have to play a role in India's quest to become a manufacturing hub. We at ***DSA/***WHS Group are certainly in favour of them and fully support them. The defence public sector in India, the ordnance factories and the Defence Research and Development Organisation cannot be written off as the MoD's non-performing assets. It would be naive to argue – as some people do – that their role needs to be drastically curtailed to give the private sector an opportunity to speed up indigenisation.

Clarity

Clearly, what is needed is a policy that brings clarity regarding the role each of these players is expected to take in strengthening the defence manufacturing sector in India and how these roles will be synergised. It should also address the question of transfer of technology, co-production and co-development.

Such a policy will work only if it is backed by a procedural framework. The Defence Procurement Procedure (DPP) 2013 will need to be re-conceptualised to bring it in sync with the new policy.

In particular, the make procedure will need to be reoriented to accommodate the spirit of 'Make in India'.

A foreign company wanting to enter the Indian defence production sector must know how to go about it; Defence Procurement Procedure (DPP) 2013 does not answer this question. The fact is that with its 142nd ranking in the global index of ease of doing business India cannot expect to attract foreign companies or even fire up Indian industry, which has its own list of woes relating to taxation, deemed export status for the defence industry, industrial licensing and the like.

All these issues need to be addressed. Disjointed measures, such as raising the FDI limit to 49 per cent, have very limited impact when taken in isolation.

Lastly, greater professionalism/anti-corruption modules activation is required in handling several activities such as formulation of the qualitative requirements (specifications) which have derailed several procurement programmes in the past. This entails difficult structural reforms.

The MoD could signal its intention of bringing about a change by setting up a forum where the representatives of the industry – both Indian and foreign – could regularly meet Ministry officials for discussions. We at the WHS Group of Companies are certain that pragmatic and implementable solutions will arise only from such interactions.

The positives and advantages of the globalisation of technology are fairly obvious; it is the disadvantages which are becoming increasingly frightening. The lack of technology is literally going to isolate those who can least afford to be alienated by progress. This increases more terrorism acts being committed in those countries as well as increasing poverty and food shortages/medical services availability. In India we also say *Vasudhaiva Kutumbakam* – the entire world is one family and respect for all religions. We should promote 'Make in India' and Defence for all as it certainly galvanises more peaceful life.

The new policy should address the question of transfer of technology, co-production and co-development

In regards to new technology that is now becoming more affordable to the masses and to/for the terrorists drones are making a full transition from military devices to instruments used in everyday life. Unmanned aerial vehicles, which have been known mainly as a weapon of war, are expected to play increasingly key roles in business and civic affairs, from delivering packages to inspecting roads and bridges to taking photos.

China has already started making /exporting high-tech equipment that is being sold/given licenses for good quality product controls in the USA/Europe.

Jo S Birring

The writer is the Chairman and Group President of The World Homeland Security (WHS) Group of Companies that focuses on World Intelligence Meta Tactics, Anti-terrorism training modules, software solutions and corporate asset risk investigations. He is ***DSA*** representative for Europe and the Americas.

Nanotechnology

Nanotechnology involves development of materials (and even complete systems) at the atomic, molecular or macromolecular levels in the dimension range of approximately 1-500 nanometres. Current research looks to provide detailed understanding of unique properties that materials exhibit at the Nanoscale. Current focus of the research is positioned to create and use structures, devices and systems that have unique and often contradictory properties as well as enhanced functions because of their small and/or intermediate size. Nanotechnology research and development includes control at the Nanoscale and integration of Nanoscale structures into larger material components, systems and architectures as well as automated systems for the production of Nanomaterials and the automatic assembly of structures and systems.

Homeland Security Applications

With the broad reach Nanotechnology has in terms of capabilities, the direct applications for Defence and Homeland Security are only limited by our imagination and how rapidly the technology advances. From shape-shifting armour to fabric that can turn away microbes as well as bullets to new power sources, the defence industries are launching major initiatives and planning for Nanotechnology. While there are efforts for new and improved weapons based on Nanotechnology, the vast majority of the Nanotechnology research and applied research fall into the support category.

Imagine using NanoMEMS to construct a steam powered electrical generator systems for satellites. Steam is currently used in conventional and nuclear power plants to turn turbines that generate electricity. When used on-board a satellite, as the satellite spins and out of direct sunlight, the steam condenses to liquid and when it rotates back in the sunlight, the liquid turns to steam again.

Only the latest Defence and Security technology, training software modules and educational products will decrease the global threat to peace. DSA

ABSENCE OF ENGINES OF GROWTH

Cecil Victor

The writer has covered all wars with Pakistan as War Correspondent and reported from the conflict zones in Vietnam, Laos and Cambodia in South East Asia as well as from Afghanistan. He is the author of "India: The Security Dilemma".

