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INDIAN DEFENCE INDUSTRY
ISSUES OF SELF-RELIANCE

Laxman Kumar Behera

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INSTITUTE FOR DEFENCE
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Cover: The Agni-V Missile passes through the Rajpath during the full dress rehearsal for the Republic Day Parade-2013, in New Delhi on January 23, 2013. *Courtesy:* Press Information Bureau, Government of India

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Contents

PREFACE

Over the years, India has established a vast defence industrial base (DIB) which now consists of 52 research laboratories and establishments, nine Defence Public Sector Undertakings, and 39-odd Ordnance Factories. These entities, together with a small but growing private sector, are responsible for design, development, and production of various arms and armaments. However, the overall performance of the DIB in terms of meeting the requirements of the armed forces is below optimal. This has resulted in India spending billions of dollars each year on arms import, with the country achieving the dubious distinction of being one of the largest arms importers in the world.

The heavy dependency on external sources is contrary to the objective of self-reliance that the country had set for itself a long time ago. Way back in 1992, a self-reliance committee under the chairmanship of Dr A.P.J. Abdul Kalam, the then Scientific Advisor to the Defence Minster, had visualised that self-reliance index-measured in terms of percentage share of domestic procurement in total procurement expenditure would progressively increase from then 30 per cent to 70 per cent by 2005. The target has not been achieved even today. What is even more bewildering is not only the poor level of self-reliance but also the lack of concrete evidence in the public domain to measure its progress, leading to wide variation in estimates put by various groups.

To enhance the self-reliance index, the Ministry of Defence (MoD) has taken or contemplated various policy measures. In 2001, the government liberalised the defence industry by allowing 100 per cent participation by the Indian private sector and foreign direct investment up to 26 per cent. The government has also created opportunities for domestic enterprises to participate in defence contracts through the successive revision of its defence procurement procedures(DPP). In 2005, the MoD articulated an offset policy which has been elaborated and revised several times. The policy intends to give a fillip to domestic companies

through mandatory investment by foreign companies winning defence contracts from the MoD. The DPP has also created categories such as 'Make' and 'Buy and Make (Indian)' which give exclusive rights to Indian companies to participate in arms contracts. Recently, the MoD has articulated the first ever defence production policy and joint venture guidelines to facilitate more indigenous production. In addition, the DPP still retains the guidelines for selection of Raksha Udyog Ratnas (RUR) from among the private sector. The intention of the RUR is to create and nurture a select number of private companies which would assume the role of system integrator.

In the above context, this monograph makes an attempt to look into various aspects of India's attempt towards self-reliance. The monograph contains five chapters. Chapter I provides an overview of the Indian defence industry. Chapter II deals with India's approach towards self-reliance. It also tries to estimate the current self-reliance index by using the methodology devised by the Kalam Committee. Chapter III reviews the policy measures suggested by various committees set up by Indian government. Chapter IV critically examines all the policy measures that the government has taken or contemplated in recent years to enhance self-reliance. Chapter V recommends some policy measures that need to be taken to strengthen the Indian defence industrial base and enhance self-reliance.

[This Monograph was written before the announcement of the DPP-2013. Some of the concerns and issues raised in the monograph have been addressed in the latest DPP.*]

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* For an overview of the DPP-2013's new provisions and their implications see Laxman K Behera, Amendments to DPP-2011: *An Analytical Overview*, IDSA Issue Brief, May 06, 2013.

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Laxman Kumar Behera, Ph. D

Chapter I

Indian Defence Industry
an Overview

India has one of the largest defence industrial complexes in the developing world. At present, it consists of 39 Ordnance Factories (OFs) (with two more in the pipeline), nine Defence Public Sector Undertakings (DPSUs), and a small but emerging private sector. In addition, there are 50-odd defence research and development (R&D) laboratories under the umbrella Defence Research and Development Organisation (DRDO) which is responsible for designing and developing armaments for the armed forces. The Indian industry as a whole produces a wide range of items, ranging from small arms and ammunition to fighter aircraft, frigates, submarines, tanks, radars, and other defence-related items. However, most of India's arms production is undertaken by state-owned enterprises (DPSUs and OFs) which are not only established pla yers in the armament sector but had exclusive rights for defence manufacturing till 2001 when the industry was opened to the private sector. With 1,80,044 employees (81,130 in DPSUs and 98,914 in OFs), these government-owned entities produced armaments and related items worth Rs 47,785 crore ($ 10.5 billion) in 2010-11.

1.1 Ordnance Factories

The Ordnance Factories Organisation is the largest and oldest departmentally run defence production enterprise in India. The history of the organisation dates back to British rule in India when the first factory, i.e., the Gun Carriage Agency (presently known as the Gun & Shell Factory) was established in 1801 at Cossipore, in Kolkota. Over the years, the number of factories has grown, with the focus of expansion taking place post-1962. The war with China, and the subsequent desire for self-reliance in defence production, led to the establishment of 16 new factories, compared to the five factories that were set up between 1949 and 1962. Apart from 39 factories that are in operation at 24 different locations spread all over India, two more factories are being set up. The 40th factory is being set up in Nalanda,

Bihar, for the production of Bimodular charges; and the 41st at Korwa, Uttar Pradesh, for the production of new generation carbines (see Annexure I for the state-wise distribution of OFs, and their main items of production, and sales).

The existing OFs are divided into the following five operating divisions based on the main products/technologies employed:

1. Ammunition & Explosives (A&E)—10 Factories
2. Weapons, Vehicles and Equipment (WV&E)—10 Factories
3. Materials and Components (M&C)—9 Factories
4. Armoured Vehicles (AV)—5 Factories
5. Ordnance Equipment Group of Factories (OEF)—5 Factories

These OFs produce a wide range of defence hardware, categorised under the following item groups (Table 1.1).

Table 1.1: Product Range of OFs

1	Weapon Items	Small Arms (Rifles, Pistols, Carbines, Machine Guns), Tank Guns, Anti-Tank Guns, Field Howitzers, Artillery Guns, Mortars, Air Defence Guns, and Rocket Launchers
2	Ammunition Items	Ammunitions for all the above weapon systems, Rockets, Missile Warheads, Mortar Bombs, Pyro-technique (Smoke, illuminating, Signal), Grenades and Bombs for Air Force, Naval Ammunition, Propellant and Fuses.
3	Armoured and Transport Vehicles	MBT *Arjun,* Tank T-72 *'Ajeya'*, Tank T-90 *'Bhishma'*, Infantry Combat Vehicles, Armoured Ambulance, Bullet Proof and Mine Proof Vehicles, Special Transport Vehicles and Variants.
4	Troop Comfort Items	Parachutes for the Army and Air Force, High Altitude and Combat Clothing, Tents of Various Types, Uniforms and Clothing Items, Floats for Light Assault Bridges.

cont...

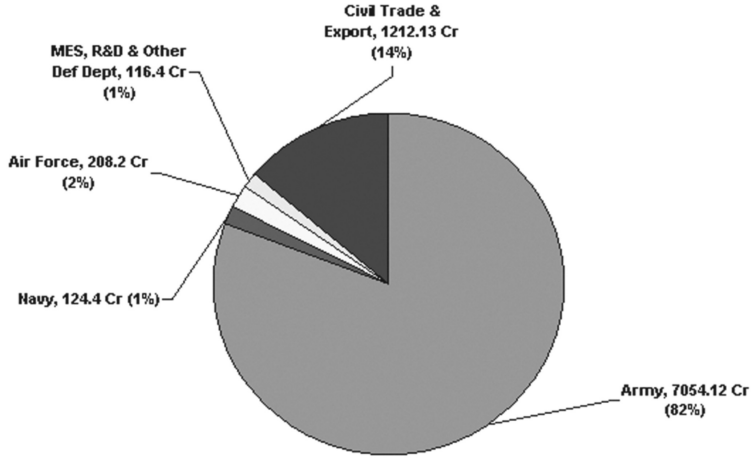
5	Opto Electronics	Optical Instruments and Opto-Electronic Devices, Fire Control Instruments for Armoured Vehicles, Infantry and Artillery Systems.
6	Others	Special Aluminium alloys for the aviation and space industry, Field Cables, Water Bowser, etc.

Source: Standing Committee on Defence, 14th Lok Sabha, *Indigenisation of Defence Production: Public Private Partnership*, 33rd Report (Lok Sabha Secretariat: New Delhi, 2008), p. 7.

Production and Sales of OFs

Over the years, the OFs have increased both their production and sales values (see Table 1.2). The Indian armed forces (army, navy, and air force) are the main customers of the OFs, accounting for around 80-85 per cent of their sales in the last five years. The army is the largest customer of the OFs, accounting for 82 per cent of the OFs' total sales in 2009-10 (Figure 1).

Figure 1.1: OFs' value of and percentage-wise sales to indenters, 2009-10.



Source: Figure extrapolated from the Report of the Comptroller and Auditor General of India, Union Government (Defence Services), Army and Ordnance Factories, No. 24, of 2011-12, p. 84.

Table 1.2: Value of Production and Sales of OFs

Year	Value of Production (Rs in Crores)	Value of Sales (Rs in Crores)
2001-02	—	6031.00
2002-03	7908.69	6508.05
2003-04	8259.68	6523.87
2004-05	8332.00	6186.65
2005-06	8811.59	6891.68
2006-07	8282.72	6197.35
2007-08	9312.62	6937.81
2008-09	10610.40	7229.31
2009-10	11817.89	8715.26
2010-11	15389.58	11215.01

Note: Production figures stand for the gross value of production and are inclusive of Inter Factory Demands (IFD). IFD stands for the inter-factory supply of parts, components, and materials for final assembly/production. The value of production exclusive of IFD gives net value of production.

Source: Ministry of Defence, Government of India, *Annual Report* (relevant years).

Apart from sales to the defence forces, since 1986 the OFs are also engaged in civil trade and exports for the better utilisation of their capacities, and to lessen their dependence on budgetary support. Table 1.3 shows the OFs' achievements in respect of civil trade (excluding supplies to the ministry of home affairs and state police departments) and exports for the period 2000-01 to 2009-10. In the export market, besides maintaining their foothold in the traditional markets of Nepal, Thailand, Malaysia, Germany, Belgium, and Botswana, the OFs have also entered the markets of Turkey, Swaziland, USA, Chile, Colombia,

Suriname, and Egypt. In 2010-11 (up to February 2011), the OFs exported items worth Rs 35.70 crore to five countries (Table 1.4).

Table 1.3: Civil Trade and Exports of OFs

Year	Civil Trade (Rs in Crores)	Exports (Rs in Crores)
2000-01	220.22	11.79
2001-02	245.00	35.32
2002-03	274.19	59.52
2003-04	278.71	103.00
2004-05	248.78	58.00
2005-06	312.17	14.66
2006-07	298.56	15.12
2007-08	359.56	27.44
2008-09	329.30	41.07
2009-10	425.18	12.30

Source: Reports of the Comptroller and Auditor General of India (relevant years).

Table 1.4: OFs' Country-wise Exports, 2010-11 (Upto February 2011)

Country	Item of Export	Export Value (Rs in crores)
Indonesia	Brake Parachute Sukhoi	35.70
USA	Cartg 5.56 mm SS 109	
Oman	Brake Para Jaguar, Cable JWD-1	
Israel	Cartg 5.56 X 45 mm Insas	
Italy	AK 630 m	
Bangladesh	Fog Signal	

Source: Standing Committee on Defence (2010-11), 15th Lok Sabha, *Demands for Grants 2011-12*, 12th Report (Lok Sabha Secretariat: New Delhi, 2011), p. 52.

1.2 Defence Public Sector Undertakings

India has nine DPSUs. Unlike the OFs, which are departmentally run organisations, the DPSUs are corporate entities with relatively more financial and operational freedom. DPSUs are also larger and operate in the high-end technology spectrums such as aerospace, electronics and warships. Table 1.5 provides some key financial statistics of the DPSUs for 2010-11 (see Annexure II for values of production, sales, and profit after tax (PAT) of all the DPSUs from 2002-03 to 2011-12.

Table 1.5: Select Statistics of DPSUs, 2010-11

DPSUs	Value of Production (Rs in Cr)	Value of Sales (Rs in Cr)	No of Employees	Exports (Rs in Cr)	R&D Exp (Rs in Cr)	Order Book (Rs in Cr)	GOI's Share (%)
HAL	16450.84	13115.50	33681	237.39	986.96	68265	100
BEL	5520.80	5529.69	11180	185.86	388.18	23600	75.86
BEML	3795.07	3647.07	11798	217.51	94.13	…	53.87
MDL	2611.41	636.56	8090	0	…	…	100
GRSE	1053.30	546.22	4117	0	…	…	100
GSL	990.32	514.43	1667	0	…	1187	51.09*
HSL	603.44	652.14	3348	0	0	1108.21	100
BDL	910.98	939.16	2897	1.38	11.53	20000	100
MIDHANI	485.46	417.67	1121	0	2.77	726	100

Note: 1. …: Data not available

2. GOI: Government of India
3. *: Apart from GOI's share, MDL also owns 47.21 per cent equity share in GSL

Source: Author's database

Hindustan Aeronautics Ltd. (HAL)

Among the nine DPSUs, HAL is the largest and accounts for over half of all DPSUs' production and sales in 2010-11. Formed in 1964 by the merger of Hindustan Aircraft Limited and Aeronautics India

Limited, it has, over the years, evolved into a large aeronautics enterprise, presently comprising of five complexes: the Design Complex (for the design and development of fixed wing aircraft); the Bangalore Complex (for the production, repair, and overhaul of fixed wing aircraft/engine of Indian and Western origin); the MiG Complex (for the production, repair, and overhaul of fixed wing aircraft/engine of Russian origin); the Helicopter Complex (created in 2008 for the design, production, repair, and overhaul of helicopters); and the Accessories Complex (for the production, repair of accessories and avionics).[1] These complexes are further divided into 19 production units, and 10 R&D centres in eight locations in India. Apart from this, HAL has also formed 11 joint venture (JV) companies in collaboration with the major Indian and international companies, with a total equity investment of Rs 82.24 crore till the end of March 2012. HAL's share in these JVs is in the range of 48-50 per cent. In 2011-12, these JVs had a total turnover of Rs 189.9 crore, representing a loss (before tax) of Rs 8.7 crore.[2]

The poor performance of the JVs notwithstanding, HAL as a company has an impressive product track record, having manufactured15 types of aircraft/helicopters from in-house R&D, and 14 types under licence. HAL has also manufactured over 3658 aircraft/helicopters, 4178 engines, up-graded 272 aircraft, and overhauled over 9643 aircraft and 29,775 engines.[3]

In 2011-12, HAL produced 78 aircraft and helicopters, along with their engines and accessories. The major manufacturing programmes include the SU-30MKI, HAWK Advanced Jet Trainer (AJT), Advanced Light Helicopter (ALH), Dornier-228, Pilotless Target Aircraft (PTA), and the limited series production of Light Combat Aircraft (LCA) and Intermediate Jet Trainer (IJT).[4] In the previous year, HAL's order book amounted to Rs 68,265 crore. This is set to increase further, with the medium multi-role combat aircraft (MMRCA) contract for 126

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1 Hindustan Aeronautics Ltd, *Annual Report, 2010-11*, p. 43.

2 Hindustan Aeronautics Ltd, *Annual Report 2011-12*, pp. 27-28

3 Hindustan Aeronautics Ltd,"About Us",http://www.hal-india.com/down-the-years.asp

4 Hindustan Aeronautics Ltd, Note 1, pp. 20-21.

fighters poised for finalisation in early 2013. Of the total number of fighters, 108 fighters are planned for licence-production by HAL. As per some estimates, the value of the MMRCA tender—in which the French Rafale has been declared the lowest bidder—is around Rs 76,000 crore ($15 billion).[5]

HAL's future production projects include: additional SU-30MKIs, Fifth Generation Fighter Aircraft (FGFA), Multi-Role Transport Aircraft (MTA), and the HTT-40 trainer. The additional SU-30MKIs were part of the Rs 25,000 crore defence contract signed between India and Russia during President Vladimir Putin's New Delhi visit in December 2012.[6] As per the agreement, HAL will build 42 more of these planes, thus taking its total production of the fighter to 222.[7]

The work on FGFA—a collaboration between HAL and Sukhoi Design Bureau and Rosoboronexport of Russia—started in December 2010, with the signing of the Preliminary Design (PD) contract with Russia. The PD phase will cost $295 million, and is expected to be completed in 18 months.[8]

The MTA project took off in December 2010, with the incorporation of the Multi-Role Transport Aircraft Ltd, a JV company. The project is envisaged as a co-design, co-development, and co-production programme between the Indian and Russian partners to meet the requirement of air forces of both the countries. The project, with an outlay of $600.7 million, will be funded equally by India and Russia.[9]

HAL has envisaged the indigenous development of a basic turbo-prop trainer (HTT-40) to replace the existing trainer aircraft HPT-32.

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5 Rahul Bedi, 'Platform capabilities, price and politics play role in Rafale's MMRCA win', *Jane's Defence Weekly,* February 03, 2012

6 Apart from additional SU-30 MKIs, the deal also includes 71 additional Mi-17 V5 helicopters. 'India, Russia sign defence deals worth Rs 25,000 crore', *The Times of India*, December 25, 2012

7 Hindustan Aeronautics Ltd, 'HAL Signs Contract for 42 Su-30 Supersonic Fighters with Rosobornexport & MOD on the Eve of Russian President's Visit to India', Press Release, December 24, 2012

8 According to HAL, FGFA '…will be equipped with features like stealth, high-technology avionics and ultra-manoeuvrability', Hindustan Aeronautics Ltd, Note 1, pp. 24-25.

9 Ibid, p.14.

The project is in the final stages of approval by the government. The aircraft is expected to be developed within a time frame of 62 months.[10]

Bharat Electronics Ltd. (BEL)

Established in Bangalore in 1954 by the ministry of defence, BEL is the premier defence electronics company, with nine production units and 31 manufacturing divisions, across seven states. From the initial production of transceivers for the Indian army's radio communication equipment, the organisation now has 350 products to its credit, including high-tech products such as radars, sonars, communication equipment, electronics warfare equipment, opto electronics, tank electronics, and components, among others. BEL is among the public sector enterprises that have been recognised for 'path-breaking innovations and new products' in recent times. The company won the SCOPE (Standing Conference of Public Enterprises) award for development of products such as the 'Battlefield Surveillance System, the Artillery Combat Command & Control System, the ATM-based Integrated Ship-borne Data Network, Frequency Hopping Radios, Secured Hand-held VHF/UHF Radios, and the upgraded Electronic Voting Machine.' In 2010-11, major projects executed by BEL included Artillery Combat Command Control System, Surveillance Radar Element, 3-D Central Acquisition Radar (Rohini), Combat Net Radio, Battle Field Surveillance Radar, and the Composite Communication System, among others. While defence forces remain the prime customers of BEL, para-military organisations such as the Border Security Force, Assam Rifles, and Central Industrial Force and civilian organisations like BSNL, AAI, and ECI—also buy its products. In 2011-12, the civilian sector accounted for 27 per cent of BEL's total business.

