

Military Technology, Governance and Self-Reliance in Weapons Acquisition: Imperatives of National Security

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Introduction

If the most outstanding success of our policy-making post- Independence was in prioritising the build-up of our industrial base through the promotion of scientific education and research, a success which owes its origin largely to Prime Minister Nehru's breath-taking vision, the most debilitating feature of that policy-making was our failure to accord due recognition to the need for enhancing our national security infrastructure. That was, probably, the most unfortunate failure, especially for Nehru, the leader of a non-aligned Nation which needed a strong and self-reliant military, from the very beginning, in view of the unrelenting threat to our security and sovereignty by hostile elements in our immediate neighbourhood. And it had manifested itself, soon after Independence, in his inability to replace the colonial higher defence management structure with one that befits a sovereign Nation. The result: Both our military's war-fighting capability and the build-up of self-reliance in weapons and equipment that buttresses war-fighting had been adversely affected.¹

While much has justifiably since then been said about one aspect of that failure, namely the one that concerns the military's war-fighting capability, e.g. the exclusion, until recently, of the Services Headquarters from our Ministry of Defence (MOD), non-integration of our command structure for conventional war-fighting and related issues of higher defence management, no attention has ever been paid by us, through the years, to our government's continuing failure to achieve, even, a semblance of self-reliance in conventional weapons and equipment, a failure which ought to have caused great concern - and, therefore, called for an overhaul of the management system for our Defence Technology and Industrial Base (DTIB) as a whole - but has, curiously, not. Our DTIB, as known, consists of two components, namely (a) our defence production units, comprising our ordnance factories and defence public sector units and (b) our laboratories and establishments for development of military technology. The occurrence of the failure to recognise the dire need for making our DTIB, as a whole, productive and in achieving, through that process, a reasonable degree of self-reliance in weapons was so unlike what each one of the developed countries of the World, as well as the former Soviet Union (FSU), had experienced in their early years and so unlike, even, what had happened in a newly 'liberated' communist country in our neighbourhood, namely new China, that one cannot but conclude that the founding fathers of our Republic had, for their own reasons, rejected conventional wisdom as regards maintaining a balance between the compulsions of economic Development and of national defence.²

They had, consequently, opted for giving a higher priority to the agenda for our socio-economic development and neglected the need for developing military technology by building an appropriately managed and funded DTIB on a high priority and, through it, establishing a self-reliant Indian military.³ The purpose of this article is four-fold, i.e. (a) to briefly outline the kind of higher defence management structure which we had inherited from the British rulers and the implications of the changes that our Government had brought about on assuming power, (b) to discuss some of the issues concerning the role of governance in the attainment of self-reliance in weapons and equipment, (c) to attempt an analysis of the reasons why we have spectacularly failed to achieve self-reliance in conventional, high-technology weapons, while scoring a note-worthy success in strategic weapons, and (d) to suggest the kind of restructuring of our DTIB management that our Government ought to undertake, without further loss of time, to enable us to successfully 'make' our own high-technology, conventional weapon systems for meeting most of our military's requirements. As an aside, however, one cannot but mention in this connection that the sharp contrast which is now amply evident between our failure to 'make' conventional, high-technology weapons and our moderate success in 'making' strategic weapons has, fortunately for our country, yielded one exceptional benefit: Although we have failed to yet make a dent on making conventional high-technology weapons of our own, our moderate success in developing and producing strategic weapons has ensured that we now possess, at least, the minimum required level of deterrent weapons to ensure our security, weapons which, as known, we could not have 'imported' for love or money.

Post-Colonial Higher Defence Management

Pre-Independence there was no department (or ministry) in the administration of the Viceroy of India, which had been empowered by the British Government in Whitehall in London to function as the colony's Ministry of Defence. That responsibility was given to the Commander-in-Chief (C-in-C), India, i.e. the (British) Chief of the British Indian Army who had his Headquarters in Delhi, in the form of the (British Indian) Army Headquarters. The C-in-C India, a four-star British Army General, was, thus, made responsible for both (a) managing the (British) Indian Armed Forces including their deployment in war-fighting in colonial India's borders and coastlines and (b) overseeing the administration of the British-built, if nominally-present, infrastructure for ordnance production. And, because he reported directly - for all matters pertaining to the British Indian Military and its war-fighting as well as the Indian ordnance factories - to the Chief of Imperial General Staff (CIGS), in London, whose Headquarters had, from its inception, been an integral part of the British Ministry of Defence (MOD), his headquarters, i.e. the British Indian Army's Headquarters in Delhi, had been an integral part of the British MOD. However, when overnight, on 15 Aug 1947, this British Indian Army had become new India's own National Army (and the colonial Royal Indian Air Force, the Royal Indian Navy and the colonial Indian Ordnance Factories

