

The structure of leading defence industrial nations economics essay

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47. World over the defence industries have been on a path of modernisation, transforming themselves based on the principles of modern warfare. These defence industries have established an enormous R&D base and have carved out a niche for themselves in the emerging global defence markets. India due to its over-emphasis on public sector has lagged behind and thus has an under-developed private defence industrial base. 48. An analysis of the broad structure of the leading defence industries of the world, their organisation, their methods of setting up interaction amongst the public and private sector, their policy making and their procurement and development support functions, would greatly help in recommending an optimum structure for the Indian defence industry. 49. The US Defence Industry. The US is the largest exporter of defence equipment and also has the largest defence market in the world. It is home to the five largest globally distinguished defence companies namely Lockheed Martin, Northrop Grumman, Raytheon, Boeing and General Dynamics who have traditionally dominated the world markets in defence equipment[1]. The country has evolved a highly integrated structure for the private defence sector enterprises to interact with the defence establishment as well as policy makers. 50. The Department of Defence (DoD) in the US is entrusted for major policy making decisions as well as is the main customer for the defence industry[2]. The private industry interacts with the DoD through the National Defence Industrial Association which is responsible for providing an interface between government officials, military and industry professionals, and organisations that represent branches of the armed forces and homeland security. The National Defence Industrial Association has various

divisions and working groups which have separate working areas, some of them have been enumerated below[3]:-(a)Government Policy Advisory. It is entrusted with educational awareness and assisting in policy development. (b)Legislative Information Division. The division bridges the gap between the government and the industry officials.(c)Procurement Division. The division is entrusted with monitoring the procurement and acquisition policies and procedures which affect the government and industry relationship. It also provides its member companies with the information on the latest developments related to the acquisition process. 51. The US defence procurement procedure has been streamlined over the years, it employs various agencies and directorates for planning and managing the contracts. The agencies and directorates involved along with their charter of duties are given below:-(a)The DoD is responsible for defining the procedure for domestic procurement with respect to foreign sales, and the policy for procurement is looked after by the directorate of procurement and acquisition.(b)The Defence Contract Management Agency is the organisation entrusted with the responsibility of contract management and it in turn reports to the DoD. The agency also advises the DoD of probable risks, selects the competent companies and also writing of contracts. After the contract is finalised it monitors the performance of the products and timelines for delivery.(c)The US comprehensively employs the cost-plus structure to share the associated risks involved in R&D and also caters for incentives and delay clauses in all their procurement contracts. 52. The US invests heavily in the defence R&D and has the largest budget for the same in the world. It believes in reducing the risks in the infancy of product

development which is lucrative for the private companies and investors, coupled with this is the cost-plus structure of procurement till the risks involved are quantified. In addition, the country supports innovation in the defence and aerospace industry by providing special tax incentives, these tax incentives are in the form of tax credit intended to augment incentives for high-risk defence and aerospace research. 53. UK Defence Industry.[4]In the colonial days the British defence industry was owned and controlled by the government, but now the defence ministry seeks active participation of the private industry for product development and services. Privatisation of the industry has pegged UK as the second largest defence industry, not only is it a domestic supplier but is also the largest global defence exporter only to be overtaken by the US. 54. The defence industry has the ministry of defence as its major client which contracts for defence equipment and services. The ministry keenly promotes the participation of private players in the arena of defence production. Some of the major private companies who are global suppliers of defence equipment are Rolls Royce, VT and QinetiQ, Smiths Group and BAE Systems. The National Defence Industries Council, which is headed by the Secretary of State for defence is the highest level of interaction between the government and the industry. The council is also responsible for formulating the defence industrial policy and the industrial strategy. The council is supported by five sub-groups for deliberating on particular issues concerning policies, these sub-groups are the R&D group, Joint Information Group, Commercial Policy Group, Joint Communications Group and the Skills Group. 55. The ministry of defence recently has developed a wide array of supply models with numerous new contractual