It is noteworthy that, BEL appears to be more focused on indigenisation than other DPSUs. In 2011-12, indigenously developed products contributed 81 per cent to the turnover, 54 per cent of which was from in-house developments, and 27 per cent from products developed by other indigenous agencies. Products using foreign technology accounted for the remaining 19 per cent of the turnover.[11]

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[10] Ibid

[11] Bharat Electronics Ltd, *Annual Report 2011-12*, p. 1.

BEML

BEML came into being in 1964, and commenced production of rail coaches and the assembly of space parts at its Bangalore unit a year later. The company with three product segments – Mining & Construction Equipment, Defence Equipment & Aggregates and Railway Rolling Stock - caters to the core needs of the civil industry (mining, steel, cement and power plants), defence services (trucks, diesel engines, and earth movers), and railways. Over the past few years, the civilian sector has come to form the core business focus of BEML- particularly the railways and metro trains. For example, in 2005-06, the defence segment accounted for 32 per cent of the company's total turnover. In 2011-12, this came down to 12.47 per cent of the total turnover.[12]

Mazagon Dock Limited (MDL)

MDL is the leading defence shipyard under the MoD, with the capability of constructing warships of 6500 dead weight ton (DWT) and merchant ships up to 27000 DWT.[13] Since its incorporation in 1960 as a defence PSU, the shipyard has developed into a frontline warship builder, with a product range that boasts of all types of ships, including destroyers, frigates, corvettes, and submarines. It is the only shipyard in India—and among the few in the world—to have constructed a submarine. With a workforce of 8090, including 1060 officers, 6038 industrial employees, the shipyard's infrastructure consists of three dry docks, four slipways, and three wet basins. Its shipbuilding capacity is expected to increase in the coming years, with the completion of the on-going modernisation plan involving an investment of Rs 1495 crore[14] The modernisation plan includes the infusion of modular construction technology, the construction of a new wet basin, and of an additional cradle shop for submarine production.[15] Major ships presently under construction by MDL include three ships of the P15A

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12 BEML, *Annual Reports*, 2005-06 and 2011-12.

13 Standing Committee on Defence (2005-06), 14th Lok Sabha, *Defence Public Sector Undertakings*, 9th Report (Lok Sabha Secretariat: New Delhi, 2006), p. 62.

14 Ministry of Defence, Government of India, *Annual Report 2010-11*, p. 69.

15 Ibid

(Destroyer) Class, four ships of the P15B class, and six Scorpene class submarines.

Garden Reach Shipbuilders and Engineers (GRSE)

GRSE was acquired by the MoD in 1960, with the primary objective of developing a second line of frigate construction. However, the construction of frigates has so far been limited to three ships (P-16A class), which were delivered to the navy between 2000 and 2005. The other ships built by GRSE include corvettes, fleet tankers, fast attack craft, and patrol ships, among others. It got its most high profile shipbuilding order in 2003, when the government sanctioned the construction of four anti-submarine warfare (ASW) Corvettes (P28 class), at an estimated cost of Rs 3051 crore. The shipyard has also signed a Rs 2100 crore contract with the navy for the construction of 8 Landing Utility Craft (LCU).[16] Presently, GRSE is undertaking a comprehensive modernisation plan. An investment of Rs 606 crore is being made for upgrading infrastructure to enable the shipyard to reduce the build-period of ship construction and double its shipbuilding capacity.[17]

Goa Shipyard Ltd. (GSL)

GSL is the smallest shipyard under the MoD, and has expertise in building medium-sized vessels for the navy, coast guard and others. The shipyard was a small barge repair facility that was established in 1957 by the Portuguese. Following the liberation of Goa in the early part of following decade, it was leased to MDL which controlled the shipyard till 1967. GSL has the capability to build ships up to 105 metres length, 3000 ton DWT, and 4.5 metres draught. Its product range includes Fast Patrol Vessels, Survey Vessels, Sail Training Ships, Missile Crafts, and Offshore Patrol Vessels. Like other defence shipyards, GSL is also on a modernisation drive, with the objective of enhancing its shipbuilding capability by 200 per cent. The modernisation plan,

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[16] Press Information Bureau, Government of India, 'Navy Orders Eight Amphibious Assault Vessels', September 30, 2011.

[17] Ministry of Defence, Government of India, Note 14, p. 65

which is being carried out in four phases, involves an estimated outlay of Rs 792 crore.[18]

Hindustan Shipyard Ltd. (HSL)

HSL, one of the oldest and largest shipyards in the public sector, was transferred to the MoD from the ministry of shipping in February 2010. Having so far built 163 ships, and repaired nearly 1850 ships of various types, the shipyard has also a degree of experience in warship building. It has built Offshore Patrol Vessels and Inshore Patrol Vessels for the Indian navy, besides refitting the navy's submarines. When acquired by the MoD, the shipyard was incurring financial losses totalling Rs 987 crore as on March 31, 2009. The MoD has proposed a Rs 1192 crore financial restructuring plan for the shipyard.[19] The department of defence production of the MoD, in consultation with the navy and the DRDO, has also prepared a massive plan to modernise the shipyard to enable it to construct advanced vessels such as landing platform decks, conventional and strategic submarines. In the commercial sector, it is presently building six vessels, each of 53,000 DWT (its biggest ship so far) for Good Earth Maritime Ltd.[20]

Bharat Dynamics Ltd. (BDL)

BDL was carved out of the DRDO, and established as a separate DPSU in 1970. It builds strategic and tactical missiles, underwater and aerial weapons, either under the license or technologies supplied by the DRDO. Its licence-manufactured products include the Milan (France) and Konkurs (Russia) anti-tank guided missiles (ATGM). The company came into prominence with the launch of India's Integrated Guided Missile Programme (IGMP) in the early 1980s.[21] BDL was the designated production agency under the programme. It has so far supplied both the land and naval versions of Prithvi missiles (range150

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18 Ibid, p.67.

19 Ministry of Defence, Government of India, *Annual Report 2009-10*, p. 67.

20 Ministry of Defence, Government of India, Note 14, p. 68

21 The IGMDP, sanctioned in 1983, encompasses five missile systems: Prithvi (150 & 250 km range surface-to-surface), Akash (25 km surface-to-air), Trishul (surface-to-air), Nag (fire & forget anti-tank) and Agni (surface to surface). The latter was intended as a technology demonstrator.

km and 250 km), and Agni I & II (range 700 km and more than 2000 km) to the Indian armed forces. In addition to the above, BDL is also involved in a number of other DRDO projects, such as the K-15 submarine launched ballistic missile (SLBM) and ASTRA beyond visual air-to-air missile. In 2010-11, BDL got an order of Rs 14,180 crore for the supply of surface-to-air missiles to the Indian army.[22]

Mishra Dhatu Nigam Ltd. (MIDHANI)

MIDHANI was incorporated as a PSU in 1973 for achieving self-reliance in special steels, super alloys, titanium alloys that are the core requirements not only of the defence but of space and atomic energy programmes. In the defence sector, MIDHANI is responsible for the indigenisation of technologies and products to support projects such as the T-72, MBT Arjun, Kaveri engine (for Light Combat Aircraft), nuclear submarine and MiG fighters. In 2010-11, defence, space and atomic sectors accounted for 84 per cent of its total supplies[23]

1.3 Private Sector

In May 2001, the Indian government, in a landmark decision, opened up the defence production sector- hither to reserved for the state-owned entities such as DPSUs and OFs- to the private sector. The decision was conveyed through Press Note No. 4 (2001 Series), and the detailed guidelines were provided in Press Note No. 2 (2002 Series).[24] Among others, the private sector was allowed to produce any defence item, with foreign direct investment (FDI) up to 26 per cent. Both these provisions were, however, subject to industrial licencing and security clearance (the detailed guidelines for licencing the production of arms and ammunitions are provided in Annexure III).

Consequent to the 2001 decision, there has been a perceptible change in the mindset of the private sector with regard to defence production.

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22 Bharat Dynamics Ltd, *Annual Report 2010-11*, p. 9.

23 Mishra Dhatu Nigam Ltd, *Annual Report 2010-11*, p. 57.

24 All the Press Notes are now put in one comprehensive *Consolidated FDI Policy* document. For the latest document (effective from April 10, 2012), see Department of Industrial Policy and Promotion, Ministry of Commerce, Government of India, http://dipp.nic.in/English/Policies/FDI_Circular_01_2012.pdf

This is apparent at least on two fronts. The first relates to the expression of interest to produce defence items. By October 2011, 205 Letters of Intent/Industrial Licenses (LoI/IL) had been issued by the department of industrial policy and promotion (DIPP) of the ministry of commerce to various private entities, with a proposed investment of Rs 11,889 crore, and with employment opportunities for 39,129 people.[25] More importantly, these LoI/IL are for a wide range of defence products including armoured and combat vehicles, radars, electronic warfare equipment, warships, submarine, avionics, military aircraft, safety & ballistic products, and armaments and ammunition, among others.[26]

It is also worth noting that following the liberalisation of the defence industry, the private sector has had some success not only in the domestic market but also on the international front. The big success for the private sector came in May 2011 when the private shipyard, Pipavav Defence and Offshore Engineering Company (formerly Pipavav Shipyard), won a fiercely contested naval order valued at Rs 2,975 crore for building five naval offshore patrol vessels (NOPV) for the Indian navy.[27] Pipavav was competing with the state-owned shipyard, GSL, which has expertise in building similar vessels and is currently executing a naval order for four NOPVs, with the first ship being commissioned in January 2013.[28]

The naval success was repeated in an army contract in early April 2013, when a consortium of two private firms – L&T and Ashok Leyland –emerged as the lowest bidder in a Rs 100 crore tender for refurbished rocket launchers mounted on specialised trucks for the army. The tender

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[25] Department of Industrial Policy and Promotion, Ministry of Commerce, Government of India.

[26] Ministry of Defence, Government of India, 'List of Letters of Intent/Industrial Licence issued to private companies for the manufacture of Arms and Armament', http://mod.nic.in/

[27] Pipavav Defence and Offshore Engineering Company Limited, *Annual Report 2010-11*, p. 2.

[28] "INS Saryu commissioned into Indian Navy", *The Times of India*, January 23, 2013, http://articles.timesofindia.indiatimes.com/2013-01-22/goa/36483316_1_air-marshal-roy-nopvs-naval-offshore-patrol-vessel

also saw the participation of other players, including a team consisting of Tatra, BEML and BEL, which lost along with another team comprising of the Tata group of companies (Tata Motors and Tata Power SED). The tender is significant because it 'could be the beginning of the end of a decades-old monopoly' of controversial Tatra trucks, which are licence manufactured by the state-owned BEML and are the mainstay of the Indian armed forces as all-terrain vehicles and mobility platforms for weapons systems. Major private truck manufacturers (Tata Motors, Ashok Leyland and L&T) are also bidding in three more tenders for as many as 1594 specialised vehicles including the 6- and 8-wheel drive high mobility trucks.[29] If they succeed in bagging these contracts, it will mean the end India's dependence on extemals sources for military trucks.

Among all the major domestic orders bagged by the Indian private sector, the contract won by the Tata Power's Strategic Electronic Division (Tata Power SED) in early 2011 for the modernisation of 30 Indian air force airbases, is the most significant on several counts. Valued at Rs 1094 crore, the contract is the second largest defence contract (after Pipavav's NOPV order) to be awarded to any Indian private entity. More importantly, Tata won the contract against not only established domestic players like BEL but also international companies, including the Italian giant Selex Sistemi Integrati (a subsidiary of *Finmeccanica*) who lost the bid by a narrow margin.[30]

The first major success for the Indian private sector in international arms market came in 2012, when Pipavav secured a major export order valued at Rs. 1192 crore from an undisclosed West African country for the supply of two Offshore Patrol Vessels. The export order is likely to go up to Rs. 2504 crore, with the option of the supply of two

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29 Sruthijith K.K, "Army trucks: Ashok Leyland-L&T consortium emerges lowest bidder for Rs 100-cr contract", *The Economic Times*, April 06, 2013, http://articles.economictimes.indiatimes.com/2013-04-06/news/38327335_1_tatra-rocket-launchers-ravi-rishi

30 'Tata Power Wins Prestigious Contract for Modernisation of IAF Airbases', *DefenceNow*, April 11, 2011, http://www.defencenow.com/news/138/tata-power-wins-prestigious-contract-for-modernization-of-iaf-airbases.html

more warships being part of the contract.[31] The private shipyard's export success has been followed by that of Samtel Avionics and Defence Systems, a private defence electronics company which signed a Rs. 500 crore contract with the UK-based Curtiss-Wright Controls Defence Solutions for the supply of high-definition, rugged liquid crystal cockpit displays in September 2012.[32]

Table 1.6: Partnerships between Indian Private Companies and Foreign OEMs

Indian Company	Foreign OEM	Work Domain
TATA Group	Sikorsky Aircraft Corporation	S-92 Helicopter cabins
	IsraelAerospace Industries	Manufacture and defence products
	EADS	Advanced tactical communication systems
	Thales	Optronic solutions for multi-role combat aircraft
		Aerospace component work
Larsen & Toubro	Boeing	P-8I reconnaissance planes, naval systems
	EADS	Manufacture high-end defence electronics
	Raytheon	Upgrade of T-72 tanks
	Pratt & Whitney	Aircraft engine components
	Fincanteri	Fleet refuelling tankers, naval systems
WIPRO	BAES	Commercial aerospace projects

cont...

[31] 'Pipavav bags two international orders worth Rs 1,192 crore', *The Economic Times*, August 6, 2012

[32] Biswarup Gooptu and Peerzada Abrar, 'Samtel Avionics, Defence Systems bag Rs 500-cr order from UK-based Curtiss-Wright Controls Defense Solutions', *The Economic Times*, September 17, 2012.

Mahindra Group	BAES[33]	Up-armoured light vehicles, specialist military vehicles, mine protected vehicles, artillery systems
	Lockheed Martin UK Information System[34]	Simulators
	Telephonic Corporation	Radars and electronics
Precision Electronics	Raytheon	Developing and providing communication technology
Dynamatic Technologies	Boeing	Manufacturing cabinets for housing critical equipment on Boeing's P-8I aircraft
Pipavav	Saab	Naval combat system design and architecture
	Babcock	Warships
Bharat Forge	Elbit	Artillery and mortars systems solutions
Reliance Industries Ltd	Dassault Aviation	Defence and homeland security

Source: KPMG & CII, *Unlocking the Potential: The Indian Aerospace and Defence Sector*, p. 9; and media reports

The serious interest of the private sector in the defence industry is also evident from the formation of various joint ventures and the signing of memorandums of understanding (MoUs) with a range of major global defence companies (Table 1.6). Moreover, some companies have gone to the extent of acquiring foreign defence-oriented companies. An oft cited example of such a partnership is the joint venture (JV) company formed by India's Mahindra Group with the UK's largest defence company, BAE Systems. The JV, with an initial

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[33] According to recent reports, the JV has been taken over by the Mahindra. See Jon Grevatt, 'Briefing: M&M buys out BAE Systems stake in joint venture', *Jane's Defence Industry*, February 11, 2013

[34] According to a 2004 report, the MoU between Mahindra and Lockheed Martin has been scrapped. 'Mahindra scraps defence deal with Lockheed', *The Times of India*, February 07, 2004.

strength of 50-60 people, was initially intended to produce a range of military vehicles. With regard to the acquisition of foreign companies, in December 2009, the Mahindra Group acquired a majority stake in two Australian defence companies, Aerostaff Australia and Gippsland Aeronautics, signalling its entry into the defence and aerospace business.[35]

1.4 Defence Research and Development Organisation (DRDO)

Formed in 1958 as an inspection agency, the Defence Research and Development Organisation (DRDO) has grown into a large organisation, with the key mandate of designing and developing state-of-the-art weapon systems required by the Indian armed forces. The organisation, with over 33,000 personnel, including 7,255 scientists and 13,370 technicians, has 52 laboratories and establishments across the country. These laboratories are working on defence and related technologies including aeronautics, armaments, missiles, combat vehicles, advanced computing and networking, electronics, opto-electronics, military engineering systems, life sciences, advanced materials, composites and underwater sensors/weapons and warships. Of these 50-odd laboratories, five are dedicated to missile systems; 12 to electronic systems; three to materials science; six to aeronautical systems; four to combat vehicles and engineering; 10 to life sciences, and three to naval systems. In addition, the DRDO has two societies: the Aeronautical Development Agency (ADA) and Society for Integrated Technology Applications & Research (SITAR). The primary role of ADA is to 'undertake design and development of advanced technology aircraft,' whereas that of SITAR is to design 'digital components and devices required for various projects including high performance computing.'

DRDO's Budget

DRDO's budget has increased over the years to Rs10,610.17 crores in 2013-14. This amounts to 5.21 per cent of the total defence budget—a significant increase over the decades of 1970s and 1980s, but a noticeable decrease with respect to 2007-08, when the DRDO accounted for 6.74 per cent of the total defence expenditure (Figure

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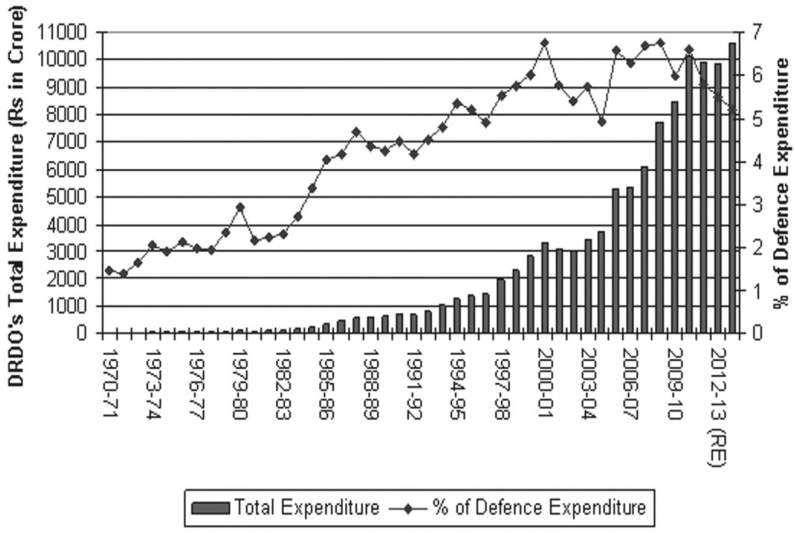
[35] 'Mahindra soars into the aerospace segment, acquires majority stake in two Australian companies', http://www.mfe.ag/typo3/index.php?id=118&L=0&L=0

1.2). The size of DRDO's budget, and its share in the defence budget, has given rise to some debate in India, with the Parliamentary Standing Committee on Defence in a 2007 report arguing for increasing the R&D expenditure to 14-15 per cent of the total defence budget.[36] Voicing his concerns over the latest budget, the chief of DRDO has noted that 'allocation would not be sufficient for progressing all projects simultaneously.' The concern is due to a shortfall of Rs 3,800 crore in the budgetary requirements projected to the government. The gap in the latest budgetary projection notwithstanding, DRDO has sought Rs 1,75,0000 crores for the 12th Five Year Plan (2012-2017).[37]

Figure 1.2: Trends in DRDO's Expenditure



Note: Figures for 2012-13 and 2013-14 are Revises Estimates and Budget Estimates, respectively.