organisation had become our own national entities), our Government had, somewhat surprisingly, failed to comprehend the significance of that change. It had, therefore, failed to put in place an appropriate higher defence management structure for our newly independent Country and, consequently, had failed to integrate our Army, Naval and Air Headquarters and the headquarters of our Ordnance Factories organisation into our newly-formed Ministry of Defence. It had, in fact, gone further and – somewhat inexplicably but with deliberation - made those headquarters to function as subordinate offices of the Indian MOD, while simultaneously appointing a British General as the first Commander-in-Chief (C-in-C) of the newly designated Indian Army - and a British Admiral and a British Air Marshal as C-in-Cs of the newly designated Indian Navy and Indian Air Force, respectively.⁴

Although, in due course, the (British) C-in-C, Indian Army, was replaced by the senior-most Indian Army officer, then a Major General who got promoted to the next higher rank, and, soon thereafter, his post, namely the C-in-C Indian Army, got re-designated as the Chief of Army Staff (COAS), as did, later, the posts of the Chiefs of our other two Services. The position as regards the three Services Headquarters vis-à-vis our MOD had remained unchanged right up to 2005: The Army Headquarters – as well as the Air Headquarters and the Naval Headquarters, as, indeed, the Headquarters of our Ordnance Factories organisation – continued to function as subordinate offices of our Ministry of Defence. In short, a succession of the Chiefs of Staff of our three Services had discharged their duties in a situation where the Department of Defence of our MOD, headed by a Secretary to the Government, called the Secretary (Defence), had, in effect, ‘supervised’ the functioning of our Army, Navy and Air Headquarters. Similarly, the Department of Defence Production, headed by the Secretary (Defence Production & Supply), again an officer of the administrative cadre, continued to oversee the functioning of the Directorate General Ordnance Factories (DGOF).

As known, until recently (i.e. till 2006-2007, when the Army, Naval and Air Headquarters were integrated into our MOD) the Department of Defence routinely received all cases, put up by our military, which had financial and/or administrative import, and routinely exercised its prerogative of accepting/rejecting/recommending each one of those proposals, albeit, in compliance with procedures approved by our Government. And, that norm, practised by the Department of Defence, had set the tone of independent India’s higher defence management system, signalling that the non-military, defence organisations, too, e.g. the ordnance factories organisation and the defence science organisation, ought to follow suit. Thus it is that the Headquarters of the Director General Ordnance Factories (DGOF), now renamed Ordnance Factories Board (OFB), and – till 1971 - the Headquarters of the newly-formed Defence Science Organisation, later renamed the DRDO, functioned as the subordinate offices of the Department of Defence Production & Supply, headed by a Secretary (Defence Production & Supply). In short, as in the case of the Indian military’s three Headquarters, the twin Headquarters of our DTIB had, also, been made to function as subordinate offices of our MOD, i.e. of our MOD’s department of Defence Production. (The situation in respect of the DRDO, however, had changed in 1971, when the DG DRDO had been empowered to function as a Secretary to the Government, making it redundant for the Department of Defence Production to have to ‘oversee’ the functioning of the DRDO and to accord sanctions for expenditure of funds etc.⁵ However, that was only one aspect of our higher defence management which severely affected the functioning of independent India’s DTIB. There was/is, yet, another aspect of governance which needs to be addressed, since it has proved to have been, probably, the most damaging, over the years, and imperilled the functioning of our DTIB.

Non-Integrated Management: The Unique Feature of India’s DTIB

The British in India had established a miniature version of defence production organisation by setting up a handful of ordnance factories and had equipped those for the production of only a few varieties of British-developed, comparatively low-technology, guns and ammunition. Each of those ordnance factories (or a group of factories, in some cases) had, also, had attached to it an independently managed, development-cum-inspection unit, with its own chemical/explosives/metallurgical laboratory in some cases, which undertook, as its major task, the inspection of the products of that ordnance factory (or that group of factories) but, also, at times, carried out minor investigation of defects and/or minor ‘development’ tasks.⁶ As mentioned earlier, the management of this defence production set-up of colonial India, consisting of the Ordnance Factories and the development-cum-inspection units, had been entrusted to the British Indian Army’s C-in-C, i.e. to the (British) Indian Army Headquarters. Back ‘home’, however, the British, with their self-reliant Army, Navy and Air Force, equipped with state-of-the-art, British-made, weapon systems, had a well-developed and, consequently, a very large, but integrated, development and production set-up, which developed and manufactured British-designed weapons and equipment. Further, that organisation was managed, in an integrated manner, by either their Ministry of Defence and/or their Ministry of Aviation and/or their Ministry of Technology etc.⁷