models being developed for significant programs, along with the use of alliances and lead systems integrators. The UK also has historically been the leader in developing innovative acquisition and financing models for defence production. 56. The department of Defence Equipment and Support is responsible for equipping and supporting the armed forces of UK for the present and futuristic endeavours. It is the nodal agency designated for equipment procurement and support services, it manages all the equipment right from its inception stage till its obsolescence, and this is achieved by garnering partnership agreements and private finance initiatives with the industry in accordance with the Defence Industrial Strategy to provide comprehensive solutions for the armed forces. 57. R&D for defence technologies is a high priority task for the Ministry of Defence. The Ministry of Defence discharges the under mentioned functions as regards technology development. (a) Ministry of Defence Technology Strategy. A periodical journal is published by the ministry in which key technologies which would be critical to defence are identified, also the challenges likely to be faced and the effects sought are enumerated. (b) The ministry steadily augments the number of research programs open for competition with the intent of expanding the supplier base. (c) A key arena for research are the Defence Technology Centres which are formed by the ministry. These centres promote alliance with the industry and universities and are jointly funded by the Ministry of Defence and the industry. 58. The South African Defence Industry. [5] The foundation of South African Defence Industry was laid in the early sixties with the formation of the Armaments Board which was responsible for developing the infrastructure required for the defence

industry. The board was also mandated to acquire armaments for the defence forces as also identify the fields for private sector defence production. In the same era ARMSCOR, a defence corporation which was owned by the government was setup to take over all the government controlled munitions factories, certain private sector enterprises as also establish new R&D facilities. 59. The proliferation of the private sector required an agency to coordinate the involvement of the private sector and the industry and thus the Defence Advisory Council came into being in the late seventies. The council is headed by the Minister of Defence and has the President of the Armaments Board and representatives from the major private sector companies, as its members. 60. As a result of the public and private sector coordination, setup in the yester years, the private sector today claims 52 percent of the sales for the local defence industry, with the remaining being taken on by the public sector. The private sector firms which dominate the markets are Grintek, Reutech, Advanced Technologies and Engineering (ATE), African Defence System (ADS). Land Systems OMC and Tellumat, there are a host of other firms which are feeding these larger companies with technology and components. The government owned Denel company dominates defence production in the public sector. 61. ARMSCOR is the organisation which has been officially appointed as the acquisition agency for the South African Defence Forces. The organisation also renders professional advice regarding acquisitions to other Government departments, with the prior consent of the Minister of Defence. It is headed by a chairman who is appointed by the government and he operates in conjunction with the Secretary of Defence and the Chief of South African

Defence Forces. 62. The Australian Defence Industry[6]. The Australian Defence Industry comprises of eight major companies out of which one is state owned and the rest are from the private sector, apart from the large companies there are a host of small and medium enterprises which contribute to the defence production of the country. Australia ranks eighth on the list of global defence equipment importers, thus signifying the inadequacy of the domestic industry to meet its demands. The Australian government lends active support to the domestic defence industry to improve its potential and maximise its output. Some of the flagship programs of the government for the growth of the defence industry are as under:-

(a) The Australian Industry Capability program has been initiated by the government to enhance the participation of the defence industry. Under this program for any tender which is in excess of \$50 million, the contractor has to submit a plan illustrating the means as to how it visualises to maximise the growth for Australian companies.

(b) The Global Supply Chain (GSC) program, intends to support the entry of Australian defence industry into the international delivery chains. The program institutes agreements with multinational firms to facilitate opportunities for the domestic industry to compete in global markets.

(c) The Australian defence companies are aided by the Defence export unit to gain access to global export markets and hence broaden their customer base. This also helps in maintaining certain defence industry capabilities which may be unviable owing to miniscule or irregular demand.

(d) The Australian government annually releases a Public Defence Capability Plan which provides a description of principal equipment proposals that are planned for Government consideration in the near future.