Source: Figure prepared by author based on data from Ministry of Defence, *Defence Services Estimates* (various issues).

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[36] Standing Committee on Defence (2006-07), 14th Lok Sabha, *Defence Research and Development Organisation* (Lok Sabha Secretariat: New Delhi, 2007), p. 18.

[37] M. Somasekhar, 'DRDO seeks Rs. 1.75 lakh cr in 12th Plan period', *The Hindu Business Line*, July 10, 2012.

The details of the DRDO's budget are not publicly available except for some broad items of expenditure under the heads of revenue and capital expenditure. In 2012-13, some 55 per cent of DRDO's total allocation is meant for the procurement of machinery, equipment, and stores. Human resources account for a little over 21 per cent, including a meagre 0.1 per cent for training. The ADA—which is developing India's first ever combat aircraft—and extramural research account for about 11 per cent of the budget (Table 1.7).

Table 1.7: Heads of Expenditure of DRDO, 2012-13 (Rs in Crore)

Items of Expenditure		Rs in Crores	% of Total Budget
Revenue Expenditure	Training	15.4	0.1
	Extramural Research/ADA	1149.9	10.8
	Pay & Allowances	2237.2	21.0
	Transportation	137.5	1.3
	Stores	1759.4	16.5
	Works	546.5	5.1
	Other Expenditure	189.7	1.8
	Total Revenue Expenditure	6035.6	56.5
Capital Expenditure	Machinery & Equipment	4060.5	38.0
	Works	579.5	5.4
	Total Capital Expenditure	4640.0	43.5
Total (Revenue and Capital)		10675.6	100.0

Note: DRDO's total budget shown in the table is exclusive of receipts of Rs 40 crore.

Source: Ministry of Defence, Government of India, *Defence Services Estimates 2012-13*

Contribution of DRDO

Despite the modest budgetary allocation for defence R&D, the DRDO has been relatively successful in developing a range of technologies and products for the armed forces. According to an official estimate in March 2012, the production value of DRDO developed items is close to Rs 1,40,000 crores.[38] Some of the items have either been inducted or are in the process of induction. These include: missiles, the multi-barrel rocket launcher, unmanned aerial vehicles, radars, electronic warfare systems, sonars, torpedoes, combat vehicles, bridging systems, combat aircraft, sensors, nuclear, biological and chemical (NBC) technologies, parachutes, combat free fall system, propellants and explosives, detonators, and communication systems.

Despite the above successes, there have been delays and cost overruns in many of DRDO's flagship projects, including the ones sanctioned by the Cabinet Committee on Security (CCS), the highest decision making body in India on security matters (Table 1.8). Such delays and cost revisions are often explained in terms of 'change in scope, *ab-initio* development of the state-of-the-art technologies, technical/ technological complexities, build-up of test facilities, non-availability of critical components/equipment/materials, and the denial of technologies by technologically advanced countries, extended trials, increase in the cost of materials and manpower, etc.'[39] These reasons notwithstanding, there are voices - including from higher political authorities, - urging the DRDO to speed up projects and complete them in a time bound manner. For instance, in his address at a DRDO award giving function, Prime Minister Manmohan Singh urged the functionaries of the premier research organisation to "take a hard look at the pipeline of our projects and focus our time and material resources on selected areas…to deliver projects within reasonable time and cost."[40]

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[38] Defence Research and Development Organisation, 'Self reliance is "freedom from controls and denials"', Press Release, http://drdo.gov.in/drdo/English/dpi/press_release/DefExpo_2012_03_04_2012.pdf

[39] 'Time and Cost Overruns of DRDO Projects', Press Information Bureau, Government of India, August 13, 2012.

[40] 'PM's Address at DRDO Award Function', July 31, 2012, Prime Minister Office, http://pmindia.nic.in/index.php

Table 1.8: Time and Cost Overrun of CCS Projects

Projects	Probable Date of Completion (PDC)		Cost (Rs in Crore)	
	Original	Revised	Original	Revised
Light Combat Aircraft (LCA), Phase-II	Dec 2008	Dec 2012	3301.75	5777.53
Naval Light Combat Aircraft (LCA, Navy), Phase-I	Mar 2010	Dec 2014	948.90	1714.98
Aero-engine Kaveri	Dec 1996	Dec 2009*	383.81	2839.00
Airborne Early Warning & Control (AEW&C) System	Oct 2011	Mar 2014	1800.00	2157.00
Long Range Surface-to-Air Missile (LR-SAM)	May 2011	Dec 2015	2606.02	No revision.

* PDC has been extended within the sanctioned cost and scope

Source: Rajya Sabha, Parliament of India, Unstarred Question, No. 808, March 21, 2012.

1.5 Indian Defence Industry and Self-Reliance

As elaborated earlier, India has established a vast defence industrial base (DIB), with the basic objective of achieving self-reliance. To the credit of this vast DIB, India is among the few countries in the world that has developed, or is in the process of developing, a fourth plus generation fighter aircraft, an aircraft carrier, a nuclear submarine, a main battle tank, and the intercontinental ballistic missile (ICBM). However, at the same time, India is probably the only country in the world which, despite having a vast defence industrial base, still imports the majority of its armaments, including several low-tech items (including military transport vehicles), from external sources. This raises the question as to what extent has the Indian defence industry been successful in meeting the self-reliance objective. While an attempt is made in the next chapter to objectively examine the DIB's record in meeting this

objective, a general impression can also be made by looking at India's dependence on foreign armaments. As reported by various agencies, India's arms imports have been growing consistently over the years, giving the country the dubious distinction of being one of the largest arms importers in the world. According to the Stockholm International Peace Research Institute (SIPRI), India is the largest arms importer in the world, with a nine per cent global share in 2006-2010.[41] In 2003-2006, India was also ranked first among all the developing countries with an arms transfer agreement of $21.1 billion.[42] In comparison, China which was the largest importer of arms between 2002 and 2006, has now become the fifth largest arms exporter in the world, displacing the UK to the sixth position.[43] India's high import dependency in a way indicates the poor state of domestic defence industrial base which the present study makes an attempt to study in some detail.

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41 Paul Holtom et al, 'Trends in international arms transfers, 2010' *SIPRI Fact Sheet*, March 2011. It is to be noted that SIPRI uses Trend Indicator Value (TIV) for measuring trends in arms transfers. The TIV does not, however, reflect the financial value of arms transferred, leading to its critique by analysts. For a critique of TIV, see, G Balachandran, 'International Arms Transfers: A Study', in Jasjit Singh ed., *Conventional Arms Transfers*, Institute for Defence Studies and Analysis: New Delhi, 1995, p. 48-59.

42 Richard F. Grimmett, *Conventional Arms Transfers to Developing Nations, 2003-2010*, Congressional Research Service, R42017, September 22, 2011, p. 45.

43 Stockholm International Peace Research Institute, 'Rise in international arms transfers is driven by Asian demand, says SIPRI', Press Release, March 19, 2012; and 'China replaces UK as world's fifth largest arms exporter, says SIPRI', March 18, 2013

Chapter II

Self-Reliance
India's Approach and the Current Index

India's heavy dependence on arms imports has been a matter of concern for parliamentarians, oversight agencies, policy makers and defence analysts. Debating the state of defence preparedness, parliamentarians - cutting across the party lines - have voiced their concerns over the county's inability to meet its own defence needs, and the strategic vulnerability of depending on others.[1] In a 2011 report to the Parliament, the Comptroller and Auditor General of India (C&AG) highlighted the 90 per cent import dependency of Hindustan Aeronautics Ltd (HAL) for 'raw materials and bought out items' for the production of indigenous Advanced Light Helicopter (ALH) even though the helicopter has been in production for a decade.[2] Examining the low indigenisation levels in two of India's flagship indigenous programmes—MBT *Arjun* and the Light Combat Aircraft (LCA)—the Parliamentary Standing Committee on Defence has also expressed its concems.

The heavy dependence on arms import for the country's defence preparedness also belies the very objective of self-reliance. As early as 1992, a Self Reliance Review Committee (SRRV) under A.P.J. Abdul Kalam, then Scientific Advisor to the defence minister (later the President of India), had formulated a 10-year self-reliance plan after interactions with various stakeholders, including the armed forces and the MoD. As per the plan, the self-reliance index (SRI), defined as the percentage share of indigenous content in total procurement expenditure, was to progressively increase from 30 per cent in 1992-1993 to 70 per cent by 2005.[3] This target has not been achieved till today. While this has led to

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1 Rajya Sabha, Parliament of India, 225th Session, Uncorrected Debates, May 8, 2012.

2 Comptroller and Auditor General of India, Report No. 10 of 2010-11, http://cag.gov.in/html/reports/commercial/2010-11_10PA/chap3.pdf

3 Standing Committee on Defence 2006-07, 14th Lok Sabha, *Defence Research and Development Organisation (DRDO)*, 14th Report (Lok Sabha Secretariat: New Delhi, 2007), p. 3.

widespread concerns, there is no consensus on the precise level of self-reliance. Consequently, there has been a divergence of opinions and statements regarding the progress of self-reliance. While replying to a supplementary question in Parliament in July 2009, the defence minister stated that the level of self-reliance was only 30 per cent, which he termed 'shameful and dangerous'.[4] The chief of DRDO told the Standing Committee on Defence, which submitted its report to Parliament in April 2012, that self-reliance has gone up to 40-45 per cent.[5] However, in January 2013, the DRDO chief revised the SRI index to 55 per cent, on the basis of an estimate of the Economic Analysis Wing of the Government of India.[6] According to defence analyst G. Balachandran, the self-reliance index has indeed improved to a great extent. In an opinion piece written for a daily newspaper, he estimated that the level of self-reliance for the seven year period between 2001 and 2008 was 55 per cent ![7]

As noted earlier, there are significant variations in estimates of the self-reliance index. These could be attributed to the different methodologies employed and use of different sets of data. But what is indisputable is that since the constitution of SRRV, which proved to be an one-off affair, no effort seems to have been made by the concerned authorities to make a comprehensive review of its progress.

This chapter attempts to estimate the level of India's self-reliance in defence procurement. The chapter also examines the concept of self-reliance as understood in the Indian context, the data problems involved in estimating the index, and the methodology used to arrive at the index.

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4 Lok Sabha, Supplementary Question No. 222, 'Provision of Quality Materials to Soldiers', Answered on July 20, 2009.

5 Standing Committee on Defence 2011-12, 15th Lok Sabha, *Demands for Grants (2012"13)*, 15th Report (Lok Sabha Secretariat: New Delhi, 2012), p. 78.

6 'DRDO working on Rs. 6k cr AWACS project: Saraswat', *Deccan Chronicle*, January 26, 2013

7 G. Balachandran, 'In Defence of our Defence R&D', *The Indian Express*, May 21, 2010.

2.1 Self-Reliance in the Context of India's Defence Production

The terms 'self-sufficiency' and 'self-reliance' have been used interchangeably in the Indian context, although analysts have tried to differentiate between the two. The difference between the two terms was perhaps best defined by the late K. Subrahmanyam. According to him: 'Self-sufficiency in defence is the objective to strive for. Self-reliance can be just a fetish.'[8] He also observed that self-sufficiency means the in-house production of everything needed by the armed forces. He suggests that self-sufficiency as a concept is not suited for a country like India whose industrial and R&D base is 'not yet sufficiently developed' and whose capacity to spend on defence—including on risky and long-gestation R&D projects—is small compared to advanced countries.[9] According to him self-reliance was a more pragmatic approach because it meant 'equipping the armed forces with a whole range of equipments [which] may come from foreign or domestic sources.' He, however, cautioned that if the supplies come from external sources, the country must ensure that the operational exploitation and maintenance of the equipment should not be held hostage under all circumstances.[10]

Based on Subrahmanyam's definitional distinction, analysts have identified three phases in India's defence industrialisation process: first, from independence to the mid-1960s, when self-sufficiency was the overall economic principle governing India's industrial development; second, from the mid-1960s to the mid-1980s when the term self-reliance replaced self-sufficiency in defence production; and third, from late 1980s till date, when the emphasis in self-reliance has been on co-production.[11] Since the early 2000s another dimension has been added

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8 K. Subrahmanyam, *Shedding Shibboleths: India's Evolving Strategic Outlook* (Arthur Monteiro for Wordsmiths: Delhi, 2005), p. 38.

9 Ibid

10 K. Subrahmanyam, 'Self-Reliant Defence and Indian Industry', http://www.idsa-india.org/an-oct-00-2.html

11 Manjeet S. Pardesi and Ron Matthews, 'India's Tortuous Road to Defence Industrial Self-Reliance', *Defence and Security Analysis*, Vol. 23, No. 4, p. 421.

to the last phase: a greater emphasis on the participation of the Indian private sector in defence production.

India's defence industrialisation immediately after independence was influenced by the country's socialistic and centralised planning system in accordance with the first-ever Industrial Policy Resolution (IPR) adopted in 1948. The IPR of 1948 'emphasised the importance to the economy of securing a continuous increase in production and its equitable distribution, and pointed out the State must play an active role in development of industries.'[12]

The resolution of 1948 and its revised version of 1956 thus reserved the key industries—including for arms and ammunition, railways, air transport, and atomic energy—for the public sector, with the State retaining the exclusive responsibility for their development. Self-sufficiency in industrial production was the dominant principle during this phase, as the leadership of time believed that only state intervention could develop the de-industrialised economy after two centuries of British rule.

In the defence sector, the 18 ordnance factories of British India formed the core of the state-led defence industry. These factories were supported by a rudimentary R&D set up (which in 1958 became a full-fledged organisation - the DRDO); and the Hindustan Aircraft factory which was set up in Bangalore in 1940 by industrialist Walchand Hirachand, with the objective of promoting the aviation industry in India. The company was taken over by the USA for a brief period during the World War II for the repair and overhaul of its air assets. By 1945, when management control was handed over to the Indian government, it had overhauled 1171 aircraft (including C-47 cargo planes, B25 light bombers, B24 heavy bombers, and Catalinas) and 3800 engines.[13]

With this industrial base in place, self-sufficiency got a further boost following the 1954 US-Pakistan strategic partnership, and the border tension with China which intensified in the late 1950s. Responding to

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[12] Industrial Policy Resolution, http://eaindustry.nic.in/handbk/chap001.pdf

[13] Hindustan Aeronautics Limited, 'Glimpses of Traversed Path (1940-Till date)", http://www.hal-india.com/index.asp

the unfolding security scenario, the government expanded the defence industrial infrastructure. In 1954, a defence electronic company, Bharat Electronics, was set up with French assistance. The government also acquired two shipyards—Mazagon Dock Ltd and Garden Reach Shipyard— and placed them under the control of MoD for undertaking naval construction.

However, the self-sufficiency model chosen for defence production in the initial years post-Independence was limited in scope, and was partly influenced by the 1948 report of the British scientist P.M.S. Blackett who was invited by Prime Minister Nehru to advise the government on defence research and development requirements to make the country self-sufficient. Blackett's report, which was accepted by the government, offered a short-term plan of action envisaging the indigenous manufacture, in large quantities, of what he termed non-competitive weapons, while offering a long term plan for the production of high-performance and complex weapons (the latter category was termed competitive weapons). By non-competitive weapons, Blackett meant technologically simpler weapons such as light anti-aircraft guns, 25-pounder field guns, light tanks, motor transport, naval escort aircraft, transport aircraft and trainers; whereas the latter category included jet fighters, bombers, airborne radars, high altitude anti-aircraft guns, and heavy guns. Blackett believed that, given India's weak economy and low industrial base (whose output at that time was two per cent of the UK's), it did not have the requisite wherewithal to produce complex weapons systems. On the other hand, Blackett argued that bulk production of simpler weapons would largely compensate for competitive weapons, and provide 'an extremely valuable stimulus to the economy and present a very considerable step forward in industrialisation.'[14]

A vital component of Blackett's analysis pertained to fund allocation to national defence. Blackett was realistic in his assumption that defence allocation, accounted for a high 40 per cent of the central government

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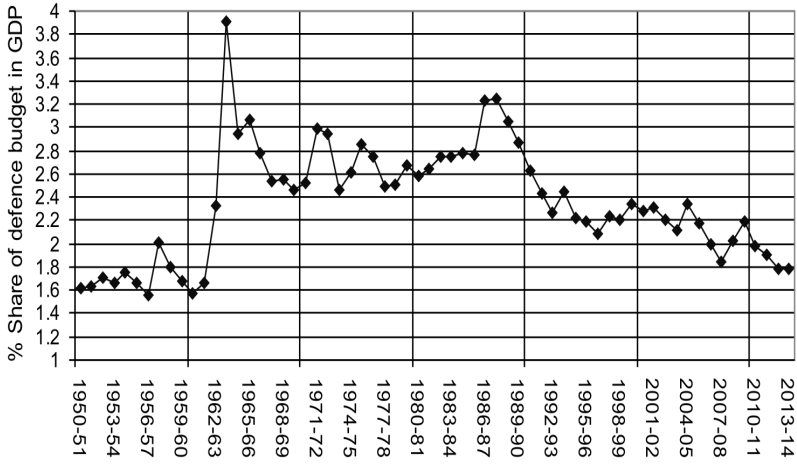
[14] Blackett's report as quoted in Ramdas P. Shenoy, *Defence Research and Development Organisation 1958-1982* (Defence Research and Development Organisation: New Delhi, 2006), pp. 16-22.

budget, and was unlikely to go beyond that level without affecting the industrialisation process and economic growth. He, therefore, recommended that the defence budget should be below two per cent of GDP,[15] which was the norm throughout the1950s and the early 1960s—before India went to war with China in 1962 (see Figure 2.1).

Figure 2.1: % Share of Defence Budget in GDP, 1950/51-2013/14



Source: Figure extrapolated by the author from data as provided in Ministry of Defence, Government of India, *Defence Services Estimates* (relevant years); Ministry of Finance, Government of India, *Economic Survey 2012-13*; and Ministry of Finance, Government of India, *Union Budget 2013-14*.

Despite the self-sufficiency model being designed around low-end technology and minimal dependency on state funding, India's defence production up to mid-1960s was quite remarkable, although there were certain weaknesses. The production of ordnance factories in the 1950s had 'eased dependence on foreign (primarily British) sources, which

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15 Stephen P. Cohen and Sunil Dasgupta, *Arming without Aiming: India's Military Modernisation* (Penguin: New Delhi, 2010), p. 6.

accounted for no less than 90 per cent of India's military equipment and stores in 1950'. By 1953, 80 per cent of the Army's light equipment was produced indigenously, and India was self-sufficient in non-lethal stores and equipment.[16] During this period, the government also undertook initiatives for the production of tanks, trucks, tractors, and jeeps in OFs, for which technical assistance was sought from foreign countries.