In colonial India, however, no attempt had ever been made by the British rulers, for understandable reason, to develop military technology (i.e. to develop and produce ‘indigenous’ weapons). Therefore, colonial India’s ordnance factories had only been engaged in the production of British-developed guns and ammunition, under conditions similar to today’s licensed manufacture, and the concept of an integrated management system had never, even, been mentioned in colonial India. In other words, the question of putting in place a system which was well established in the UK - for developing and manufacturing British-designed weapons - had never arisen in British India.⁸ Therefore, during the transfer of power in 1947 our Government had not inherited, from the British rulers, any such integrated organisation for development and manufacture of indigenous weapons (or, even, thought of it, in all probability). The net result was that new India’s political masters had not been confronted, in 1947, with the necessity for decision-making in this area of higher defence management, too. And, it had ended up, once again, by opting for what it had envisaged as the ‘status quo’ of the colonial era, i.e. by retaining the same type of management system, for the inherited defence production organisation, as the British rulers had designed for colonial India, i.e. a type of management system which is suitable for ordnance factories geared to undertake ‘licensed production’ only, and, consequently, by opting, a little later, for setting up our Defence Science Organisation, as an independent entity.⁹ That, in short, is the genesis of the formation of

independent India's Defence Production Organisation and Defence 'Development' Organisation as two separate entities, under separate management systems, and was the reason why our DTIB has remained a divided house. In short, the separate existence of a Department of Defence Production & Supply, headed by an administrator, designated as Secretary (Defence Production & Supply), and of a Department of the Defence R & D, headed by our Scientific Adviser, i.e. the DG DRDO-cum-Secretary (Defence R & D) had completely destroyed any scope for putting in place an integrated management system for the development-cum-manufacture of indigenous weapons. Further, as in the case of our military, no serious thinking was thereafter given to improve matters in the case of our DTIB, too. However, whereas, recently (in 2005), some efforts were initiated by our Government of the day to integrate the Service Headquarters into the Department of Defence of our MOD and, also, to bring about a nominal integration of our command structure for war-fighting, the overhauling of our DTIB management structure on the required lines has not yet been thought of.¹⁰