The need to retain a credible defence became more urgent after the Soviet troops entered Afghanistan and Pakistan, once again, lent itself as 'frontline state' to the Western nations and Arabs opposing the Soviet invasion of Afghanistan. Billions of dollars of weaponry was pumped into the region through the Pakistan Army Inter-Services Intelligence which squirrelled away the best like the shoulder-fired *Stinger* missiles for use against India at a later date. The *Stinger* missile was used to shoot down one aircraft and one helicopter of the Indian Air Force during the two-month long Kargil War that erupted in 1999.

Two factors – the manipulation of the security environment around India and the inability to produce engines for its flagship national projects, the tank and the light combat aircraft – have brought India to its current state of overdependence on foreign sources for its military wherewithal.

The manipulation of the security environment was the product of the Cold War between the Western capitalist states led by the US and the Communist States led by the former Soviet Union. They carved out their separate but contiguous spheres of influence and consolidated them within military alliances like the US-led North Atlantic Treaty Organisation (NATO), the Central Treaty Organisation (CENTO) and the South-East Asia Treaty Organisation (SEATO) and the Soviet-led Warsaw Pact.

The Suez Crisis

The Baghdad Pact (predecessor to CENTO) comprising Turkey, Iraq, Iran, Pakistan was anchored by the UK which, having lost the 'jewel in the crown' was keen to strengthen its hold on the oil-rich Middle East and West Asia by its 'East of Suez' policy. But the attack on the Suez Canal by Israel, Britain and France in 1956 and the military revolt in Iraq in 1958 put paid to British ambitions and forced the Americans to begin filling the emerging geopolitical vacuum under the leadership of US Secretary of State John Foster Dulles with anti-Communist military organisations. Hence CENTO with Iran led by the Shah Reza Pahlavi and Turkey and Pakistan. The US was the anchor. Between them CENTO and SEATO bracketed India within constrictive and hostile neighbours supplied with the latest weaponry like the *Patton* tank, the *Sabrejet* and the *Starfighter*. All this had a ripple effect across the Indian Ocean littoral of which India was the central geographical factor.

All this had a ripple effect across the Indian Ocean littoral

The U-2 Affair

The Americans made full use of Pakistan as a forward echelon of its anti-communist phalanx by flying *U-2* spy planes out of the Peshawar airbase for sorties over the Soviet Union and repaid it with generous doses of military hardware and economic assistance. Peshawar was used for *U-2* flights till the Soviets shot down one aircraft piloted by Francis Gary Powers and took him captive.

Between 1947 and 1957 Pakistan had in its armoury both the improved *Patton* tanks and the *Sabrejets*. Seeing this build-up and apprehensive of Pakistani intentions in Jammu and Kashmir and along the borders in Punjab, Rajasthan and Gujarat, the Government of India under Jawaharlal Nehru sought what appeared to be the best bet in the face of arms embargoes imposed by supplier nations to ensure that foreign policy is conducted as per NATO, CENTO and SEATO mandates. India chose the production-under-license route to acquire weapons for its armed forces. Among the first of these was the Folland *Gnat* from Britain under a contract signed in 1957 followed by the *Vickers* tank (renamed *Vijayanta*) which was inducted into the Indian Army in 1965. These were followed by helicopters from France (the famous *Allouette IIIs* renamed *Cheetah* and *Chetak*). All these and more were produced under license in the hope that they will help beat the embargoes frequently imposed by arms producing nations during belligerency on the subcontinent to arms-twist.

The MiG Acquisition

In 1961 after failing to acquire license to produce Western fighter aircraft, India turned to the Soviet Union and acquired the license to produce the *MiG-21* series of fighters under a rupee payment agreement that included barter of commodities the Soviet Union was in need of like shoe uppers, tea and tobacco. In the three decades that the Soviet Union survived thereafter, India received the best in the Soviet arsenal including the hypersonic *MiG-25 Foxbat* that could take aerial photographs while travelling three times the speed of sound. Not all were license produced but because of commonality of spare parts could be used for specific combat roles. At one point the Indian Air Force had nine different kinds of foreign (Soviet and Western) aircraft in its fleet. The *Gnats* and *MiGs* gave a good account of themselves during the Indo-Pak War of 1971.

First Nuclear Test

In 1974, Prime Minister Indira Gandhi decided to send a stern message to the Western world that was trying to force India to sign the discriminatory Nuclear Non-Proliferation Treaty. A 'peaceful nuclear device' was exploded in the Rajasthan desert at Pokhran. Immediately

the West responded with its traditional embargo and cut-off all military and civil-nuclear cooperation with India. But India retained its nuclear option and used it to force the Pakistan-China clandestine nuclear nexus out of the 'basement' and into the open by going overtly nuclear in 1998. The very fact that Pakistan followed suit so swiftly in May that year showed that the American expert who predicted that "Pakistan was just two screwdriver turns away" from acquiring a nuclear bomb was bang on target. All this was happening under Chinese tutelage because it wanted to fence India into a Pakistan-centric defence posture and allow Beijing a freehand in the regional milieu.