In aeronautics, there was a more ambitious pursuit of self-sufficiency at HAL, which was brought under the control of MoD in 1951. During the 1950s, HAL made significant strides in assembling aircrafts under licence, including the Prentice, Vampire, De Havilland, and Pushpak trainers, the Douglas C-47 transport, and the Vampire fighter.[17] Along with assembly, HAL also undertook the design and development of trainers and fighters, including the HT-2 primary trainer and HF-24 *Marut* fighter. The HT-2 project was first authorised by the government in September 1948, and the first prototype flew in less than three years later, in August 1951. A total of 161 aircraft were produced by 1962, when the production line was closed for lack of orders.[18]

The HF-24 *Marut* was an ambitious project conceived by Prime Minister Nehru and Defence Minister Krishna Menon for achieving self-sufficiency in aeronautics.[19] The design and development of the *Marut* began in 1956 under the guidance of the famous German designer Kurt Tank, who worked along with German and Indian teams (the latter led by V.M. Ghatage). As per initial plans, the *Marut* was envisaged in two versions: the transonic Mark 1 version with the Orpheus 703 turbojet engine; and the supersonic Mk 2 with the single Orpheus 12 turbojet engine. Within four years the HF-24 *Marut* took to the sky in

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16 Lorne J. Kavic, *India's Quest for Security: Defence Policies, 1947-1965* (University of California Press: Berkeley, 1967), p. 129.

17 Thomas W. Graham, 'India', in James Everett Katz, ed., *Arms Production in Developing Countries: An Analysis of Decision Making* (D.C. Heath and Company: Lexington, 1984), p. 163.

18 Lorne J. Kavic, *India's Quest for Security: Defence Policies, 1947-1965*, note 16, p. 132.

19 Chris Smith, *India's Ad Hoc Arsenal: Direction or Drift in Defence Policy?* (Oxford University Press: Oxford, 1994), p. 160.

June 1961, powered by two Orpheus 703 engines.[20] However, the engine of the *Marut* was underpowered, and later efforts to integrate the plane with a more powerful engine did not succeed. The engine proved to be *Marut's* 'Achilles heel', which left the Indian Air Force with a sub-sonic jet, and led to a lowering of production from the projected 214 units to 164 units.[21]

Compared to scale of indigenous production for the army and the air force, the navy in the early phase of industrialisation was accorded low priority, partly because of the land- and air-centric threat perceptions from Pakistan and China, and also because of the benign British naval presence in the Indian Ocean. It was only in 1955 that a small order was placed on a domestic shipyard to construct a survey vessel.[22]

Despite some notable successes achieved by the defence industry, the self-sufficiency model in the early years of independence had certain weaknesses. These can partly be ascribed to the low defence allocation, and the under-developed state of R&D and the industrial base at the time. Defence allocation, which is a critical component of the indigenous efforts in terms of building basic infrastructure, was inadequate in the 1950s and the early 1960s. Between 1950-51 and 1960-61, the share of defence expenditure in total central government expenditure was reduced by more than half—from 33 per cent to less than 16 per cent.

The necessity for India to undertake R&D in advanced systems had found no mention in the Blackett report. Not surprisingly therefore, R&D was accorded a low priority, with the DRDO accounting for about one per cent of the defence budget in the 1960s.[23] This, coupled with the lack of a civil industrial base, had a major impact on the indigenous content and the production schedule. The production programmes initiated with foreign assistance—such as Komatsu tractors,

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20 Lorne J. Kavic, *India's Quest for Security: Defence Policies, 1947-1965*, note 16, p. 133.

21 Thomas W. Graham, *'India'*, note 17, p. 170.

22 Lorne J. Kavic, *India's Quest for Security: Defence Policies, 1947-1965*, note 16, p. 135.

23 Standing Committee on Defence 1995-96, 10th Lok Sabha, *Defence Research and Development: Major Projects*, 5th Report (Lok Sabha Secretariat: New Delhi, 1995), p. 4.

Shaktiman and Nissan trucks, and Nissan Patrol jeeps—were 'behind schedule and heavily dependent upon foreign components.'[24] Despite their production in India, their indigenous content was quite low. The aircraft industry, which took some bold initiatives, fared even worse. Despite its success in designing few aircrafts, HAL was dependent on foreign sources not only for special steel and aluminium but also for all instrumentation, undercarriage, braking, communication and electronic systems.[25]

Self-Sufficiency to Self-Reliance

The events of the 1960s—particularly the 1962 war with China and the India-Pakistan war of 1965—brought about a major change in India's defence policy. Not only was India's defence budget - as a percentage of GDP - increased in the subsequent years (Figure 2.1) but the approach towards arms procurement and indigenous defence production also changed. Post-1962, India sought and received military assistance from a host of countries, including the US. However, the US embargo after the India-Pakistan war of 1965 prompted India to forge close defence links with the Soviet Union. On its part, and given Cold War politics, the Soviet Union was more than willing to provide arms and assistance to India at terms that were favourable to New Delhi.[26] A major beginning of this close cooperation was made with the MiG-21 aircraft deal which was signed in October 1962, and which led to its licenced manufacturing by HAL.[27] The Soviet Union thus became the main arms supplier to India and, by 1980, roughly 70 per cent of Indian military hardware was of Soviet origin.[28]

The 1962 war with China also led to a significant expansion of India's defence industrial base. Post-1962 and, by the mid-1980s, 11 new

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[24] Lorne Kavic, *India's Quest for Security: Defence Policies, 1947-1965*, note 16, p. 136.

[25] Ibid, p. 137.

[26] Amit Gupta, 'The Indian Arms Industry: A Lumbering Giant?', *Asian Survey*, Vol. 30, No. 9, September 1990, p. 855.

[27] Ian Anthony, *The Arms Trade and Medium Powers: Case Studies of India and Pakistan 1947-90* (Harvester Wheatsheaf: New York, 1992), p. 58.

[28] Ravinder Pal Singh, 'Indo-Soviet Military Cooperation: Expectation, Trends and Opportunities', *Strategic Analysis*, December 1990, p. 1081.

ordnance factories were established, including the Ordnance Cable Factory in Chandigarh (1963), and the Vehicle Factory in Jabalpur (1969).[29] Two new DPSUs: MIDHNI and BEML, to produce special steel and alloys, and military vehicles, respectively were also established. In addition, decisions were taken to expand the DRDO laboratories to include research in aeronautics, electronics, naval technology, materials, life science, and engineering equipment.[30]

Unlike the first stage of India's defence industrialisation, the focus in the second stage was more on licenced production rather than on production based on indigenous design and developmental efforts. Apart from the MIG-21, a number of other projects were undertaken for the licenced production of tanks, destroyers, etc.

As in the first phase of defence industrialisation, the second phase also had some flaws. However, the weaknesses in the second stage are unique in several ways. While the first stage was hampered by the lack of R&D and industrial support leading to import dependency; the second stage saw the formalisation of dependency with the forging of a close relationship with the Soviet Union for licenced manufacturing in India. The painstaking efforts made for indigenous production—particularly in aeronautics—paved the way for pure licence-based production. This continues to be a feature of India's aeronautics industry till today. While the Soviet arms and technology transfers helped India to strengthen its military capability, they did little to strengthen its defence industrial and technological capability. As a former DRDO chief noted: 'Most defence production in India was under licence, which neither led to capacities to design nor develop advanced manufacturing techniques; licences for assembly of weapon systems simply followed one another in boring succession.'[31]

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29 Ordnance Factory Board, *Annual Report 2006-07*, p. 12.

30 Amit Gupta, *Building an Arsenal: The Evolution of Regional Power Force Structures* (Praeger: Westport, 1997), p. 42.

31 Ravinder Pal Singh, 'India, in Ravinder Pal Singh, *Arms Procurement Decision Making: China, India, Israel, Japan, South Korea and Thailand* (Oxford University Press and SIPRI: Oxford, 1998), p. 65.

This dependence on the Soviet Union for direct arms transfers and licenced manufacturing however led to an unhealthy situation. By the end of the Cold War, India was 100 per cent dependent on the Soviet Union for ground air defence; 75 per cent for fighter aircraft; 60 per cent for ground attack aircraft; 100 per cent for tracked armoured vehicles; 80 per cent for tanks; 100 per cent for guided missile destroyers; 95 per cent for conventional submarines; and 70 per cent for frigates.[32]

From Self-Reliance to Co-production

The awareness of the pitfalls of overdependence on the Soviet Union, brought about a change in India's approach to defence industrialisation from licence based production to production based on indigenous design. From the mid-1980s, the government pumped resources into R&D to enable the DRDO to undertake high-profile projects. An important beginning in this respect was made in 1983, when the government sanctioned the Integrated Guided Missile Development Programme (IGMDP) at an initial cost of Rs 388.83 crore to develop four missile systems: *Prithvi* (surface-to-surface); *Akash* (surface-to-air); *Trishul* (the naval version of *Prithvi*); and *Nag* (anti-tank); as well as a technology demonstrator, *Agni*.[33] In the same year also the government sanctioned the Light Combat Aircraft (LCA) project to develop a combat aircraft at the initial cost of Rs 560 crore.[34]

However, the indigenous efforts were not adequate to meet the requirements of the armed forces. This forced the government to seek military hardware from external sources. However, unlike in the previous phases, the focus shifted towards co-development and co-production in partnership with foreign companies. A beginning was made in 1998, when India and Russia signed an inter-governmental agreement to jointly produce *BrahMos* supersonic cruise missile. A JV

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[32] Damon Bristow, *India's New Armament Strategy: A Return to Self-Sufficiency?* Royal United Services Institute, Whitehall Paper 31, 1995, p. 30.

[33] Standing Committee on Defence 2006-07, 14th Lok Sabha, *Defence Research and Development Organisation (DRDO)*, 14th Report (Lok Sabha Secretariat: New Delhi, 2007), p. 88.

[34] Standing Committee on Defence 1995-96, 10th Lok Sabha, *Defence Research and Development: Major Projects*, 5th Report (Lok Sabha Secretariat: New Delhi 1995), p. 17.

was set up in India with an authorised capital of $250 million, in which India had a 50.5 per cent share and Russia the rest—the equity structure is designed to enable the JV to operate like a private entity for 'fast' decision-making.[35] Since the *BrahMos,* a number of collaborative programmes have been taken up by India, for combat and transport aircraft, and a range of missile systems.

Taking the *BrahMos* model further, in 2007 India and Russia signed two inter-governmental agreements for the co-development and co-production of two major aircraft projects: Multi Role Transport Aircraft (MTA), and the Fifth Generation Fighter Aircraft (FGFA). As per the agreements, India has a 50 per cent investment share in both projects.[36] Pursuant to the 2007 agreement, in 2010 the designated Indian partner HAL signed the Preliminary Design (PD) contract for the FGFA with its Russian partners. The PD of FGFA, valued at $295 million, is planned to be completed within 18 months, after which the full scale design work will be taken up. India plans to acquire as many as 250 FGFAs from 2018 onwards.[37] For the MTA, a JV was formed in 2010, with an initial outlay of $600.7 million (at the 2006 price), to be funded equally by both sides.[38]

Apart from Russia, India has also partnered with other counties such as Israel and France for a number of projects. Cementing the growing defence trade between Tel Aviv and New Delhi, India's DRDO and Israel Aerospace Industries (IAI) are currently undertaking two missile systems: the Long Range Surface to Air Missile (LR-SAM), and the Medium Range Surface to Air Missile (MR-SAM).[39] With France, India

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35 Standing Committee on Defence (2006-07), 14th Lok Sabha, *Defence Research and Development Organisation (DRDO)*, note 32, p. 63

36 'Joint Manufacturing of Aircraft', Press Information Bureau, Government of India, March 15, 2010.

37 'Fifth Generation Fighter Aircraft', Press Information Bureau, Government of India, May 07, 2012; 'Joint Development of Fifth Generation Fighter Aircrafts with Russia', Press Information Bureau, Government of India, August 03, 2011.

38 'Agreement with Russia for Multi-role Transport Aircraft', Press Information Bureau, Government of India, November 10, 2010.

39 Ministry of Defence, Government of India, *Annual Report 2010-11*, p. 97.

has concluded a six billion dollar deal for co-development and co-production of Short Range Surface to Air Missile (SR-SAM).[40]

Self-Reliance through Private Sector Participation

Along with co-production, the government has lately been making concerted efforts to liberalise the defence industry and allow greater participation of the Indian private sector, which has historically been denied a direct role in defence production.[41] The lack of the direct involvement of the private sector in defence production has been acutely felt as existing public sector enterprises have failed to meet the requirements of the armed forces within the prescribed time, forcing the government to take the import route. However, the liberalisation process has been long drawn-out, dating back to the constitution of six task forces in 1998 for examining the possibility of private enterprises complementing the efforts of the public defence enterprises.[42] Consequent to the recommendation of the task forces, the government finally opened up the defence industry to the private sector in 2001, with the further provision of permitting foreign direct investment of up to 26 per cent.

However, the opening up of the defence industry did not translate into easy access to defence contracts as the MoD's Defence Procurement Procedure (DPP)—that lays down detailed procedures for capital procurement, the modes of procurement with respect to indigenous or foreign sources, or a combination of both—did not have adequate provisions to facilitate the participation of private companies in defence contracts. To ensure this participation, successive DPPs have made some efforts, including a comprehensive offset guidelines; two new procurement categories, 'Make' and 'Buy and Make (Indian)'; and a set of guidelines to identity Raksha Udyog Ratnas (RURs) or Champions from among the private companies.

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40 "India, France conclude $6 bn deal on Surface to Air Missile", *The Economic Times*, February 14, 2013

41 Laxman Kumar Behera, 'Enhancing Private Sector Participation in India's Defence Production', *Defence and Security Analysis*, Vol. 27, No. 3, pp. 251–265, September 2011.

42 The Boston Consulting Group and Confederation of Indian Industry, *Creating a Vibrant Defence Manufacturing Sector*, March 2012, p. 21.

Under the offset guidelines, foreign companies winning MoD contracts valued at Rs 300 crore or more are required to plough back 30 per cent of the foreign exchange component of the contract into Indian industry. For the private sector, the government has kept the field open by giving foreign companies the freedom to choose their Indian partners, irrespective of their being in the public or private sector. The government is hopeful that offsets, estimated at $30 billion in the coming 5-10 years,[43] will be prove to be a catalyst for developing India's private sector and meeting the government's self-reliance target.

The 'Make' category is a revolutionary step, designed to provide the Indian industry, including large private enterprises, the opportunity to indigenously design, develop and produce 'high technology complex systems'. The category was included for the first time in the DPP-2006 following the acceptance of the 2005 report of the Kelkar Committee which recommended a host of policy measures to enhance self-reliance in defence production. Under the 'Make' procedure, the government is committed to providing 80 per cent of the developmental costs to the industry. So far, two big army projects—Tactical Communication System (TCS) and Future Infantry Combat System (FICV)—have been identified under this category, with the former (estimated to be worth Rs 10,000 crore) being finalised for simultaneous development by two groups, including a private Special Purpose Vehicle (SPV), consisting of L&T, Tata Power SED and HCL Infosystems Ltd.[44] As many as 150-180 projects are believed to be in the pipeline in this category.[45]

Complementing the 'Make' category is the 'Buy and Make (Indian)' category. Under this, MoD contracts are to be given to Indian industry, including capable private companies, which may form joint ventures with foreign companies to deliver the final product. This is a marked departure from the existing 'Buy and Make' category, which has

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43 Standing Committee on Defence, 15th Lok Sabha, *Demands for Grants (2011-12)*, 12th Report (Lok Sabha Secretariat: New Delhi, 2011), p. 14.

44 'FICCI hails shortlisting for India's first 'MAKE' Programme-Tactical Communication Systems', Federation of Indian Chambers of Commerce and Industry, Press Release, June 21, 2012.

45 Ajai Shukla, 'Defence Min signals growing acceptance of private sector', *Business Standard*, March 30, 2012.

historically been used by the MoD to nominate its own enterprises (DPSUs/OFs) for undertaking licenced production (based on technologies supplied by foreign companies), thus excluding the private sector. The 'Buy and Make (Indian)' category is expected to eliminate this discrimination, and put the private sector on an equal footing. The Indian armed forces seem to be in favour of new category, with the IAF initially showing a clear interest in it for its $3.0 billion 'Avro replacement programme' under which 56 new transport aircraft will be acquired.[46]

2.2 Estimating Self-Reliance: Methodology and Limitation of Data

As mentioned above, as early as 1992, the Kalam Committee had defined self-reliance in the form of an index, reflecting the share of the indigenous contribution in total procurement expenditure. By this definition, the higher the index the greater the share of procurement from indigenous sources, and thus higher is self-reliance. However, this definition suffers from one weakness: it does not distinguish between what is critical for indigenous production (because of the denial regime and the fear of sanctions at the time of need) and what can be procured off-the-shelf without the fear of supply-chain disruptions. In the post-Cold War period in which arms production has become increasingly globalised, and in view of the increasing trend of the 'spin-in' effects of civilian technology on the military industry, it may not be economically viable to produce everything in-house. Despite this weakness, the Kalam committee definition remains the only methodology available for estimating the self-reliance index. This is so primarily because of the difficulty of putting together a lot of information about what is critical and what is not, and updating it regularly with technological developments.

The estimation of self-reliance by using the Kalam committee definition is not straightforward. This is because there is a lack of consistent data in the public domain. For the estimation of SRI what is required is two

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[46] 'IAF Wants Indian Private Sector to Manufacture Aircraft', *The Times of India*, September 2, 2011.

sets of data: first, information about India's total procurement, which includes both revenue procurement and capital procurement,[47] and second, information about imports, both direct and indirect. While direct imports consist of orders directly placed by the MoD on foreign suppliers, indirect imports comprise of the goods and services that the Indian defence industry obtains from foreign companies for production purposes. Thus, domestic supplies minus indirect imports would indicate self-reliance.

The existing *Defence Services Estimates* (DSE), which is a public document presented to the Parliament at the beginning each financial year, provides various sets of data. The data is broadly given under two categories—Revenue Expenditure and Capital Expenditure—for the armred forces, OFs, and the DRDO. Revenue Expenditure includes pay and allowances, transportation, revenue stores (like ordnance stores, rations, petrol, oil and lubricants, spares, etc.), revenue works (such as the maintenance of buildings, water and electricity charges, rents, etc.), and other miscellaneous expenditure. Capital Expenditure includes expenses on land, construction works, aircraft and aero engines, heavy and medium vehicles, other equipment, rolling stock, joint staff, naval fleet, naval dockyards, plants, machinery, and equipment. What distinguishes Revenue Expenditure from Capital Expenditure is the unit price of an item, and its service life. Normally, expenditure on an item which has the unit price of Rs. 10,000,00 or more, and has a life span of seven years or more, is debited to Capital Expenditure.