Need for Integration of our DTIB and its Management

Establishing a reasonable degree of self-reliance in weapons and equipment is, admittedly, as important a factor in strengthening national security of a non-aligned nation as the maintenance of an efficient military. However, as mentioned, unlike the governments of both industrially developed countries and communist China and the Former Soviet Union (FSU), successive governments of our country and, even, our military at the highest level of its leadership – or, at least, most of it – had, till very recently, found nothing amiss in the position that each one of our major weapon systems for conventional war-fighting continued to be imported, i.e. outright purchased or both purchased and made under licences, obtained from foreign manufacturers. There were a few other reasons for this unusual occurrence, too. But, strangely enough and almost unbelievably, one reason for this had been that our decision-makers at the highest level had felt – especially, during the first three decades of our Independence – that our scientists and technologists were not capable of developing military technology and state-of-the-art weapon systems.¹¹ Therefore, there had been no efforts made by successive governments to invest in and overhaul our self-reliant weapons making enterprise, i.e. to develop military technology in the real sense. It was, therefore, only in 1971 that the then Prime Minister, Indira Gandhi, had taken matters into her own hands and had set the ball rolling for the making of moderate investments in the build-up of our DRDO and for empowering our Scientific Adviser/DG DRDO to overhaul our military technology development base.¹² The result had been a mixed fare, however: whereas we have made a remarkable success of getting adequate returns on our investments in the 'making' of strategic weapons, namely those weapons of deterrence which cannot be purchased by a non-aligned country from any source, our record in making conventional but high-technology weapon systems remains patchy, and self-reliance remains an unachieved goal. As known, we continue to drain our resources for acquiring from developed countries each one of the required items such as main battle tank, a state-of-the-art combat aircraft and sophisticated naval craft. The fact that we have scored a success in making strategic weapons, e.g. ballistic missiles and nuclear warheads, but yet fail in conventional weapon-making ought to be noted and make us inquire into its reasons. However, the reason is, probably, not far to seek. Whereas we had taken enough care to ensure that both the functions involved in the 'making' of our strategic weapons are undertaken under one roof, i.e. under an integrated management structure for both development and bulk production, we continue to live in a divided house where the 'making' of conventional weapons is concerned.¹³ As known, in every industry in the world, be it the civil-use aerospace industry or a defence industry in a developed country, the development of any kind of equipment (or a special material or a chemical or a metal/alloy) and its eventual bulk production constitute one integral function which can only be discharged by one, unified management. In our case, in so far as indigenously developed conventional weapons are concerned, there are two organisations with the equivalents of two CEOs/Boards of Directors. Whereas the DG DRDO, who has full control over his establishments (but only limited access, through 'co-operation' window, to the defence production organisation), bears primary or total responsibility for 'developing' a weapon system, the responsibility for establishing the 'manufacture' of the developed equipment and for undertaking its bulk production lies, at the final count, with the chief of our defence production organisation, namely the Secretary (Defence Production & Supply). This separateness of management of Development and Manufacture functions is a unique feature which only exists in our country. That system has, however, failed, as known, despite our Government making moves from time to time, to 'superficially' change the system. And that failure occurs, primarily, because, as in the case of makers of ordinary equipment, the development-cum-manufacture of a weapon system, too, needs an efficient, single-point control of what amounts to a constant interflow of expertise, i.e. men and machinery, which are primarily dedicated to either 'development' or 'manufacture' activities but are capable of being utilised and have to be utilised, with total ease, in solving a host of inter-related, development and/or manufacturing problems. It is this feature of an integrated management system of an original equipment manufacturer (OEM) which makes it possible to solve a plethora of interface problems, inherent in developing any sophisticated (or, even, simple-design) prototypes and components, within a reasonable time-frame and in conformity with budgeted costs and, later, in making the transfer of technology by the 'developer' to the 'manufacturer' a success.

Other Issues Concerning DTIB Reform

Before we proceed to examine, albeit in broad outlines, the basics of how such an integration of our DTIB management could be brought about, we must hasten to add that there are other issues, too, which need to be addressed in connection with any discussion on military technology and development of indigenous weapon systems by our country. Some of those issues concern the interface between the DRDO and the Services, e.g. the need for ensuring the reasonableness of Qualitative or Staff requirements (i.e. QR or ASR or NSQR), the need for consultation between the development agency (or the prime contractor) and the Services at all stages, the scope for making changes in the qualitative requirements mid-stream etc.¹⁴

Possible Method of Integration of DTIB Management: Near- Term Solution

Every country in the World, which successfully makes weapon systems, has done so by setting up companies or

corporations or associations which allow them to both develop and manufacture weapons under an integrated management. And, there are both private and publicly owned companies which make weapon systems, and most of those companies are large institutions which, nevertheless, collaborate with other companies, if required, to develop a weapon system and largely outsource both development and manufacture of components and sub-systems. However, they assume full responsibility, as a prime contractor, for the integration of the weapon systems and for the performance of their products. In other words, those companies, singly or as joint ventures, remain accountable, as the prime contractor, to their customers, i.e. the governments or the military who acquire their products, at all time. Since we have no such armaments manufacturing company or companies yet in our private sector which have the required expertise and infrastructure, including personnel and facilities, to immediately undertake development and manufacture of sophisticated weapon systems and since our Government has invested heavily into the build-up of such infrastructure within our Government owned institutions, i.e. the DRDO laboratories and establishments and the ordnance factories (or, in the case of 'non-armament' systems such as electronics and aerospace products, a few defence public sector units, e.g. the Hindustan Aircraft Ltd, the Bharat Electronics Ltd, the Bharat Dynamics Ltd etc), in near term we need to make full use of those institutions while setting up corporations with integrated management for development and manufacture. In short, a few publicly owned corporations ought to be formed by combining one or more DRDO establishments, dealing with technologies of the same class, with the corresponding ordnance factories and/or defence public sector units. One good example, for us, is France where, in the past, a number of such government owned corporations successfully developed and manufactured explosives, armaments, missiles and aerospace systems (e.g. SNPE, SEP, Euromissile).¹⁵