It also gives out the critical areas for development by the local industry. 63. The prime government defence R&D agency is the Defence Science and Technology Organisation, with the primary responsibility of delivering advice and solutions for Defence. The organisation is headed by the Chief Defence Scientist who is appointed by the Ministry of Defence. It focuses on research topics which are exclusively required for the defence forces and has partnership and collaborative programs with the private research organisations and universities. The organisation also keenly transfers technology to the private industry for its commercial use.

Options for Opening the Indian Defence Industry

64. The longstanding and time tested success story of the leading defence industrial nations merits scrutiny to identify tangible recommendations for improvement of our own indigenous defence industrial base. Three models have been illustrated with minor modifications in the present scenario, in the succeeding paragraphs. 65. Option I: Creation of National Defence Manufacturing Commission[7]. The commission should be set up for supporting the domestic defence industry and should be under the Prime Minister's Office. The mandate of the commission should be as under:-(a)The equipment for domestic production should be open to all the manufacturing agencies with strict timelines and targets. The competition for bidding should be on an equal turf.(b)The commission to ensure that the offset clause is invoked only for the largest weapons programs and the offsets be raised to about 75 percent in a phased manner.(c)The commission should endeavour to promote indigenous R&D in critical technologies.(d)It should encourage employment of indigenously developed civilian technologies and materials

for defence applications.(e)It should promote domestic defence companies in constructing export capabilities.(f)The commission should increase the employment projects in the defence manufacturing sector. 66. The National Defence Manufacturing Commission (NDMC) should be headed by a retired senior officer from the armed forces who had been involved in defence procurement. The commission should have two distinct arms namely an advisory wing and an implementation wing each headed by a secretary level government representative functioning under the chairman. 67. The different arms of the Gol, defence forces, industries and experts would be represented in the advisory wing. It would have representatives from various core ministries as key advisors. The wing would also include representatives of the three services and a civilian officer representing the Ministry of Defence. Finally, the advisory wing will have two esteemed and knowledgeable experts in the field of defence policies and defence technology as its members, who would be elected by the members of the advisory wing. 68. The advisory wing would have prime concerns regarding three key result areas which are listed as under:-(a)Manufacturing and procurement policies. The wing would be mandated to make and improve upon the policies governing the defence production and defence procurement for the country. These policies would include the DPrP, DPP, FDI policy and the National Defence Manufacturing Policy. It would endeavour to include the existing policies and reports on procurements and offsets into a single comprehensive policy to simplify the procedures. The wing would be a forum for joint interaction between the industry, the Gol and the armed forces, with the primary aim of promoting home grown technologies.(b)Planned

achievement of indigenous production targets. The wing would publish an annual report forecasting the requirements of the armed forces for the next five years and their subsequent projected tendering dates, this in turn would give a prior notice to the industries of what is likely to be expected of them in the near future. In addition, it would develop a five year plan for the growth of the domestic defence manufacturing sector with aim of achieving 50 percent indigenous production in the first plan and 75 percent in the subsequent ones. It would also prepare an annual report, to be tabled in the parliament, on yearly domestic defence production, while comparing the production with the projected growth it would recommend measures to enhance the same in case of shortfalls.(c)Implementation of the projected growth. The wing would outline an action plan with detailed actions and timelines required to facilitate attainment of the desired objectives. It will also be responsible to peruse the LTIPP and the annual procurement plan and generate assistance on probable areas for domestic contribution. Based on its analysis and interaction with the industry, it will advise the GoI on protracted technological growth plan for the country and highlight areas for joint ventures and collaboration. 69. The implementation wing should be designed as the executive arm of the NDMC which would be responsible for monitoring the implementation of policy decisions in large defence deals. The wing would be directly answerable to the chairman of NDMC and would be fully staffed with members from various government organisations including the armed forces and the CBI. The charter of duties for the wing would include the following:-(a)Audit of large defence deals with specific reference to offset obligation realisation.(b)Audit of technology transfer in