It is important to mention that Revenue Procurement and Capital Procurement are not formal classifications in the DSE although they are widely used in various official documents. They stand for the expenditure incurred by the three armed forces on procurement of various items that are both revenue and capital in nature. In other words, the cost of procurement by other defence services—such as the DRDO and OFs—are not included under these two heads. While Revenue

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[47] The Defence Services Estimates is broadly divided into two categories: Revenue Expenditure and Capital Expenditure. The Revenue Expenditure caters mostly to the pay and allowance of the armed forces, and the revenue stores. The Stores budget is generally considered the revenue procurement. The Capital Expenditure is primarily used for capital acquisition which is also known as capital procurement.

Procurement is generally known as the armed forces' expenses on 'stores', Capital Procurement—which is also known as capital acquisition or modernisation expenditure—includes a number of items including aircraft and aero engines, heavy and medium vehicles, other equipment, rolling stock, joint staff, naval fleet, and naval dockyard. Capital Procurement expenditure is much higher than that of Revenue Procurement, accounting for about 60-70 per cent of total procurement expenditure between 2006-07 and 2010-11.

It is also important to mention that although DSE is useful for obtaining data on Revenue Procurement and Capital Procurement, the document does not provide any details as to the sources of the supplies, except in the case of a few items of expenditure. In other words, the DSE is not a comprehensive source for obtaining data on expenditure on account of domestic supplies and import.

Compared to the DSE, the *Defence Services Estimates* Vol. II (DSE Vol. II) - a document which the Finance Division of the MoD has been preparing since 2002-03[48] - is contains some information on procurement from domestic and foreign sources. However, this document is meant for 'internal' purposes only and its public use is restricted.

The above limitations restrict the estimation of SRI to the sporadic data provided by the MoD, and some inconsistent data provided by the DPSUs and OFs. From time to time, the MoD provides data to the Parliament and the Standing Committee on Defence (SCD) on procurement from domestic and foreign sources. For example, submitting before the SCD of 2005-06, the MoD submitted a 10-year time series data on procurement (both Revenue and Capital), and its percentage sub-division into domestic supplies and imports (Table 2.1). However, availability of such time series data is limited and infrequent. In recent times, the MoD has started providing data only on Capital Procurement (Table 2.2). This has thus limited the present study to the estimation of self-reliance in Capital Procurement only.

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[48] Since 2002-03, the Finance Division of the MoD is publishing DSE Vol. II, which provides more detailed information, including certain sources of procurement.

Table 2.1: Procurement (Revenue and Capital) from Indigenous and Foreign Sources

Year	Total Procurement (Revenue & Capital) Rs. in Cr	Domestic Sources (%)	Import (%)
1994-95	12610	31.21	68.79
1995-96	14857	30.50	69.50
1996-97	15953	30.68	69.32
1997-98	18006	44.04	55.96
1998-99	20882	53.66	46.34
1999-00	26674	54.00	46.00
2000-01	27440	53.28	46.72
2001-02	31353	58.03	41.97
2002-03	31089	53.73	46.27
2003-04	34021	58.63	41.37

Source: Standing Committee on Defence (2005-06), 14th Lok Sabha, *Procurement Policy and Procedure*, 6th Report (Lok Sabha Secretariat: New Delhi, 2005), p. 3.

Table 2.2: Capital Procurement from Domestic and Foreign Sources

	2000-01	2006-07	2007-08	2008-09	2009-10	2010-11
Total Procurement (Rs. in Cr)	10501.91	26900.44	27903.42	30000.42	39332.39	46887.56
Domestic Sources (Rs. in Cr)	4680.68	21359.16	17741.57	19797.30	25920.48	31444.55
Direct Import (Rs. in Cr)	5821.23	5541.28	10161.85	10203.12	13411.91	15443.01
Domestic (%)	44.57	79.40	63.58	65.99	65.90	67.06
Direct Import (%)	55.43	20.60	36.42	34.01	34.10	32.94

Source: Standing Committee on Defence (2006-07), 14th Lok Sabha, *Demands for Grants (2007-08)*, 16th Report (Lok Sabha Secretariat: New

Delhi, 2007), p. 20; Standing Committee on Defence (2009-10), 15th Lok Sabha, *Demands for Grants (2009-10)*, 1st Report (Lok Sabha Secretariat: New Delhi, 2009), p. 22; 'Expenditure on Defence Purchases', Press Information Bureau, Government of India, May 21, 2012.

As shown in the Tables 2.1 and 2.2 above, there has been an increase in the share of domestic procurement in total procurement, with the difference that whereas the former is inclusive of Revenue and Capital procurement, the latter includes only Capital Procurement. The increasing share of domestic procurement does not, however, mean an increase in self-reliance. This is because a significant portion of the procurement from domestic sources consists of, what can be termed as 'indirect defence imports' which is nothing but imports by the Indian defence industry—primarily by the DPSUs and OFs—for production and supplies for the armed forces. The indirect imports consist of raw materials, components and spare parts, capital goods and special tools. It also includes the amount spent in foreign currency in the form of royalty, licence and documentation fee, and foreign consultancy. It is to be noted that unlike the direct imports for which some consistent data is available, there is no comprehensive data on the quantum of indirect imports in the final supplies made by the domestic industry. However, this limitation can be partly overcome by estimating the import dependency of domestic arms production and assuming that the same dependency is reflected in the procurement from domestic sources. Based on this methodology, the import dependency can be further used to deflate domestic supplies to arrive at the indirect import and indigenous content.

The estimation of import dependency of the Indian defence industry again suffers from either the lack, or inconsistency, of data. Whatever data is available is restricted to the DPSUs and OFs (the existing budgetary practices do not allow for capture of supplies from the Indian private sector).[49] The data from DPSUs and OFs is also inconsistent in that, while enterprises like HAL disclose the annual value of imported goods (raw materials, parts, components, etc.) and services

[49] 'Expenditure on Defence Purchases', Press Information Bureau, Government of India, May 21, 2012.

that go into final production, companies like BEL share only an aggregate value of their annual foreign exchange outgo. Although the currency outgo is primarily meant for importing production inputs, it does not necessarily establish a link with annual production.

However, this inconsistency can be overcome to a large extent by calculating a series of the annual outflows of foreign currency, and linking them with the annual production figures to observe the trend of import dependency. Using this methodology, the import dependency of DPSUs and OFs can be estimated with respect to their annual value of production, as shown in Tables 2.5 to 2.13 at the end of this chapter. The combined import dependency of all state-owned defence enterprises (excluding HSL) is shown in Table 2.3.

Table 2.3: Import Dependency of DPSUs and OFs

Year	Value of Production (Rs. in Cr)	Import Content (Rs. in Cr)	Import Dependency of Production (%)
2006-07	25408.1	10071.36	39.64
2007-08	26728.9	9257.735	34.64
2008-09	32972.8	14766.51	44.78
2009-10	70598.3	15743.34	42.62
2010-11	43360.4	18457.18	42.57

Notes:

1. VoP is exclusive of HSL's which became a DPSU in February 2010.

2. The VoP of OFs is net production based on the assumption that nearly 25 per of Ordnance Factories' gross production is IFD.

2.3 Self-Reliance Index, 2006-07 to 2010-11

Based on the methodology discussed above, the self-reliance index is given in Table 2.4 (see explanation under the table). The index shows that although self-reliance has increased from the levels of the 1990s, there has been a decline in the past five years, and stood at 38.5 per cent in 2010-11. Among others, the table also shows sizeable indirect

imports by the domestic industry for armament production. Indirect imports, together with the direct arms imports, varied between 52 and 61 per cent in the five year period.

Table 2.4: Self-Reliance Index for 2006/07-2010/11

1				2006-07	2007-08	2008-09	2009-10	2010-11
2	Domestic Capital Supplies of which	2(a)	Indigenous Content (Rs. in Cr)	12892.74	11596.66	10931.30	14873.22	18059.57
		2(b)	Indirect Import (Rs. in Cr)	8466.42	6144.91	8866.00	11047.26	13384.98
3	Direct Capital Import (Rs. in Cr)			5541.28	10161.85	10203.12	13411.91	15443.01
4	Total Capital Procurement (Rs. in Cr)			26900.44	27903.42	30000.42	39332.39	46887.56
5	Indigenous (%) (Self-Reliance Index)			47.93	41.56	36.44	37.81	38.52
6	Indirect Capital Import (%)			31.47	22.02	29.55	28.09	28.55
7	Direct Capital Import (%)			20.60	36.42	34.01	34.10	32.94

Explanation of Estimation

The import dependency of the Indian defence industry, shown in Table 2.3, has been used to determine the indirect import and indigenous content in domestic supplies. The derived data is given in Row 2 of Table 2.4. The data in Row 2 (a) represents what may be called the indigenous content of domestic supplies, whereas the data in 2(b) shows indirect imports (that is, the import content in domestic supplies). An example of how the indigenous and import content of domestic supplies is calculated for 2006-06 is given below. The same principle applies for other years.

In 2006-07, the value of domestic supplies was Rs 21359.16 crore (see Table 2.2). In the same year, the import dependency of the domestic industry's armament production amounted to 39.64 per cent (Table

2.3). Assuming that the same import dependency is reflected in domestic procurement, the value of import content in domestic procurement amounts to Rs. 8466.4 crore—or 39.64 per cent of Rs. 21359.16 crore—(Row 2(b) of Table 2.4). The balance, Rs 12892.74 crore (which is 60.36 per cent of Rs 21359.16 crore) represents the indigenous content in domestic supplies (Row 2(a) in Table 2.4). The indigenous content as a percentage of total procurement indicates the self-reliance index.

Table 2.5: HAL's Import Dependency

Year	Value of Production (Rs. in Cr)	Value of Consumption of Imported Inputs and Expenditure in Foreign Currency (Rs in Crores)	Import Dependency of Production (%)
2006-07	9201.88	6169.02	67.04
2007-08	8791.52	4642.90	52.81
2008-09	11810.85	7364.03	62.35
2009-10	13489.59	9020.80	66.87
2010-11	16450.84	11457.98	69.65

Note: Inputs include raw materials, spare parts, and components consumed in a given year. Expenditure in foreign currency incurred on account of royalty, licence fees, documentation, professional, consultancy, and foreign technical fees, etc.

Table 2.6: BEL's Import Dependency

Year	Value of Production (Rs in Cr)	Foreign Exchange Outgo (Rs in Cr)	Import Dependency of Production (%)
2006-07	4012.75	1460.98	36.41
2007-08	4111.37	1503.41	36.57
2008-09	5273.27	2437.90	46.23
2009-10	5247.88	2145.74	40.89
2010-11	5520.80	1875.09	33.96

Table 2.7: BEML's Import Dependency

BEML	Value of Production (Rs in Cr)	Foreign Exchange Outgo (Rs in Cr)	Import Dependency of Production (%)
2006-07	2590.75	808.47	31.21
2007-08	2826.95	645.58	22.84
2008-09	3294.19	772.89	23.46
2009-10	3739.92	670.19	17.92
2010-11	3795.07	652.67	17.20

Table 2.8: MDL's Import Dependency

MDL	Value of Production (Rs in Cr)	Value of Consumption of Imported Inputs and Expenditure in Foreign Currency (Rs in Cr)	Import Dependency of Production (%)
2006-07	1872.24	895.75	47.84
2007-08	2321.69	1178.23	50.75
2008-09	2568.93	1899.04	73.92
2009-10	2856.13	984.21	34.46
2010-11	2611.41	986.70	37.78

Note: Inputs include raw materials, stores, equipment and spares etc consumed in a given year. Expenditure in foreign currency incurred on account of royalty, technical know-how, consultation fees and other matters.

Table 2.9: Import Dependency of GRSE

GRSE	Value of Production (Rs in Cr)	Value of Consumption of Imported Inputs and Expenditure in Foreign Currency (Rs in Cr)	Import Dependency of Production (%)
2006-07	641.66	65.25	10.17
2007-08	573.47	56.67	9.88
2008-09	672.69	105.69	15.71
2009-10	870.74	169.08	19.42
2010-11	1053.30	98.48	9.35

Note: Inputs include raw materials and components consumed in a given year. Expenditure in foreign currency incurred on account of know-how, consultation/service fees, and exclusive of interest on foreign supplies credit, deferred payment to foreign suppliers, and other payments (for equipment/material, etc.).

Table 2.10: Import Dependency of GSL

GSL	Value of Production (Rs in Cr)	Value of Consumption of Imported Inputs and Expenditure in Foreign Currency (Rs in Cr)	Import Dependency of Production (%)
2006-07	267.07	81.13	30.38
2007-08	317.21	133.14	41.97
2008-09	508.01	156.44	30.79
2009-10	866.48	302.37	34.90
2010-11	990.32	219.13	22.13

Note: Inputs include raw materials and stores consumed in a given year. Expenditure in foreign currency incurred on account of know-how, professional consultancy fees, inspection charges, interest, and other matters.

Table 2.11: Import Dependency of BDL

BDL	Value of Production (Rs in Cr)	Foreign Exchange Outgo (Rs. in Cr)	Import Dependency of Production (%)
2006-07	385.84	86.88	22.52
2007-08	505.85	287.74	56.88
2008-09	523.06	346.03	66.15
2009-10	631.61	261.52	41.41
2010-11	910.98	263.19	28.89

Table 2.12: Import Dependency of MIDHANI

GSL	Value of Production (Rs in Cr)	Value of Import Content (Rs in Cr)	Import Dependency of Production (%)
2006-07	223.88	67.17	30.00
2007-08	296.40	88.92	30.00
2008-09	364.03	109.21	30.00
2009-10	373.24	103.01	27.60
2010-11	485.46	145.64	30.00

Table 2.13: Import Dependency of OFs

OFB	Value of Production (Rs in Cr)	Import (Rs in Cr)	Import Dependency of Production (%)
2006-07	8282.72	436.71	5.27
2007-08	9312.62	721.15	7.74
2008-09	10610.40	1575.29	14.85
2009-10	11817.89	2086.42	17.65
2010-11	9038.78	2758.30	30.52

Chapter III

SELF-RELIANCE
REVIEW OF POLICY RECOMMENDATIONS

Post the Kargil conflict, India has set up at least eight committees/ taskforces to look into the various aspects of national defence, including indigenous defence production and self-reliance. However, as is the fate of many government appointed committees on national security, the recommendations made by expert groups are hardly ever implemented in time, or in their totality. What is worse is that, on several occasions, the reports of these groups are not put in the public domain, thus preventing wider public debate on this crucial aspect of national security. This chapter attempts to examine the policy recommendations of various committees on issues of defence production and self-reliance based on interactions with some members of the committees, and/or information available in the public domain. The review is, however, restricted to the first five committees as mentioned in the table below.

Table 3.1: Select Committees on National Security post 1999

Report	Chairman	Year of Submission	Status of Report
Reforming the National Security System*		2001	declassified
1. Towards Strengthening Self Reliance in Defence Preparedness; 2. Revitalising Defence Public Sector Undertakings and Ordnance Factories	Vijay L Kelkar	2005	Partly declassified
Improving Defence Acquisition Structures in MoD	N S Sisodia	2007	Yet to be declassified

cont ...

Redefining DRDO	P Rama Rao	2008	Yet to be declassified
Defence Expenditure Review	V K Misra	2009	Yet to be declassified
National Security	Naresh Chandra	2012	Yet to be declassified
Defence Modernisation and Self-Reliance	Ravinder Gupta	2012	Yet to be declassified
Restructuring of Hindustan Aeronautics Ltd (HAL)	B K Chaturvedi	2012	Yet to be declassified

* Reforming the National Security System is the report prepared by the Group of Ministers (GOM) consisting of four cabinet ministers: home affairs, defence, external affairs, and finance.

3.1 Group of Ministers

Following the submission of the Kargil Review Committee (KRC) Report, the then prime minister set up a Group of Ministers (GoM) in 2000 to review national security in its entirety, and the KRC recommendations in particular. Four Task Forces—on intelligence apparatus, internal security, border management, and management of defence—were constituted to assist the ministerial body in finalising its report which was submitted to the government in February 2001. The Task Force on the Management of Defence, headed by Arun Singh, a former minister of state for defence, made a number of vital recommendations which were made part of the final report after being examined in several Inter-Ministerial Group meetings, and after detailed discussions with the service chiefs, the DRDO, and the department of defence production. The task force focussed on three key aspects with regard to the defence industry and self reliance: long-term planning and coordination among various stakeholders; efficiency of defence R&D; and entry of the private sector in the defence industry.

Defence Minister's Council on Production

The GoM assessment found that India's defence industry—on which huge investments have been made over the years—is hampered in the

absence of a strong planning mechanism as well as coordination among the various stakeholders. It therefore recommended the setting up of a high-level Defence Minister's Council on Production (DMCP), which would be responsible for laying down the 'broad objectives of long-term equipment policies and planning on production, [and the] simplification of procedures to facilitate the participation of domestic industry.' The council would comprise of all the stakeholders of the defence establishment, including the chief of defence staff (CDS)—a new post recommended for creation to replace the existing chief of staff committee (COSC) which was found to be ineffective in fulfilling its mandate.

Other members that the task force recommended should be part of the Council included the chiefs of the three services, the defence secretary, secretary (defence production), scientific advisor to the defence minister, the vice chief of defence staff (VCDS), and the financial advisor (Defence Services).

To ensure that the DMCP benefitted from the inputs of experts in the field of science and technology—particularly the nuclear and space domain—it was also recommended that the secretaries of the departments of space, atomic energy, and science and technology be part of the council. The membership of the council was also recommended to include eminent industrialists from the private sector so as leverage the available expertise for building a stronger national defence industry. The GoM recommended that the Directorate of Planning and Co-ordination in the department of defence production be given the additional duty of functioning as the secretariat for the Defence Minister's Council.

Private Sector Participation

The GoM was of the firm opinion that the Indian private sector, which has made considerable progress post economic liberalisation, can be harnessed for building a strong domestic industrial base. To leverage the industrial and technological capabilities of the Indian private sector, the GoM recommended that the DDP should examine the issue further in consultation with all concerned. Among others, measures to provide a level playing field to the private industry were to be examined urgently. To provide a fillip to private sector participation in

defence industry, the task force recommended the immediate rationalisation of the defence export policy. The expert group was of the strong view that a proactive export policy would not only generate employment opportunities, but would go a long way in achieving the economies of scale that would benefit the larger defence industrial cause. Such exports could also be used selectively for furthering India's relationship with target countries. The GoM also noted that the DDP, which was already engaged in an exercise to review the export policy in consultation with other concerned ministries—particularly the ministries of external affairs, finance, and commerce and private industry—should complete the exercise in six months time.

R&D

The GoM had recommended that collaborative ventures with the private sector needed to be institutionalised to make R&D and production competitive and result oriented. Specific areas in which the participation of the private sector was desirable would need to be identified and urgent time bound action taken.

Regarding the DRDO, India's premier defence R&D agency, the GoM made the following observation.