One or two examples will illustrate our point. (a) We could constitute one public sector corporation for 'making' (i.e. developing and producing) combat vehicles by combining our Combat Vehicle R & D Establishment (CVRDE), a DRDO laboratory, with our Heavy Vehicle Factory (HVF), an Ordnance Factory, and (b) We could constitute another company for the development and manufacture of artillery, small arms, ammunition (and other explosive devices) by combining a cluster of our armament R & D laboratories, i.e. the Armament R & D establishment (ARDE), the Terminal Ballistics Research Laboratory (TBRL) and the erstwhile Explosives R & D Laboratory (now renamed) with such ordnance factories as the Gun & Shell Factory at Cossipore, the Rifle Factory at Ishapore and the ordnance factories at Kirkee, Bhandara etc which manufacture explosives and explosive devices). Further, each of these newly constituted PSUs ought to examine the possibility of forming joint ventures with reputed Indian private sector companies, e.g. Larsen & Toubro, Mahindra & Mahindra and the like, with a view to developing and manufacturing weapon systems in a more efficient manner and, also, explore the possibility of accessing new technologies through collaboration with foreign companies. Finally, once we accept, in principle, the necessity for integrating the management of the so-called 'development only' institutions with that of the 'manufacturing units' and merge selected DRDO laboratories with the appropriate ordnance factories (or defence public sector units) to constitute a few public sector companies, each dedicated to 'make' weapon systems of one class under an integrated management, we will have to do away with the department of defence production and supply, headed by a generalist administrator. In short, that department/organisation needs to be abolished, and, as in France (and the USA etc), an integrated department, headed by a trained and experienced 'technocrat', constituted.

That department would then be required to co-ordinate, at the policy level, the development-cum-production activities of the (newly constituted) weapons manufacturing companies and, also, assist those companies, if and when required, in their commercial operations, e.g. in promoting sales to other countries. In other words, the task of such a newly constituted department would be to provide assistance to the CEOs (and the Boards of Directors) of the weapon 'making' companies, wherever possible, in achieving their targets (and not to impinge on their autonomy).¹⁶ Again, the example of France, which has, in its MOD, a technocrat, called the DGA (Direction General pour le Armement), for doing that job will be of interest to us. Once the contours of the functions of such a department are decided upon, it would be easy to see where some of the other functions, e.g. weapons acquisition for our military, would fit in. Incidentally, the USA where all military weapon systems are developed and manufactured by large, privately owned corporations, e.g. multinational companies, and the Department of Defence has scientists and technocrats to oversee research and development activities, undertaken by both the government owned laboratories and the private sector institutions including universities, have taken a leaf out of France.¹⁷ Finally, in the changed circumstances which have been envisaged in the foregoing paragraphs, our DG DRDO-cum-SA would have the responsibility only for initiating and overseeing the advanced-technology research and development activities for futuristic weapons. Those activities would be funded by our Government and undertaken by both the research laboratories which remain within the DRDO and our universities and other research institutions.¹⁸

Recent Initiatives by our Government

In the final days of the previous (BJP-led coalition) Government, a much-awaited attempt at restructuring our higher defence management had, for the first time, been made, starting with the setting up of the Kargil Inquiry Committee. Although the recommendations of that committee have not been published, the published contents of the main Report, an excellent document, clearly indicate that some of the ills of our higher defence management structure have been addressed by that Committee in their Recommendations. In fact, in all likelihood it is in the pursuance of some of those recommendations that both the previous Government and the present (Congress-led) coalition government had, during 2006 and 2007, instituted two more studies, one by the Kelkar Committee and another, in 2007, by the Rama Rao Committee, to make recommendations for restructuring with a view to rectifying what they perceived as the shortcomings in the functioning of the DRDO. As known, after receiving the Kelkar Committee's recommendations and, also, the comments of the Standing Committee of the Parliament in 2007, our Government did constitute a few Boards and Committees, some chaired by eminent, independent persons of knowledge and experience, and others, presided over by the SA/DG DRDO, with a view to making our DRDO and its establishments more productive and more accountable. But, it seems that, even, after taking those

initiatives our government is not satisfied and not confident that the performance of the DRDO would improve.