case of foreign vendors.(c)Ensuring that the policies formulated by the NDMC are being followed in letter and spirit. 70. Option II: Comprehensive Procurement and Development Procedure.[8]India today has very complicated procurement and development procedures with numerous categories and clauses making it difficult for the vendor and the user to surpass the bureaucratic hurdles. This option dwells into simplification of these procedures with a view to enhance the domestic defence industrial base. 71. The GoI must implement Make or Buy and Make (Indian) category for all major defence deals and ensure that the main vendor is an Indian company. It is imperative to mandate that major defence programs like the force restructuring and modernisation be developed under the Make or Buy and Make categories. This resolution would prove critical to endow the Indian vendors with the magnitude and experience that is imperative for the industry to progress forward. The industry today lacks technology development and to overcome technology gaps, joint ventures may be formed with global entities. 72. Presently the multinational companies are not forthcoming as regards defence production, due to the FDI cap which currently is pegged at 26 percent, also the GoI has not spelt out a clear cut policy on FDI in defence R&D. In the absence of a clearly spelt out long term policy on foreign investments the major players as of date detest investing in the Indian markets, which in turn limits the influx of technology. Hence, there is an urgent need to relax the FDI limit for defence production up to 49 percent for generating adequate interest globally in the Indian defence production market, this may be increased subject to the under mentioned clauses:-(a)The international partner should usher in cutting edge

technologies into the the country which as of now India is devoid of.(b)The foreign collaborator should be mandated to establish full fledged R&D facilities in the country and the rights to use the newly developed technologies should be with the Indian partner.(c)With the prior Gol approval the products manufactured by the joint venture should be exported to the global markets.(d)It is imperative that the operational control of the joint venture should rest with the Indian entity. The appointment of foreigners specifically for the project be approved by the Gol, the CEO of the project should always be an Indian national.(e)The work force of the joint venture should mainly comprise only of Indian nationals. In extraordinary situations where in the services of a foreign national are a must for certain specialist tasks the appointment may be made after taking prior permission of the Gol.

73. In order to make the FDI policy in defence manufacturing comprehensive and easily understandable the following need to be implemented:-[9](a)The policy should be unambiguous, simple, clear and concise.(b)All FDI proposals should be dealt by a single agency with a time bound approach.(c)The list of products qualifying for FDI should be promulgated in advance so that the Indian vendors can form suitable joint ventures with foreign companies. 74.

In the present day scenario the DRDO and the DPSUs play a major role in deciding as to what is going to be developed by them and what should be given to the private sector. The monopolistic approach of the DPP provides a significant edge to the public sector where in the private players tend to loose out, hence it is impossible to provide a level playing field for the private sector with the present DPP. The Gol needs to classify all the projects under the ' Make' or ' Buy and Make' category with an open bidding, this

would create a conducive environment for the private sector and reduce the monopoly of the public sector enterprises. 75. Presently the defence manufacturing entities of the public sector employ different procedures for procurement, which in turn breeds inefficiency and fragmentation of the vendor base. Procurement systems for DPSUs and the OFBs must be centralized into a single organization which would administer various aspects for procurement. This would construct a centralized defence vendor base, and would enable the private entities to participate in the production of components and sub assemblies. It would also entail creation of standardised contracts, frameworks and clauses which may be accessed by the contracting entities. This would not only help in reducing the variations in contracts but would also promote a common platform for understanding the requirements across the board. Option III: Building the Private Sector Capabilities. 76. Domestic Champion (RUR) Program.[10]The Vijay Kelkar committee, as part of financial reforms had suggested the concept of Raksha Udyog Ratnas (RUR) or the Domestic Champions. The award of the RUR status would be a giant leap towards promoting indigenous defence manufacturing capabilities. The Ministry of Defence had committed of granting this status to 13 companies which in fact could never materialise. The RUR status would put a private company at par with the DPSUs and thus would get benefits akin to the public sector. The initial statements of the MoD show that the status would mean that a private company would get up to 80 percent financial aid in terms of defence R&D and would be able to import duty free technology. The awarding of the status was entirely merit based and criteria for selection into the select club was based on their