> DRDO needs to focus more on core technologies, in which expertise is neither available within the country nor can be procured from alternative sources. At the same time, on a case to case basis, short term R&D on parts, components and sub-assemblies can be undertaken by the PAs [production agencies] and, in certain cases, also by the Services. The DRDO could provide the necessary expertise/guidance to facilitate their successful completion by the PAs and Services, on an 'as required' basis. In the due course of time, some of the PAs can be considered for designation as nodal agencies for the development and production of platforms, with the required technical support being provided by the DRDO. There is a need to rationalise DRDO laboratories, and to create a close knit interface between specific laboratories on the one hand, and production agencies/ service entities on the other. A group to be headed by Secretary DDP&S and comprising Scientific Adviser to the Raksha Mantri

and the three Service Chiefs should examine this rationalisation, and make its recommendations expeditiously to the defence minister for his consideration.[1]

3.2 The Kelkar Committee

Three years after the GoM submitted its report, the government constituted another committee under Vijay L. Kelkar, then Adviser to the finance minister. Unlike the GoM whose mandate was broad national security, the mandate of the Kelkar Committee was specific to the defence industry. The terms of references were to suggest measures to facilitate the participation of the Indian industry in the defence procurement process; harmonise the interest of the armed forces, the MoD, and the industry (both public and private) to increase defence exports; include offset provisions; and to strengthen DPSUs and OFs to assume the role of the system integrator. The committee included representatives from diverse backgrounds, including private sector companies such as the Tatas and L&T, think tanks, armed forces, and the MoD. The Committee submitted its report in two parts in 2005. Part One, entitled '*Towards Strengthening Self Reliance in Defence Preparedness'* contained 40 recommendations.

The major recommendations of Part One of the report are as follows:[2]

- Preparation of a 15-year long-term plan forming the basis of an acquisition programme
- Sharing of the long-term capital acquisition plans of the armed forces with the domestic industry
- Identification of entry points for the private sector in the acquisition process
- Identification of Raksha Udyog Ratnas (RUR)/ Champions from the private sector

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1 *Reforming the National Security System*, Recommendations of the Group of Ministers, February 2001, p. 111

2 Standing Committee on Defence (2008-09), 14th Lok Sabha, *Indigenisation of Defence Production: Public-Private Partnership*, 33rd Report (Lok Sabha Secretariat: New Delhi, 2008), p. 16.

- Policy framework to promote the participation of small and medium enterprises (SMEs) in defence production
- Setting up a dedicated and professional agency to undertake defence acquisition
- Defence R&D opportunities both for the DRDO and the industry
- Provision of offsets for procurement contracts valued at Rs 300 crore or more
- Re-examine the concept of a negative list for defence exports, and the setting up of an export marketing organisation

The Kelkar Committee carried out an 'Impact Analysis' of its recommendations. Taking 2003-04 as the base year in which the domestic share of the total procurement budget was 58 per cent, the committee was of the firm view that the reform measures proposed would lead to a progressive increase in the domestic share to 90 per cent over a period of five years. The committee identified three major economic benefits—higher manufacturing output, additional generation of employment and savings through relatively reduced procurement costs of indigenised products—that would accrue to the wider economy.

The details of the economic benefits as highlighted by the Kelkar Committee are as follows:

- Higher defence production will accelerate the growth of overall manufacturing sector by 8-14 per cent
- Increase employment by 120,000-200,000
- Savings of 30-50 per cent as result of import substitution and cheaper spares and maintenance. In absolute terms, this translates into savings of more than Rs. 4,000 crores per year

Part Two of the report, entitled '*Revitalising Defence Public Sector Undertakings and Ordnance Factories*', contained 19 recommendations. The major recommendations are as follows:

- Ordnance Factories
    - o All the ordnance factories should be corporatised under a single corporation (corporatisation does not necessarily mean privatisation)

- The corporation should be accorded Nav Ratna status
- The corporatisation could be on the lines of the Bharat Sanchar Nigam Ltd.
- The existing dispensation by the government to the OFs should continue for a period of three years to help them manage the process of change.

- Defence Public Sector Undertakings
  - HAL and BEL should be accorded Nav Ratna status
  - BEML and MDL may be accorded Mini Ratna status by relaxing eligibility criteria
  - Except MIDHANI, all other DPSUs be allowed to invest in foreign companies with the objective of obtaining hitherto non-available technology
  - DPSUs should explore the possibility of mergers and acquisitions in order to achieve economies of scale, and remain globally competitive

The Kelkar Committee report was very well received by the MoD, and several recommendations have already been implemented, or accepted for implementation (see Annexure IV for details of the Kelkar Committee's recommendations and the government's decisions). The major recommendations which have not been accepted for implementation mostly pertain to the Part II of the Kelkar Committee Report, which deals with the state-owned enterprises (DPSUs and OFs). The most crucial recommendation among these was the corporatisation of the OFs, which the committee believed essential for injecting dynamism in the organisations.

The major recommendations which have been implemented include: entry point for the private sector in the acquisition process; guidelines for shared development costs in 'Make' category projects; and the introduction of an offset clause in the arms import contract, among others. The major recommendations which have been accepted for implementation include: sharing a public version of the armed forces' capability perspective plan with the industry; guidelines for the selection of Raksha Udyog Ratna (RUR); review of the DRDO by an

independent committee; and the constitution of a committee to recommend the restructuring of the acquisition organisation. However, it must be noted that the government's acceptance of some of the Kelkar committee recommendations has not necessarily led to their implementation. For instance, acting upon the RUR recommendations, the government issued a set of guidelines for selecting RURs. A committee was also constituted (in May 2006) to identify a number of private companies which could be accorded RUR status. The recommendations of the committee, that were submitted in June 2007, are yet to be implemented, although the government had publicly stated that it would 'notify' them after review by the Defence Acquisition Council.[3]

3.3 Sisodia Committee[4]

The Kelkar Committee in its report had recommended that the government should restructure the acquisition wing of the MoD along the lines of the Direction Générale de l'armement (DGA), the French defence procurement organisation. The DGA is a highly professional and integrated body, with staff strength of about 12,000 consisting mainly of civil and military engineers, and technicians. With a procurement budget of •7.9 billion, and 80 on-going weapons programmes for 2011, the DGA is responsible for the entire cycle of project management, including the tasks of design, procurement, and the test-evaluation of systems. It is also responsible for executing export orders (estimated at •6.5 billion in 2011), on behalf of the French industry.[5]

While recommending a DGA-like structure for India, the Kelkar Committee was also of view that such a professional organisation would go a long way in creating a synergy among the various stakeholders (armed forces, the civilian bureaucracy in the MoD, R&D agencies, and industry). The committee was also of the view that such

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[3] 'Committee to identify Raksha Udyog Ratnas submits report', Press Information Bureau, Government of India, June 6, 2007

[4] This section is largely based on an interview with N.S. Sisodia, Chairman of the Committee on Improving Defence Acquisition Structures in MoD.

[5] Direction générale de l'armement (DGA), *Activity Report 2011*, p. 3

a synergy is necessary for providing an optimum 'material solution' once the capability requirements of the armed forces are finalised. From the industry point of view, the synergy among the stakeholders enables them to be participants in solutions from the time a capability gap is identified. This, in turn, gives them adequate lead time for long-range developmental and production planning, wherever feasible. In view of these immense benefits, the Kelkar Committee was confident that such an organisation would eventually be set up in India, and went to the extent of suggesting that it be termed Indian Defence Acquisition Organisation (IDAO).

Following these recommendations, the MoD set up a Committee chaired by the Director General, Institute for Defence Studies and Analyses (IDSA), N.S. Sisodia who, in his previous stint in the MoD, was in charge of public sector defence enterprises (DPSUs and OFs). Although the Sisodia Committee's report focused more on the structure and procedures of defence acquisition, it also made vital recommendations, including some innovative suggestions on enhancing the domestic defence industry's participation in the procurement process. The Sisodia Committee firmly believed that a truly integrated acquisition system was the foremost requirement for stimulating the domestic industry. Some domestic industry-centric recommendations are discussed in the following paragraphs.

Involvement of Industry in the Defence Acquisition Process

The Sisodia Committee was of the firm view that the involvement of domestic industry in the acquisition process from its earliest stage was a necessary condition for greater self-reliance. The entry point for industry should be at the finalisation stage of the long-term defence capability plan (covering a 15-year period) when it can be invited to suggest a range of options to meet a capability gap. The committee argued that prior consultation with industry will sensitise planners regarding what could be made available domestically, and what needs to be bought from outside to thwart a likely threat in the future. Informed decisions, including regarding life cycle costs, can also be taken based on a broad-based cost-benefit analysis of various options. If an indigenous solution is found feasible and cost-effective, the capability plan can accordingly be prepared to give an opportunity to domestic industry, which will lead to greater self-reliance.

In addition to involving industry players in the consultation process, the Sisodia committee also recommended that a public version of the capability plan be shared with the wider industry as also with the defence and scientific communities. The committee argued that sharing of long-tem plans with industry will enable the concerned players to plan and invest in the required infrastructure.

Involvement of Industry in Formulation of Qualitative Requirements

To give a further fillip to domestic industry in the acquisition process, the Sisodia committee made a strong pitch for industry's involvement during the preparation of Qualitative Requirements (QR),[6] which has been a matter of concern in India.[7] It has been pointed out that QRs—which constitute the starting point of India's defence procurement process—are often formulated by aggregating the best features of several weapon systems available in the global market. Consequently, the requirements are often projected beyond minimum capability requirements of the armed forces, and even beyond the industrial capability of global players. The domestic industry hardly gets a chance to participate in the process of the acquisition of weapons with such ambitious QRs, even though they have the capability to meet the minimum requirements.

The committee argued that efficiency in QR formulation would not only lead to faster and better procurement but would also promote greater self-reliance by projecting the realistic requirements, in keeping with the potential of the domestic industry. As in the capability plan, the industry could be invited to make suggestions based on domestic industrial capabilities to meet the minimum inescapable requirements of the armed forces. Informed decisions can thus be taken, based on the interaction with domestic industry, in order to give it a chance.

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[6] QRs are a set of technical/operational specifications that a weapons system is required to have/achieve.

[7] For a detailed overview of the QR-related problems, see Laxman Kumar Behera, 'India's Defence Acquisition System: Need for Further Reforms', *The Korean Journal of Defense Analysis*; and Comptroller and Auditor General of India, 'Defence Services, Army and Ordnance Factories', Performance Audit Report No. 4 of 2007, pp. 10-12.

Re-designation of Department of Defence Production

The acquisition committee headed by Sisodia felt that the existing Allocation of Business Rules of the Department of Defence Production (DDP) were not consistent with its responsibilities which have been expanded with the entry of private sector since 2001. The committee argued that since the private sector has an important role to play in defence production, its interests should also be protected by the DDP which is often found to favour state-owned enterprises over the private sector. To create a level-playing field, the committee recommended that the DDP should be re-designated as the department of defence industry. The re-designation should, however, be accompanied by concrete measures to reflect its expanded role. One of the measures suggested by the committee was to assign the present additional secretary in the revamped DDP, the task of looking after the interests of the private sector. At the same time, the committee also suggested that the designations of the joint secretary (JS) level officials in the DDP who are in charge of the concerned DPSUs should also be changed to reflect their wider role. For instance, JS (Shipyard), who looks after the four MoD-owned shipyards, should be redesignated as JS (Warship Production) to extend his purview to private shipyards also. Similarly, JS (HAL) could be re-designated as JS (Aircraft) Production.

Defence Industrial Policy Statement

Drawing upon the experience of advanced counties such as the UK and Australia, which periodically issue defence industrial policy statements, the Sisodia Committee had also recommended that a similar exercise be undertaken by the MoD. The committee believed that a high level policy statement would go a long way in clarifying the government's intentions of nurturing the domestic industry in view of the changing environment. The UK MoD, for instance, brought out a revised industrial strategy statement, the *Defence Industrial Strategy* (DIS), in 2005, to reflect the global security environment post Cold War, and the evolving transnational nature of the defence industry.[8] In this context, the DIS emphasises two aspects: the need to retain sovereign capability in certain key areas, and sourcing the rest from a wider global market.

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[8] UK Ministry of Defence, *Defence Industrial Strategy,* Defence White Paper, July 2005, p. 2.

Thus, the DIS offers the industry early policy clarity, which enables it to make informed decisions to meet the government's objectives.

Strategy for Defence Exports

Like the previous committees, the Sisodia Committee also emphasised the importance of exports for expanding the domestic industrial base. It has recommended that the MoD should articulate a long term export strategy in consultation with the Indian private sector to safeguard its business in view of the uncertainty in domestic demand. The committee also recommended that, as in the advanced counties, the Indian armed forces could also play a greater role in furthering defence exports. It also recommended that the government should clearly indicate to the industry the items which can be exported, and the countries to which such exports can be made. Such policy clarity would enable the industry to plan for exports.

Despite the above innovative recommendations, the Sisodia Committee report has not received the attention it deserves. Moreover, in contrast to the recommendations of other committees, which have partly been implemented or accepted for implementation, this report has been kept out of public domain.

3.4 Rama Rao Committee[9]

As a follow up to the Kelkar Committee recommendations, the government set up another committee in February 2007 under P. Rama Rao, former secretary, department of science and technology, to review and suggest measures to improve the functioning of the DRDO. The committee was mandated to review DRDO's organisational structure and to recommend necessary changes in its institutional, managerial, administrative, and financial structures to improve the functioning of this premier R&D organisation. The Rama Rao Committee (RRC) submitted its report to the government on February 7, 2008.

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[9] This section is largely based on interaction with Amiya Ghosh, former Financial Advisor, Defence Services, Ministry of Defence, Government of India, and member of the Review Committee on 'Redefining DRDO'.

After a year-long deliberations, the RRC report made many vital observations and recommendations. The committee expressed its concern, that despite notable success in its strategic programme (nuclear and missiles in particular), the role of the DRDO in defence procurement has remained as insignificant as ever. This is evident from the overwhelming share of imports as well as licence-based production by domestic industry in Indian defence acquisition. The committee was also disturbed to observe that, over the years, the DRDO's mandate—as stipulated in government's *Allocation of Business Rules of 1961*[10]—in rendering scientific advice to the concerned authorities has been diluted and has instead resulted in an import-driven procurement process, among other consequences.

Referring to the extraordinary leadership that won India its independence more than sixty years ago, the RRC also urged a similar demonstration of leadership to enable the DRDO to focus on its mandate, and attain technological independence for the country. In this regard, the committee highlighted the need for an unambiguous self-reliance policy articulated by the higher authority, and the setting of quantitative targets to achieve it. In its assessment, the RRC identified many missing links in indigenous defence R&D, including: the lack of synergy among the three key branches of the defence establishment (i.e., DRDO, industry, and users); the rigid financial, organisational and management structure of the DRDO; the thin distribution of scarce resource on non-core areas; and the incentive free manpower policy pursued by the DRDO.

The RRC made a number of recommendations to resolve the problems facing the DRDO. These include: the creation of a Defence Technology Commission (DTC) headed by the defence minister; the de-centralisation of the DRDO management; making DRDO a leaner organisation by merging some of the its laboratories with other government funded institutions with similar disciplines; the engagement of a human resources (HR) expert to rationalise the manpower of the DRDO; and the setting up of a commercial arm of the DRDO. The RRC also

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[10] The details of Allocation of Business Rules are available in the Cabinet Secretariat, Government of India, http://cabsec.nic.in/showpdf.php?type=allocation_download

recommended the creation of a Board of Research for Advanced Defence Sciences (BRADS), to function on the lines of the highly acclaimed Defence Advanced Research Projects Agency (DARPA) in the USA, which has been at the forefront of radical innovation in defence and related areas (see Annexure V for an overview of DARPA). According to the committee BRADS would stimulate advanced research by accessing and utilising the best available human resources from across the country and outside. Apart from the above, the PRC also recommended the continuation of the design and development of combat aircraft by the Aeronautical Development Agency (ADA)—an autonomous society under the DRDO; the continuation of the Kaveri aero-engine programme; the development of MBT *Arjun* Mk-II and *Akash* Mk-II by the DRDO; and the selection of industry partners by DRDO through a transparent mechanism.[11]

After the submission of the report, another in-house committee was constituted under the defence secretary to 'examine' the recommendations in terms of their acceptability. The defence secretary-headed report was approved for implementation by the defence minister on May 12, 2010. More than two years have gone by, but the major recommendations, especially those pertaining to creation of DTC, are still stuck in the bureaucratic red tape(see Annexure VI for the status of the Rama Rao Committee Report). Surprisingly, the recommendation for setting up a DARPA like-body—first mooted by the Kelkar Committee and then supported by the RRC as the BRADS—finds no mention in the defence secretary's report.

3.5 V.K. Misra Committee

The MoD set up the Defence Expenditure Review Committee (DERC), under V.K. Misra, former head of the finance division of the MoD, to recommend measures to curb wasteful expenditure in defence.[12]

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11 'MoD Announces Major DRDO Restructuring Plan', Press Information Bureau, Government of India, May 13, 2010.

12 Standing Committee on Defence (2009-10), 15th Lok Sabha, *Demands for Grants 2010"11*, 12th Report (Lok Sabha Secretariat: New Delhi, 2010), p. 18. For the composition of the DERC and its mandate, see 'Discussion with Defence Expenditure Review Committee (DERC),' Centre for Land Warfare Studies, January 16, 2009.

Although the report has not been declassified, certain details have been made public by the MoD, and the media, in particular. In a written reply to a question in Parliament in November 2010, the defence minister said that one of the mandates of the DERC was to recommend measures to achieve higher self-reliance by 'tapping the strength of the vibrant private sector.'[13] No official details of the recommendations of the DERC on the above mandate have however been made public.

According to media reports, the DERC has suggested a host of specific measures not only for strengthening the private sector but also for bringing about reforms in the broad defence industrial sector, including the DPSUs, OFs and the DRDO. Among others, the DERC has made the following recommendations:[14]

- The private sector should be encouraged to become tier-I players. The government should also take other measures to support it, including providing government support for taking over foreign defence firms.
- FDI in Indian defence industry should be increased to 49 per cent across the board, and to 74-100 per cent on a case by case basis. This is the first time that a MoD appointed committee has recommended an increase in FDI in the defence industry. Earlier, the ministries of finance and commerce had also argued for such an increase.
- A time-bound disinvestment plan to be worked out for each of the DPSUs to promote transparency, accountability, and efficiency.
- A defence advisory committee to be set up in the MoD.

In addition to the above, the DERC has also completely supported the recommendations made by the Rama Rao Committee for strengthening defence R&D, and emphasised their early implementation. The DERC also recommended the peer review of major DRDO

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[13] 'Defence Expenditure Review', Press Information Bureau, Government of India, November 15, 2010.

[14] Josy Joseph, 'Panel proposes FDI hike in defence sector to 49%', *DNA*, December 29, 2009

projects at regular interval for ensuring efficiency, accountability and transparency .