Hard Lesson Unlearnt

In 1978 India acquired the Anglo-French SEPECAT *Jaguar* 'deep penetration strike aircraft' to neutralise the Pakistani tactic of deep-basing their fighter aircraft to avoid an Indian attack and, unstatedly, bring some of Chinese military infrastructure in Ladakh and Arunachal Pradesh within Indian reach. It was the first Western aircraft to be acquired in several decades. Having become confident that it had acquired enough competence through licensed production of foreign aircraft, India launched a project to create an Indian fighter in collaboration with the other co-founder of the Non-Aligned Movement Egypt. India was to make the airframe and Egypt the engine. The German expert Dr Kurt Tank was asked to design the airframe. However, Egypt failed to produce the engine and so India had to buy a British engine to fit the Indian airframe. It turned out that the engine was not powerful enough to allow the *HF-24 (Marut)* to perform all the manoeuvres required by the Indian Air Force. Soon the *Marut* died a premature death thanks to those who did not bother to find a suitable engine for an acknowledgely admirable airframe. This was India's first hard lesson in aeronautics – it is the engine that makes a nation self-reliant in any kind of flying platform.

These events and situations have resulted in continued dependence on foreign sources for weapons

Cataclysmic Changes in Asia

During a period of US-Soviet *détente*, West Asia saw nerve-wracking political twists and turns: President Anwar Sadat of Egypt made peace with Israel; threw Soviet military advisers out of his country and was assassinated by a disenchanted group within the army. His repudiation of Soviet friendship had a resonance in India and whispers were adrift of a need for diversifying India's sources of weapons supplies from the Soviet Union to the Western arms producers *a la* Egypt. One result of this pressure was the acquisition from France of the *Mirage-2000-H* which at that time was still in the testing stage. It was intended to complement the *Jaguars* with a nuclear missile carrying capacity as well.

Political developments that impinged on India's security and territorial integrity included the burgeoning of the Sikh Khalistan movement for a nation separate from India. This had the support of Pakistan who presented itself as a 'frontline state' and logistics support base for the Khalistanis led by Jagjit Singh Chauhan. He was given travel documents by Britain and the US to drum up support from the Sikh diaspora. It led to Operation Bluestar and the attack on the Golden Temple where Sant Jarnail Singh Bhindranwale and many of his associates were killed. The final *coup de grace* was delivered by police operations by Julio Ribeiro and KPS Gill. Khalistani adherents assassinated Prime Minister Indira Gandhi in 1984.

Afghanistan

The need to retain a credible defence became more urgent after the Soviet troops entered Afghanistan and Pakistan, once again, lent itself as 'frontline state' to the Western nations and Arabs opposing the Soviet invasion of Afghanistan. Billions of dollars of weaponry was pumped into the region through the Pakistan Army Inter-Services Intelligence which squirrelled away the best like the shoulder-fired *Stinger* missiles for use against India at a later date. The *Stinger* missile was used to shoot down one aircraft and one helicopter of the Indian Air Force during the two-month long Kargil War that erupted in 1999.

Soviet withdrawal from Afghanistan in 1988-89 and the introduction of *perestroika* and *glasnost* by President Gorbachev led to the dissolution of the Soviet Union and the dispersal of its military-industrial complex among the members of the newly independent satellite states. India suffered from the instability in supply of spare parts for a military Leviathan that was nearly 80 per cent of ex-Soviet origin.

In an attempt at eventual self-sufficiency in weapons India had launched flagship projects in the design and development of a main battle tank, a light combat aircraft and a family of missiles under the Integrated Guided Missile Development Programme. While the missile programme achieved spectacular success, the tank and light combat aircraft projects faltered for several reasons one of which was that engines for both projects failed to produce the required thrust-to-weight ratio. A contributing factor to the delay in the LCA project was the withholding by the US of a crucial gadget indigenously developed by India that had been sent to it for authentication and calibration. This was part of the embargo on Indian entities and personalities that was imposed by the Nuclear Suppliers Group.

The consequence of these events and situations have resulted in continued dependence on foreign sources for weapons and India has the unenviable distinction of being the foremost weapons importer. It is said that the percentage of dependence has reduced from 70 per cent to 60 per cent. But we appear to be shifting from one dependency on the Russian Federation to another dependence on the Americans through the government-to-government route. DSA

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