financial standing in the market, managerial and technical capabilities and the amount of FDI in the company. 77. It is imperative that this status be given to private sector enterprises as it would bridge the gap between the public and private sector as far as defence production is concerned. This status can be accredited by constantly updated process which would change once in every two years, considering the performance of the RUR companies. A rolling process which has been advocated would not only keep the RUR firms on their toes to deliver, but would also provide the entrants an equal opportunity to enter the market. 78. Technology access. It has been seen that there has been insignificant transfer of technology in the recent past between the public and the private sector. The GoI has not been able to ensure the sharing of technologies which have been developed by the public sector with the private sector, which in turn entails reinventing of the entire wheel for new product development. The government should provide the private sector with access to essential technologies which have been developed by various research institutes of the GoI. In order to commercialise these technologies a royalty fee may be charged from the private enterprises. 79. Procedural advisory. The GoI should set up a single window advisory cell for defence production related procedures. This would facilitate the entry of new enterprises and would thus ensure that these new entrants do not loose out on the grounds of procedural lapses. 80. Defence production ITIs. In order to improve the skill level of workers in the defence production sector, special defence production ITIs may be formed to enhance the skills to the workers. As of date there is no formalised training for these workers and they heavily rely on on the job training. Subsequently

universities may be set up for higher studies and research in this field, who would offer formalised courses and degrees with regular examinations. These degrees would then be a primary qualification for an individual desirous of a placement in the defence manufacturing sector. 81. Support for Small and Medium Enterprises (SMEs).[11]The GoI needs to look into the needs of the SMEs, since a major component of the defence products come from this sector. Neglecting this sector would entail poor quality with increased costs. The GoI should focus on soft loans for modernisation and improved quality control for these enterprises. The soft loans may be provided once an enterprise has earned its ISO certification which would automatically improve its standards of production.

Inferences

82. Though any of the above mentioned models cannot be implemented in totality but certain parts may be recommended to ensure a steady pace for indigenisation of defence production. The following measures need to be implemented:-(a)There is an urgent need to establish a bridge between the private and public sector, this task may be delegated to the National Defence Manufacturing Commission. The commission would also be responsible for implementing policies and advising the GoI on policy issues. (b)The monopolistic advantage to the public sector in the indigenous defence industry needs to be done away with. The GoI needs to create an open bidding system for both the public and the private sector which would in turn breed competition and enhance self reliance.(c)The FDI policy for the defence manufacturing sector needs to be deliberated upon with a permissible limit of FDI being 49 percent.(d)Single window procurement

procedure for the DPSUs needs to be implemented for engaging the private sector more comprehensively.(e)Technology access to the government funded R&D needs to be provided to the private sector which would enhance the indigenous R&D base and would help in improving the technologies being developed in the country.(f)RUR status as stated earlier needs to be implemented on a priority basis.(g)Defence ITIs for enhancement of skills need to be set up for enhancing the skill levels of the defence industry. (h)The GoI needs to fund the R&D or a part of it for the private sector in order to develop home grown technologies.(j)Support to SMEs needs to be provided in terms of soft loans for their modernisation and better quality control.

CHAPTER VII: RECOMMENDATIONS

83. India after realising the deficit of a sturdy defence industrial base, has moved on a path of privatisation of the defence industry. This so called privatisation of the defence industry is yet far from what is desired for achieving a target of 70 percent self reliance in defence production. The enormous amounts of defence imports which the country is undertaking has resulted in the outflow of valued capital to foreign countries leaving our own industries in a dry state as far as defence production is concerned. As of now the industry is incapable of supporting our domestic needs and defence exports looks to be a far-fetched dream. 84. Some of the steps which need to be taken by the country as a whole have been covered in succeeding paragraphs.