Like many other MoD-appointed committees, the report of the DERC is still in limbo, with government giving the usual excuse of examining it through 'widespread consultations with the Services and other Stakeholders.' The fact still remains that more than three years have been passed since the report was submitted, but the examination process is still not complete.

Chapter IV

SELF-RELIANCE
REVIEW OF POLICY MEASURES

In view of the moribund defence industry and the overwhelming share of imports in defence procurement, the Indian ministry of defence (MoD) has either taken or is contemplating a host of reform measures, to enhance self-reliance. A beginning was made in May 2001 when the government took the bold decision to completely open up the defence production to the private enterprises, with the further provision that they could also receive foreign direct investment (FDI) up to 26 per cent. This liberalisation process was subsequently accompanied by a host of other measures, including: domestic industry-friendly procurement procedures; guidelines for creating and nurturing a number of big private companies as system integrators of large weapon systems; and an offset policy to leverage India's huge arms imports for increasing domestic industrial capacity. In addition, the MoD also announced two major policies relating to—Joint Venture Guidelines and Defence Production Policy—to further boost India's defence production. Although these measures are quite forceful in some respects, they still fall short of the critical push required to rejuvenate the Indian defence industry. This chapter examines the policy measures taken or contemplated since 2001, and their shortcomings.

The chapter consists of seven sections. Sections 4.1 and 4.2 deal with issues of industrial licencing and FDI in the Indian defence industry, respectively. Section 4.3 critically examines the various industry-centric procurement provisions taken from time to time; Section 4.4 discusses some of the nuances in the policy relating to Raksha Udyog Ratnas (RURs). Section 4.5 critically examines the offset policy as revised in 2012. Sections 4.6 and 4.7 analyse the defence production guidelines, and guidelines for joint ventures, respectively.

4.1 Industrial Licencing

Lack of clarity on the defence industry

Although the government has allowed the Indian private sector to undertake defence production, but what constitutes a defence item has

not been defined. It is noteworthy that, unlike some other countries and international arms control organisations, that have defined defence and dual use items through comprehensive lists (e.g., the Munitions List & List of Dual-Use Goods and Technologies of the Wassenaar Arrangement), India has no lists of defence and dual-use products. This becomes an issue when the industry is required to provide the 'item code' and 'item description' while applying for an industrial licence.[1] As per current practice, the domestic industry is required to provide the 'item code' from the National Industrial Classification (NIC) Code list of 1987, which has only one code (359.4: 'manufacture of arms and armaments') for the entire range of defence manufacturing. The NIC code does not offer any clarity regarding what constitutes arms and armaments, and whether dual-use items are also covered by it. It also does not say anything about the parts and components that are used in arms and ammunition and may or may not have dual-use application, or even whether these fall under its purview.

The issues relating to 'item description' are more nuanced. There is not a single dedicated list of the 'defence' component that the industry can rely on. Rather, they have to refer to at least three different lists, depending on the list that best describes their product. Apart from the NIC list (which is the most generic among the three), the two others are the Indian Trade Classification (Harmonised System) (ITC (HS)) Code, as maintained by the Director General of Foreign Trade (DGFT) of ministry of commerce for the purpose of India's external trade; and the 'Product/Services List', as provided in the MoD's Defence Procurement Procedure (DPP), for discharge of offset obligations by foreign vendors. The DGFT list gives some broad sub-details of the items which can be covered under the defence industry. For instance, under the broad HS Code 93 (arms and ammunition; parts and accessories thereof), there are 16 sub-categories. Similarly, the MoD list provides some broad details of items in 39 groups under four broad headings: Defence Products, Products for Inland/Coastal Security, Civil Aerospace Products and Services.

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[1] The 'Composite Form for Foreign Collaboration and Industrial Licence' is available at the official website of the Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, http://dipp.nic.in/English/Investor/Forms/il-form.pdf

Although the lists of the DGFT and MoD are more elaborate compared to the NIC list, they are still not defence specific. They cater to items of defence, dual-use, and even those that are commercially off-the-shelf. For instance, the HS Code 88 (aircraft, spacecraft, and parts thereof) includes sub-categories such as 'gliders', 'balloons', and 'under carriages and parts thereof', which are commercially available, or at best dual-use items. But a company producing any of the above items is free to apply for a defence licence. Once it gets the licence, the company becomes a part of the defence industry, even though the item in question may not be for 'defence' purposes.

Even this loosely defined industry has another issue for companies in the Services sector. It should be noted that, as per DIPP guidelines, defence falls under the 'manufacturing' sector. Thus, companies in the manufacturing business can apply for a licence, get it (subject to approval), and become formally part of the defence industry. However, this does not apply to companies in the services sector (engineering, design, and software, etc) which do not come under the purview of 'manufacturing', and hence do not require a licence for their operations. Consequently, they are not formally a part of the defence industry, even though their services have a direct application in defence products.

Time-frame for Licencing

In addition to the above, there is no consistency for grant of licence in the existing licencing regime. As per the existing guidelines, industrial licences are supposed to be granted within 6-8 weeks.[2] However, there are many cases wherein the time taken for approval far exceeds the stipulated timeframe, primarily due to the delay in the submission of comments by the concerned ministries, including the Department of Defence Production which, as one of administrative ministries, is often accused of delaying clearances for private entities. This has sometimes led to bitter accusations and counter-accusations. For instance, in September 2011, the DIPP reportedly complained to the Cabinet Secretariat, that the DDP was 'sitting on close to 50 applications for industrial licences, some of which date back to March 2008.'[3] The

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[2] The Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, *FAQ*, http://dipp.nic.in/English/faqs/faqspdf

[3] Amit Sen, 'Industry Ministry Alleges Department of Defence Production Deliberately Holding Up Approvals for Private Players', *The Economic Times*, September 13, 2011

DIPP also reportedly told the Cabinet Secretariat that there is a 'conflict of interest in the approval process for the licences', and urged that the responsibility be instead given to the Department of Defence which is headed by the defence secretary. In its defence, the DDP has attributed the delay to ILs that cater to to low-end technology, and are of little value to the existing capability of the DPSUs and OFs. These accusations and counter accusations notwithstanding, the fact of the matter is that it is not only the DDP, but also other government departments, including the ministry of home affairs (MHA), that are also responsible for delays. This can be seen in the following table:

Table 4.1: Select Cases of Delay in Approval of Industrial Licence (As on February 2013)

Entity	Item	Application Date	Remarks
Micron Instruments Pvt Ltd	Shells, Small arms, Ammunition fuses, etc	December 28, 2006	Comments from MHA received on June 20, 2011 after two reminders.Comments from DDP, DSIR and State Government are yet to be received. Second reminder sent to DDP on July 7, 2011.
Bharat Heavy Electricals Ltd. (BHEL)	Small arms and components	January 31, 2007	Comments from DDP, MHA, DSIR and State government are yet to be received
Kirloskar Pneumatic Co. Ltd.	Design and manufacture of warships, combat vehicles, airborne equipments, arms and armaments, etc	March 26, 2008	Comments from State government and DDP received on June 11, 2008 and October 14, 2009 respecti vely. Comments from MHA are yet to be received after a reminder on June 14, 2011.
Anjani Technoplast Ltd.	Manufacture and assembly of UAV	April 16, 2009	Comments received from DDP and MHA on April 16, 2010, and January 3, 2012, respectively. Comments from DSIR and State government are yet to be received

cont ...

TATA Motors	Overhaul and upgrade of Armoured Fighting Vehicles/ Infantry Combat	June 08, 2010	DDP comments were received on March 2, 2012, after three reminders. The comments from DSIR and State government are yet to be received.
NOVA Integrated System Ltd	Electronic Warfare Systems	July 13, 2010	Comments from DDP received on August 11, 2011 without any reminder. The comments from MHA are yet to be received after one reminder on June 06, 2011. Comments from DSIR and State government are also yet be received

Note: Upon receiving an IL application, the DIPP seeks comments from the concerned administrative ministries (defence and home affairs), the concerned state governments, the Department of Scientific and Industrial Research (DSIR), and the ministry of science and technology. Decision is taken after all the stakeholders submit their respective comments.

Source: Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, http://dipp.nic.in/English/Default.aspx

Is Licencing Necessary for Defence Industry?

It is often argued that licencing is necessary for the purpose of national security as the government needs to know who is manufacturing what. This argument does not, however, seem to be tenable given the nature of the defence market, where the buyer is largely the government or the armed forces. Moreover, the export of a defence item is strictly controlled by the government and no private enterprise is allowed to sell its product to a foreign customer without the formal approval of the government. Therefore, no private firm is likely to make an investment—say for tank or warship production—if it is not sure of selling it to the government or an external customer. In other words, no private firm is likely to start defence manufacturing even if the

licencing is not mandatory. In such a situation, the waiving of the licencing requirement does not really impact national security. But the mandating of such requirements, leads to delays in approvals which may have a negative impact on private participation.

4.2 FDI in Defence Industry

As mentioned earlier, the opening up of the defence industry in 2001 also coincided with the decision to allow FDI up to 26 per cent of the total equity value of a joint venture. However, the FDI policy in its current form does not seem to have yielded the desired results. As the data available till July 2012 reveals, the cumulative FDI inflow into defence industries is $4.12 million (or Rs 19.89 crore), which is a fraction of the total investment inflows into the country and even far lower

Table 4.2: Select Sector wise FDI inflow, April 2000 to July 2012

Rank	Sector	Amount of FDI inflows ($ million)	% of total FDI inflows
1	Services Sector	34,001.45	19.24
2	Construction	21,159.86	11.97
3	Telecommunications	12,567.26	7.11
4	Computer Software and Hardware	11,567.26	6.95
5	Drugs and Pharmaceuticals	9,672.34	5.47
30	Paper and Pulp	861.07	0.49
37	Soaps, Cosmetics, and Toilet Preparations	499.99	0.28
54	Timber Products	51.65	0.03
61	Defence Industries	4.12	0.00
	Grand Total	176,882.04	100

Source: Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, *Factsheet on Foreign Direct Investment from August 1991 to December 2011*, http://dipp.nic.in/English/Publications/FDI_Statistics/2011/india_FDI_December2011.pdf

than the FDI in sectors such as sugar and timber products.[4] Interestingly, the defence industry ranks 61 among the 63 sectors where FDI is allowed (Table 4.2).

Protracted Policy Debate on Increasing FDI Limit

The absence of any meaningful FDI inflows—financial as well as technological—has been widely debated in India, with the ministry of finance (MoF) initiating it at the official level. In its *Economic Survey 2008-09* the MoF had suggested that the FDI should be increased to 49 per cent across the board, and 'up to 100 per cent, on a case by case basis, in high technology, strategic defence goods, services and systems that can help eliminate import dependence.'[5]

The MoF's recommendation was followed up by the ministry of commence and industry (MoC&I) which, in May 2010, circulated a comprehensive discussion paper on *Foreign Direct Investment (FDI) in Defence Sector*.[6] The paper made a strong case for increasing the FDI cap by stating that the 'established [global] players in the Defence industry should be encouraged to set up manufacturing facilities and integration of systems in India with FDI up to 74 per cent under the Government route.' While making the above suggestion, the discussion paper suggested that, 'for future RFPs [request for proposal] by MoD, a condition may be imposed that the successful bidder would have to set up the system integration facility in India, with a certain minimum percentage of value addition in India. The successful bidder should be allowed to bring equity up to the proposed sectoral cap.'

It is worth noting that the discussion paper's main contention of enhancing FDI cap to 74 per cent was premised on the fact that:

> The present cap of 26 per cent in FDI has failed to attract the state of the art technology in the defence sector. Increase of cap

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4 'Fact sheet on foreign direct investment (FDI) from August 1991 to December 2009', The Department of Industrial Policy and Promotion, Ministry of Commerce, Government of India, http://dipp.nic.in/English/Publications/FDI_Statistics/2012/india_FDI_July2012.pdf

5 Ministry of Finance, Government of India, *Economic Survey 2008-09*, p. 32

6 The Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, *Foreign Direct Investment (FDI) in Defence Sector* (Discussion Paper), http://dipp.nic.in/DiscussionPapers/DiscussionPapers_17May2010.pdf

> from 26 per cent to 49 per cent will not give any additional say to the foreign investor in the affairs of the company as per the provisions of the Company Law. Therefore, increasing FDI cap from 26 per cent to 49 per cent, as is being advocated by some industries associations, will not really help us in getting the best technology partners to invest in India. By merely increasing the limit from 26 per cent to 49 per cent, we may be accused by posterity of doing too little and too late. Therefore, in case we really want to have the state-of-the-art-technology, we have to permit anything above 50 per cent, if not 100 per cent. It may be, therefore, desirable to allow either 100 per cent or 74 per cent, as in the case of telecom sector. Since there is licensing provision also in the defence sector, we can refuse to permit FDI in the sector by refusing the license where the background of the company is suspect.

The argument for a FDI cap of 74 per cent has, however, not found favour with the MOD, which has so far maintained the view that the 49 per cent cap can be considered on a 'case-by-case basis', and on the condition that 'industry is able to convince us."[7] The stated position of the MoD, however, creates a potential climate of uncertainty as the foreign investors are clueless about the basis on which the MoD will determine the merit of each and every foreign investment inflow. The uncertainty is also due to the perception that it seeks to protect its own enterprises vis-à-vis the private sector which are likely derive greater benefit from FDI.

How Much FDI?

Notwithstanding the MoD's stated position on FDI, the issue of what the ideal cap on it should be remains unresolved. In the following paragraphs, various options within the existing framework of India's FDI policy—which allows foreign investment in four maximum limit-based categories: 26 per cent; 49 per cent; 74 per cent and 100 per cent—are discussed.

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[7] 'Government considering 49 per cent FDI in select defence areas: Antony', *domain-b.com*, September 20, 2008, http://www.domain-b.com/economy/Govt/20080920_government.html

Increasing the cap from 26 per cent to 49 per cent will no doubt enable foreign investors to get almost half the returns on their investment. Although this may attract foreign investors from the financial point of view, it may not be so attractive in terms of control and management. This is because increasing the FDI cap to 49 per cent from the present levels does not give the investor any additional say in the affairs of the company, as has been pointed out by the DIPP, and as per the provisions of the Indian Company Law. In other words, for a technology investor who is concerned more about control and management, the 49 per cent FDI cap offers little incentive in comparison with the 26 per cent FDI provision. However, the same investor would certainly be tempted if the cap is raised to 74 per cent, thus giving him not only more than majority control but also the enhanced scope for returns on his investment. The further question that arises is whether the 74 per cent cap is enough to attract the best technology. Probably not. In the case of some niche technologies, foreign investors would like to retain absolute control over management - which will require 100 per cent FDI.

However, it should be noted that FDI above 49 per cent, which gives management control to the foreign investor, raises concerns regarding its impact on the national defence industrial base and broader national security. Such concerns could be mitigated by not limiting FDI to a certain percentage of the equity flow but by adopting a flexible policy. This would involve reviewing each defence-related FDI and undertaking an impact analysis in accordance with a set of well calibrated parameters. Since India has a cap-based FDI approach, the ideal policy would be to allow up to 100 per cent FDI, subject to a detailed review of each incoming investments. The FDI percentages could be assigned as per the review results, which can vary from zero to 100 per cent. If an investment is found unacceptable because of certain concerns, it can be rejected. If an investment is deemed beneficial only on financial grounds, the cap may be fixed either at 26 per cent, or at a maximum of 49 per cent; if it involves a meaningful technological inflow, the cap could be raised up to 74 per cent; and the cap may be further raised to 100 per cent if the investment brings in high-end technology that benefits Indian industry and defence.

In order to take the more flexible path, the existing inter-agency, the Foreign Investment Promotion Board (FIPB) which is responsible for

approving FDI based on the existing cap-based regulations, needs to be empowered to examine all FDIs in the defence industry. The FIPB may also be empowered to stipulate additional security measures for foreign investors in order to mitigate any concerns which may arise in the due course of the investigation. In case of FDI beyond 49 per cent, conditions can also be imposed on the proposed foreign investor so as to allow him to operate in India as an Indian company and that, except for the financial benefit, no technological or other benefits be transferred, without permission from the Indian authorities, to the parent or any other country. Thus, instead of taking a rigid and fixed-cap approach, which may obstruct some desirable inflows involving critical technologies, a complete yet case-by-case liberalisation of the FDI policy would enable merit-based selection.

Confusion over FDI in Services Sector

As per present provisions, the cap of 26 per cent FDI applies to the defence companies in the manufacturing sector. It does not seem to be applicable to the companies in the services sector even if the services of these companies have a direct defence application. These companies find it difficult to develop a strategy for becoming an Indian Offset Partner (IOP). The MoD, it is believed, insists that the foreign exposure of these companies should not exceed 26 per cent, although certain modifcations have been made in the revised defence offset guidelines of 2012. The lack of clarity could discourage many reputed services sector companies in India from participating in defence offsets.

Timeframe for FDI Clearance

Although as per the DIPP the decision on FDI cases will be normally communicated within a matter of two-and-a-half months but typically, the DIPP has taken four to six months to take its decision. Combined with the time taken for an IL, the total time before the start-up can be between 10 to 12 months.

Ambiguity in Calculation of FDI

The mode of calculating FDI in the defence industry has led to some confusion. As per the current guidelines issued by the DIPP, foreign investment in an Indian company is calculated by taking into account both direct and indirect investment (direct investment is one which comes directly from a foreign country whereas indirect investment is

one that comes through another company in India having foreign equity). Technically, and as per DIPP rules, if the indirect investment comes from a company in India in which the foreign partner has a minority share, the said investment is not deemed as foreign investment. However, the MoD does not buy this argument, and this has led to rejection of some proposals (Annexure VII provides a case study of differences in interpretation of ownership and control by different ministries of a FDI proposal by EADS and L&T). Therefore, it is highly desirable that the government articulate a uniform policy for the calculation of FDI in defence.

4.3 Industry-Centric Procurement Procedures

The MoD has so far undertaken seven[8] major revisions of DPP, and created a number of procurement categories to provide the Indian industry, including the private sector, greater access to defence production (see Table 4.3 for aspects of procurement categories). In 2003, it brought out a revised Defence Procurement Procedure, known as (DPP-2002 (Version June 2003)), with a new procurement category, 'Buy and Make' for licenced production by domestic enterprises of foreign-made defence items through the transfer of technology (ToT). This was to enable Indian industry to acquire expertise in the manufacturing of complex defence systems without investing time and resources in R&D—an area in which the Indian industry is very weak.

To provide further opportunity to Indian defence entities, including those in the private sector, the DPP-2006 (promulgated in August 2006) sub divided the original 'Buy' category into 'Buy (Indian)' and 'Buy (Global)'. The 'Buy (Indian)' allows procurements from the Indian vendors only—that is, without going directly to foreign suppliers for the complete system. To ensure that the Indian supplier makes meaningful value additions, the category mandates a minimum 30 per cent indigenous content in the final product.