A study of the Kelkar Committee's findings, as reported by our press in 2006, would show that those findings have, also, altogether missed what we perceive as the real cause of the ills of our DTIB. Therefore, the implementation of that Committee's recommendations would, also, according to our logic, amount to undertaking cosmetic changes only and not serve the real purpose. In other words, as long as the present management structure of our DTIB, comprising two, separate organisations, continues and the development of prototypes of subsystems of conventional, high-technology weapons and the integration of the complete weapons are undertaken by the present DRDO laboratories in isolation, i.e. in the absence of an integrated management for development-cum-manufacture, we would fail to deliver goods.¹⁹

The Rama Rao committee's work is reported to have been completed, too, and the recommendations, as reported in the newspapers in April, 2008, call for making five clusters of 'like-minded' (e.g. Electronics, Armament etc) DRDO laboratories, each headed by a Director General, and, presumably, for each such cluster, as a whole, to undertake the development of one class of weapon. The report has, also, mentioned the need for accessing newly developed technologies from developed countries by entering into collaborations, but, apparently, this report, too, does not recommend the integration of DRDO laboratories with OFs or defence PSUs and the 'making' of indigenous weapons under an integrated management.²⁰ If the press report is correct, it would appear that the Rama Rao committee, too, has not acknowledged the need for integrating the managements of the concerned development agency and of the relevant production unit(s).

The New Acquisition Procedure for Weapons and Its Impact on Self-Reliance

Prior to 2006 the Defence R & D Board had handled all cases for weapon acquisition which had been categorised as fit for 'making'. However, post-Kelkar Committee we have a new procedure for procurement, called DPP-2006, which has made distinctions between classes of weapons, based on complexity, security-sensitivity, order of technologies (high/low) etc, and, although high-technology, complex systems would fall under the so-called 'make' category, the new 'make' procedure, while apparently encouraging indigenous development, will tend to make the outcome of the step-by-step examination of feasibility studies etc un-favourable to our DTIB, i.e. a DRDO/Defence Production amalgam, under a non-integrated management.

The intention behind the framing of the new 'make' procedure is beyond reproach. But, it is so elaborate that its implementation will need putting in place a many-faceted organisation which it will not be possible for us to build in a hurry. There will, therefore, be taking of short-cuts in the course of that procedure being followed, and incompetence which, is likely to vitiate the implementation of that procedure.²⁰ However, we need not, for our purpose, endeavour to critique the new acquisition procedure and will not. But, the fact that there is now, on the ground, an acquisition organisation in our department of defence highlights the position that the status quo of the continuing failure of our DRDO, as it is constituted now, to deliver goods and yet exist as an organisation with its large body of scientists and infrastructure may not continue for long. In short, it is envisaged that our competitors, established military industrial corporations of developed countries, in their bid for acquiring billion-dollar worth Indian orders for supply of high-technology, conventional weapon systems, have all of the advantages of an integrated management for development-cum-manufacture of such weapon systems through outsourcing of both development and manufacture of subsystems and components etc etc, and, therefore, will have an unfair advantage, unless we provide our DTIB a level playing field, without loss of time, by integrating the managements of our DRDO and our Defence Production.

Conclusion

As in the case of those who had, in the previous era, believed that the route of acquisition of weapons through import-cum-licensed-manufacture would assist us in developing weapons of our own; there could, now, well be those who would propose that by selecting foreign-made, high-quality conventional weapon systems to meet our present requirements and, simultaneously, making/encouraging those foreign weapon-makers to set up joint ventures with a few reputed Indian engineering hardware (or electronics) manufacturing companies, we will enable our private sector companies (which would enter into agreement with the foreign weapon-makers to form joint venture companies) to assimilate design/development expertise and be empowered to develop our own ability to 'make' (i.e. develop and manufacture) such advanced-technology weapon systems. Unfortunately, however, our private sector companies are not 'equipped' to absorb such weapon related technologies. That expertise including the required infrastructure is available only with the DRDO laboratories and ordnance factories (and, in some cases, defence PSUs). Therefore, our country, having invested heavily in building that expertise and infrastructure in government owned institutions, must ensure that we restructure our DTIB and give it a level playing field to compete with the foreign weapon-makers. After all, the NRI scientists who help foreign weapon-makers to develop high-technology weapons in the developed countries come from the same stock of highly skilled Indian scientists who form the core of experts in our own laboratories and production centres. All that we, primarily, need is that we provide the right kind of work place, i.e. the appropriate, integrated management system, which will enable our scientists and production engineers in our laboratories and production centres to successfully 'make' weapons to equip our military for conventional war-fighting.

. *Based on the text of a talk delivered at the USI on 09th Apr 2008.

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