Transformation of the Public Sector

85. Performance enhancement of DRDO. The DRDO has been the prime agency for defence R&D since the fifty's. Though, it has mainly focussed on home grown core technologies which otherwise would be unavailable in the open market and to a large extent has been successful in developing weapon systems and technologies which otherwise would have been denied by foreign manufacturers, yet much is left to be desired from the organisation. Some recommendations for performance enhancement of the organisation are listed below:-

(a) Accepting unrealistic qualitative requirements. The DRDO accepts unrealistic qualitative requirements from the user and then fails to produce the desired result. At the inception stage of the project only the qualitative requirements should be crystallised and the DRDO should be able to reject unrealistic or far-fetched requirements of the user.

(b) Lack of cohesion and continuity. The DRDO labs work in isolation and many a times the same problem has to be solved again and again, also the timelines for project fructification are so long that it is impossible for a scientist to complete the project in his service tenure, and the new scientists may not have to start over again, but certainly take time to integrate into the project. It is suggested that cohesion be built in the DRDO labs by means of networked databases and also scientists be earmarked for projects from their formative years.

(c) Lack of accountability. The very fact that scientists are not taken to task or no administrative action is initiated in case a project fails or does not meet the user's requirements, showcases the lack of accountability in the organisation. Also, the performance of DRDO is judged by the professors from the IITs and every milestone is hailed as a success

whereas the project fails to deliver. This is because of the very fact that the DRDO sponsors research in these institutes which creates a climate of patronage. It is recommended that strict administrative action be initiated in case of project failures and an independent agency such as CAG be employed for performance analysis.

(d) Lack of practical experience. The scientists involved in developing weapon systems have no practical experience as to how the weapon system should function, hence there should be programs wherein the scientists get embedded with the user to gain experience and practical knowledge of the weapon system.

(e) Inability to attract and retain talent. The cream from IITs and top engineering colleges heads towards greener pastures offered by the private sector. The DRDO pay scales and work ethos are a major de-motivating factor for the younger generation. This certainly needs exponential improvement in order to attract and retain talent for futuristic R&D.

86. Increased efficiency of DPSUs. The DPSUs as of date have the lowest productivity per employee, in the manufacturing sector. This may generally be attributed to poor technological skills and lack of suitable managerial approach. The DPSUs need to be transformed into profit making entities rather than just being a capital intensive venture. The steps required to augment the production capacity and quality of the DPSUs are as under:-

(a) Streamlined procurement procedure. A centralised procurement procedure for sub-assemblies and components needs to be established with a single window delivery system. This system would ensure that the capabilities of private sector are efficiently utilised and would also engage the SMEs effectively.

(b) A level playing field. A culture of favouritism is prevalent in the defence industry as

far as the DPSUs are concerned. The very fact that the DPSUs have a say in what they can manufacture and whatever they cannot is left open for the private sector proves that the private sector today is getting a step motherly treatment. This system needs to be done away with and an open bidding system needs to be adopted.

(c) Defence ITIs. In order to improve the skill levels of the industry there is a need to establish defence ITIs for the workers of the DPSUs and subsequently the graduates from these can also be employed in the private sector.

87. Recommended policy changes. The present policies for defence production in the country are far from being comprehensive, these have numerous clauses which promote bureaucratic delays and procedural lapses on the part of the user as well as the manufacturer. In order to simplify the procedures involved in defence production as well as effectively engage the private sector some necessary amendment are recommended below:-

(a) The DPrP should be comprehensively drafted and should specify the fields for indigenisation of defence production. The policy as of now is mute on the subject and has also not specified any timelines to this effect.

(b) An agency should be nominated by the DPrP, which should act as an interface between the armed forces and the industry for formulation of technical specifications.

(c) The award of RUR status should form a part of the DPrP and should be implemented on priority.

(d) The DPP needs to be simplified and the categories for product development need to be streamlined.

(e) The concept of offset multiplier and provisions of technology transfer need to be included in the offset policy for defence production.

(f) The FDI policy for the defence manufacturing sector needs to be deliberated upon with a permissible limit of FDI being 49

percent.(g)R&D forms the backbone of self-reliance, the DPrP should give out the percentage of R&D efforts required to be put in place by the private sector for highly capital intensive projects.

Engaging the Private Sector

88. The private sector as of date is not being effectively engaged by the Gol as far as defence production is concerned. The sector has tremendous potential not only to fulfil the nations demands but to also export defence equipment and bring in much desired foreign exchange revenues. As of now the policy issues highlighted above and the general infrastructure present in the country is not suitable for highend investments in the defence manufacturing sector. Certain steps which need to be taken for ensuring that the private sector achieves its growth potential are stated below:-

(a)Interface between public and private sector. There is an urgent need to establish a bridge between the private and public sector, this task may be delegated to the National Defence Manufacturing Commission. The commission would also be responsible for implementing policies and advising the Gol on policy issues.(b)Technology access. Technology access to the government funded R&D needs to be provided to the private sector which would enhance the indigenous R&D base and would help in improving the technologies being developed in the country.(c)R&D funding. The Gol needs to fund the R&D or a part of it for the private sector in order to develop home grown technologies.(d)Support to SMEs. Support to SMEs needs to be provided in terms of soft loans for their modernisation and better quality control.(e)Certification organisations to be strengthened. The organisations providing certification to the manufacturing units determine the health of the

industry. These organisations need to be strengthened by improving their technological and skill levels.(f)Vendor base development. Most of the components and sub-assemblies today are being outsourced by the DPSUs and the shipyards from the SMEs of the private sector. There should be constant endeavour to strengthen this vendor base in order to ensure continuity and availability. 89. The measures enumerated above are just a few steps which are relevant for the industry today. With changing times and the prevalent market conditions there would be a need to constantly review the policies further and take necessary measures to enhance productivity and growth of the defence manufacturing sector.

CHAPTER VIII: CONCLUSION

90. The first requisite for change is a vision for the future as the nation has begun its tryst with the emerging world order. The country is passing through a critical phase of economic renaissance. At such a juncture, an integrated view of defence and economic development is essential. So far we have been looking at defence needs, acquisition processes and economic competitiveness in two different perspectives. A country wanting to be self reliant cannot view defence needs in isolation from external threat, commercial and technological capability and economic competitiveness. 91. There is an urgent need to implement steps which would integrate the public and the private sector. With the implementation of strategy of integration, the GoI will link up with private sector for mutual sustenance, enhanced national strength, strong national security and irreversible economic competitiveness. We can envision a world in which investment in dual use technology becomes the order of the day in national agenda. 92. Changes of

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magnitudes as stated in the recommendations part cannot take place unless there is a national will and determination to see them through. One should not be under a delusion that the kind of sea changes required can occur overnight or even in a few years. It is therefore essential that at macro level, these changes be accepted by the service headquarters and then projected to the Ministry of Defence. Since these changes have wide ramifications, the following action plan is proposed:-(a)Form a joint committee to finalise an action plan to streamline the policies and procedures for defence production. (b)Submit a report to Ministry of Defence for consultation with other concerned ministries.(c)Form a core group consisting of representatives from the concerned ministries, services and DRDO to interact with leading industrialists of private sector. Conduct frank and meaningful discussions to decide an action plan for integrating the private sector with the public sector.(d)Embark upon a programme to build a strong technological base for the defence industry to meet the economic and national security challenges of the present security dynamics.(e)Enact necessary legislative regulation to give these reforms a permanent, workable and legal perspective. 93. In this paper, a detailed micro and macro level analysis has been carried out and certain shortcomings in defence manufacturing sector have been uncovered, calling for urgent radical action. The present policies and practices need revision and this aspect has been amply brought out in the recommendations stated earlier. 94. 'Trifles make no perfection, and perfection is not trifle'. What defence production sector has achieved is a large number of trifles, but perfection is a dream. It is 'the pursuit to excellence' which should be the guiding beacon for our defence

manufacturing entities and the day is not far when the nation will be proud of their achievements.