However, the major highlight of the DPP-2006 was the inclusion of the 'Make' category to facilitate indigenous design, development, and production. Under the 'Make' category, projects categorised as 'High

[8] These revisions were carried out in 2002, 2003, 2005, 2006, 2008, 2011, and 2012

Technology Mature Systems' are to be undertaken by the Ordnance Factory Board, DPSUs, the Indian industry, and industries identified as Raksha Udyog Ratna (RUR)/Consortia in a level playing field. To promote indigenous R&D within the industry, the 'Make' procedure also has a provision under which industry can avail of up to 80 per cent of the developmental cost from the MoD.

Further to the announcement of the 'Make' procedure, the MoD issued an Amendment to DPP-2008, in November 2009. The Amendment introduced a new 'Buy and Make (Indian)' category. As per the category, procurement orders will be placed on Indian companies who in turn will negotiate with interested foreign companies for technical and other production arrangements. Unlike the 'Buy and Make' category, in which the MoD is largely responsible for technical cooperation with foreign companies for indigenous production, the new category places the sole responsibility on the Indian industry. To obviate the possibility of Indian companies becoming trading centres for foreign companies, the MoD has mandated that the indigenous content, should be at least 50 per cent on cost basis.

Although the MoD's successive revisions of DPP have paved the way for the domestic industry's greater involvement in defence production, there are two critical hurdles that inhibit its meaningful contribution. These hurdles are primarily the complexities involved in identifying the 'Make' and 'Buy and Make (India)' projects, and the lack of accountability on the part of state owned enterprises for ensuring self-reliance.

Procurement Complexities

Under the DPP provisions, the four broad categories—'Buy', 'Buy and Make', 'Make' and 'Buy and Make (Indian)'—follow at least two different processes. For the first two categories, the process is relatively simple, with the formulation of Services Qualitative Requirements (SQRs) being the starting point for the procurement of an item for the armed forces. Post formulation of the SQRs, a 'Statement of Case' is prepared by Service Headquarters (SHQ) for the approval of the Defence Acquisition Council/Defence Procurement Board (DAC/DPB). The 'Statement of Case' makes a case for the necessity of an item, and advises on the mode of procurement, i.e., either through the 'Buy' or the 'Buy and Make' route.

Table 4.3: Aspects of India's defence procurement categories

Procurement (Sub-) Category		Meaning	Indigenous Requirement	Nature of Involvement of Domestic
'Buy'	'Buy Indian'	Outright purchase	30 per cent	100 per cent-owned Indian company, majority-holding Indian JV
	'Buy Global'		Not Applicable	A majority holding Indian company can participate in global tender
'Buy & Make with ToT'		Import followed by indigenous production through ToT	Supposed to increase to 100 per cent as production matures	A nominated majority holding Indian company
'Buy & Make (Indian)'		Indigenous production with partnership with foreign company	50 per cent	Majority holding Indian JV
'Make'		Indigenous R&D, design, development and production of high technology complex systems and upgrades	Minimum 30 per cent in the developed prototype	Indian Company
Strategic, Complex and Security Sensitive Systems		Indigenous R&D, design and development	Supposed to be 100 cent	DRDO
Inter Government Agreement		Procurement from friendly foreign countries based on Govt-to-Govt agreement	Not Applicable	Not Applicable

Source: Table prepared by the author based on the information contained in Ministry of Defence, Government of India, *Defence Procurement Procedure 2011 (Capital Procurement)*

However, the categorisation of any item as 'Make', or 'Buy and Make (Indian)' involves at least one more step that makes it virtually un-operational. In the case of the 'Make' category, the Headquarters Integrated Defence Staff (HQ IDS) is mandated to undertake a feasibility study[9] of all projects under the LTIPP.[10] This condition is not applicable under the 'Buy' and 'Buy and Make' categories. In the case of the 'Buy and Make (Indian)' category, the SHQ is required to prepare the Capability Definition Document, for outlining the 'requirement in operational terms', and describing the 'present capabilities determined on the basis of the existing equipment, manpower, etc.'[11]

These additional steps make it difficult to categorise items under the 'Make' and/or 'Buy and Make (Indian)' heads, which form the core of India's indigenous design and manufacturing capabilities. The difficulty is enhanced because of the availability of easier options under the 'Buy' and/or 'Buy and Make' categories to procure virtually all items of 'contemporary technology' with the QRS modified to encompass all 'essential parameters' to avoid the complex task of pursuing feasibility studies and preparing capability definition documents. This is the reason why, nearly six years after the inclusion of the 'Make' category, no major projects have so far been sanctioned under it. It is also the reason why the MoD found it difficult to award the 'Avro Replacement' tender (to procure 56 transport aircrafts for the Indian Air Force) under the 'Buy and Make (Indian)' category.

As regards the Avro programme, contrary to expectations that the MoD would float the tender under the 'Buy and Make (India)' category, the tender has been floated under the 'Buy and Make' category. This deviation reveals two weaknesses in the system. First, it shows that the MoD cannot identify Indian private companies who can take the lead in contract execution. Second, handing over responsibility to foreign companies also gives them greater leverage. It is a natural business instinct that a foreign company will be more inclined to select an Indian

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9 The objective of the feasibility study is to ascertain domestic capability to design and develop a system

10 'Defence Procurement Procedure: Capital Procurement 2008', Ministry of Defence, Government of India, p. 146

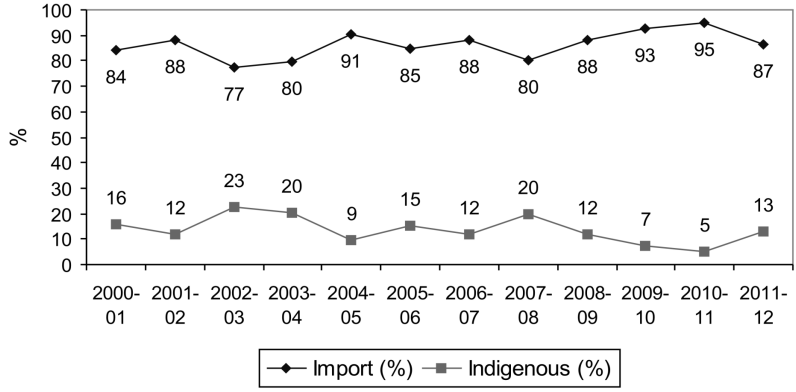
11 Ibid. p. 6

partner who offers greater concessions. This is more so given the Indian system of awarding contracts to vendors based on the L-1 criteria rather than on the basis of the content being produced indigenously.

Lack of Accountability

Historically, licence-based production has been preferred for India's defence industrialisation process. This continues even today, with major projects such SU-30 MKI, HAWK AJT, Scorpene class submarines, and T-90 tanks being undertaken at various state-owned enterprises, with transfer of technology from foreign counties. The production of these high-value items in India does not, however, translate into enhanced self-reliance. As the statistics in Chapter II (Tables 2.5 to 2.13) clearly show, state-owned enterprises are heavily dependent on foreign sources. In the case of HAL, the largest Indian defence enterprise, the foreign dependence for raw materials, parts, components and raw materials is sometimes as high as 95 per cent (Figure 4.1).

Figure 4.1: HAL's Consumption of Raw Materials, Components & Spare Parts: % Share of Import and Indigenous



Source: Author's database

One of the reasons for high import dependency for indigenous production is the lack of accountability on the part of the licence manufactures to ensure the desired level of indigenisation. What is noteworthy here is that, unlike the indigenisation requirements as mandated under the 'Buy (Indian)' and the 'Buy and Make (Indian)' categories—wherein minimum indigenisation requirements are

stipulated—the DPP does not mention such requirements under the 'Buy and Make' category. So far, this latter category has been used to award major contracts to the DPSUs and OFs. Even if one assumes that the MoD does insist on certain levels of indigenisation when the contract is signed for licence manufacture, its own enterprises do not appear to be seriously adhering to it. The result is that the business of license manufacturing has mostly remained an exercise of assembly, where the imported items are simply put together, often with foreign assistance.

4.4 Identification of Raksha Udyog Ratnas (RURs)

One of the most significant policy measures taken by the MoD to encourage the production of major defence items in the private domain, is the set of guidelines laid down in the DPP of 2006 to designate private sector industry leaders, as Raksha Udyog Ratnas (RURs)/ Champions. The guidelines stipulate certain objective criteria that the company has been registered in India for at least 10 years; has capital assets and a turnover of not less than Rs 100 crore and Rs 1000 crores in the previous three years; a minimum credit rating equivalent to CRISIL/ICRA 'A'; a willingness to invest in R&D; and quality certification from recognised institutes - among others—for nomination. The objective of these guidelines was to develop private companies as Tier-I companies, systems integrators/producers of major platforms and weapon systems for the armed forces. To ensure a level playing field for RURs vis-à-vis existing public sector enterprises, the guidelines stipulate that the industry champions would be 'treated at par with Defence PSUs, which are selected by the Government for receiving technology, and undertaking license production with TOT from overseas sources.'[12] In addition, the DPP provides that the RURs will be eligible to bid for 'Make' category projects in which the MoD would share 80 per cent of the developmental cost.[13]

Consequent to the promulgation of the RUR guidelines, an expert committee chaired by Prabir Sengupta, former secretary, department

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[12] 'Defence Procurement Procedure: Capital Procurement 2006', Ministry of Defence, Government of India, p. 153

[13] Ibid. p. 146

of defence production, was constituted in May 2006.[14] The report of the committee, submitted to the MoD in June 2007, is yet to be implemented. As regards the selection, it was reported that the committee could recommend only a handful of companies—totalling 13 in number[15]—as against the 'large number' of companies that had expressed an interest in being accredited as RURs.

Although the MoD has so far not ruled out the RUR option, industry associations have expressed the concern that any delay in the identification process will hinder the growth of the private sector. They also cite that the non-notification of RURs has, among other issues, hindered the participation of the private sector in the categorisation process, resulting in some projects—which should have ideally been in the 'Make' category—being allocated to PSUs under the 'Buy and Make' category in spite of 70 per cent import content.[16] Sensing the importance of the RURs, and the concerns of the private sector, the Parliamentary Standing Committee on Defence had 'strongly desire[d] that the Government should take expeditious steps to select and notify RURs at the earliest so that the misgivings among the defence industries are removed, and they gear themselves up for effective participation in the national effort for self-reliance.'[17]

4.5 Offset Policy

To leverage its huge arms imports bill (Rs 24,194 crore in 2011-12) for building its military industrial complex, the MoD in 2005 announced a formal offset policy as part of its Defence Procurement Procedure (DPP). The policy, which was given concrete shape a year later in DPP-2006, stipulates a minimum 30 per cent offset in all capital acquisitions

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14 'Committee to identify Raksha Udyog Ratnas submits report', Press Information Bureau Government of India, June 7, 2007

15 These companies are Tata Motors, Larsen and Toubro, Tata Power Company, Mahindra and Mahindra, Ashok Leyland, Tata Advance Materials, Kirloskar, HCL, Godrej and Boyce, Bharat Forge, Infosys Technologies, Wipro Technologies, and the Tata Consultancy Services. See Ravi Sharma, 'Defence Ministry may notify companies cleared for Raksha Udyog Ratna status', *The Hindu*, August 8, 2008

16 Standing Committee on Defence, 2008-09, 14th Lok Sabha, *Indigenization of Defence Production: Public–Private Partnership*, 33rd Report (Lok Sabha Secretariat: New Delhi, 2008), p. 23

17 Ibid. p. 71

valued at Rs 300 crore or more, and categorised as 'Buy (Global)' and 'Buy and Make with Transfer of Technology'. By August 2012, the MoD had signed 19 offset contacts valued at Rs. 25,000 crore. Fourteen of these contracts pertain to the air force, and rest are meant for the navy (Table 4.5).[18]

Table 4.5: Offset Agreements

S No	Name of Service	Name of Scheme
1.	Air Force	Medium Power Radar
2.		Mig-29 Upgrade
3.		Mi-17 V-5 Helicopters(MLH)
4.		Medium Altitude EO/IR recce System for Jaguar Aircraft
5.		HAROP UAV with associated equipment
6.		C-130 J-30
7.		Low Level Transportable Radar (LLTR)
8.		WIP Helicopter
9.		CBU-105 Sensor Fused Weapon
10.		C-17 Aircraft
11.		Mirage-2000 Upgrade
12.		MICA Missile for Mirage-2000
13.		NGPGM
14.		Basic Trainer Aircraft
15	Navy	Fleet Tanker
16		Long Range Maritime Reconnaissance Anti Submarine Warfare (LRMR ASW) Aircraft
17		Fleet Tanker (Option Clause)
18		Air Route Surveillance Radar (ARSR)
19		Unmanned Aerial Vehicle (UAV)

Source: Press Information Bureau, Government of India, 'Offset Agreements', August 13, 2012

[18] 'Offset Agreements', Press Information Bureau, Government of India, August 13, 2012; Ajai Shukla, 'Defence offsets cross Rs 25,000 cr bigger contracts loom', *Business Standard*, August 14, 2012

Defence Offset Guidelines (DOG), 2012

The MoD has made several revisions to the formal offset policy of 2005, with the latest one coming into force from August 1, 2012. Some of the salient features of the latest revised policy followed by a critical analysis are as under:

Clarification of Scope and Quantum of Offsets

As in the previous version, the new guidelines also stipulate a minimum of 30 per cent offsets in 'Buy (Global)' and 'Buy and Make with Transfer of Technology (ToT)' contracts valued at Rs. 300 crore, or more (in the latter case, the quantum of offsets of minimum 30 per cent is mandated on the foreign exchange component of the contract). Unlike the previous version, however, the DOG has clarified that an Indian company, or its joint venture participating in 'Buy (Global)' contracts, is exempted from offset obligations provided the product in question has indigenous content of a minimum of 50 per cent by value. In case the indigenous content is below 50 per cent, offsets are mandatory but only for the part which involves the foreign component.

Expanded Avenues for the Discharge of Offsets

The scope for the discharge of offset obligations by foreign OEMs has been expanded by: permitting investment in 'kind' in the Indian industry; by allowing the DRDO to acquire a select list of high technologies; and by increasing the number of Indian Offset Partners (IOPs). As per the revised DOG, the investment in 'kind' is allowed in the form of the transfer of technology (ToT) or the transfer of equipment (ToE) for the manufacture and/or maintenance of permitted items. A difference has been made by way of mandating that while the ToT can either be through the equity or non-equity route, the ToE has to be only through the non-equity route.

In case the foreign original equipment manufactures (OEMs) choose technology transfer as an option for the discharge of offsets, the guidelines mandate that such ToT should be provided without a license fee, and be comprehensive enough to cover all the documentation, training, and consultancy required for full ToT. The costs of the civil infrastructure and equipment, however, are excluded from the calculation of offset obligations. The guidelines also mandate that 'there

should be no restriction of domestic production, sale or export' resulting from such ToT. To ensure that ToT does not lead to the 'dumping' of foreign technology, and to guard against undue pricing of technologies, the guidelines have mandated stringent buy-back and value addition conditions. As per these conditions, foreign companies will get offset credit not for the value of the technologies transferred; but for the value addition (in India resulting from such ToT), and their eventual buy-back by foreign companies (see Table 4.6).

Table 4.6: Aspects of India's Defence Offset Guidelines 2012

Discharge of Offset Obligations: Avenue Type	Multiplier	Banking (7 years)	Condition
A. Direct Purchase of permitted goods/services	1.5 if IOP is an MSME	Allowed	Offset credit for value addition to be determined by subtracting value of imported items and any fee/royalty paid to foreign companies.
B. FDI in qualified Indian Industry	1.5 if IOP is an MSME	Allowed	FDI is allowed upto 26 per cent in case the IOP belongs to defence manufacturing sector.
C. ToT (both through equity (i.e., JV) or non-equity route)	1.5 if IOP is an MSME	Allowed	Offset credit is to be estimated at the rate of 10 per cent of value of buy-back of items for which ToT is used. Further, the actual value addition in India will be taken for estimating the value of buy-back.
D. Transfer of equipment (only through non-equity route)	1.5 if IOP is an MSME	Allowed	Offset Credit is subject to 40% buy-back (by value) of eligible items within the period of offset contract.

cont ...

E. ToT or transfer of equipment to DRDO labs, ABW, BRD and Naval Dockyards	Not allowed	Not allowed	
F. Technology acquisition by DRDO	Up to 3.0:2.0 if the ToT is meant for unrestricted domestic production for armed forces 2.5 if the ToT is meant for unrestricted domestic production for both civil & military use 3.0 if ToT is meant for unrestricted production for domestic (civil & military) and export purpose	Not allowed	Offset credit for the critical technologies listed in new guidelines. The technology list is to be reviewed periodically

Notes: A minimum 70 per cent of offset obligations are mandated to be discharged by any one or a combination of avenue types from A to D in this table. Discharge of pre-approved banked offset credits, where allowed, can not exceed 50 per cent of total offset obligations under each procurement contract. Banked offset credits are not transferable except between the main supplier and his Tier-I sub-suppliers.

Source: Prepared by author based on information contained in Revised Defence Offset Guidelines 2012.

In the case of ToE, the conditions are somewhat less stringent. Vendors are permitted to claim credits for the entire value of equipments they transfer to their Indian offset partner. However, this is subject to what seems to be OEM's minimum buy-back of permitted items to the tune of 40 per cent.

Technology Acquisition (TA) by the DRDO is permitted as per a select list of high-technologies, that are to be reviewed and updated periodically. The list, which presently consists of 15 categories, includes fibre laser technology; propulsion, aerodynamics and structures for hypersonic flights; nanotechnology-based sensors and displays; and pulse power network technologies, among others. The technologies offered by foreign vendors are to be to be evaluated by the Technology Acquisition Committee (TAC), a multi-disciplinary body comprising of DRDO's Directorate of Industry Interface and Technology Management (DIITM), the additional financial advisor to DRDO, and representatives from the SHQs, among others. To ensure a two-way dialogue process between the DRDO and the foreign vendor (for better understanding of each other's position), a window for detailed discussions is also provided.

The list of Indian Offset Partners (IOP) has been expanded to include hitherto excluded government institutions and establishments (including the DRDO) that are engaged in the manufacture and maintenance of eligible items. The new entrants are allowed to receive both ToT and ToE as offsets for augmenting their 'capacity for research, design and development, training and education.' However the purchase from, and equity investment in these institutions by foreign OEMs, is not permitted.

Provision of Multiplier

The revised DOG, for the first time, includes multipliers to incentivise investment in select areas. The maximum value of multipliers is kept at three, which means that a foreign company can claim credits up to three times of its actual offset investment. However, multipliers are restricted to two areas: micro, medium and small enterprises (MSMEs), and technology acquisition by the DRDO. In the case of MSMEs, a multiplier of 1.5 is allowed when an offset investment takes place in the form of a purchase from, FDI in, and investment in 'kind', in these enterprises. Higher multipliers of 2.0, 2.5, and 3.0 are reserved only for the technology acquisition by the DRDO. The higher the multiplier, the greater the technology leverage that the DOG expects to achieve. The maximum multiplier of 3.0 is allowed only when a foreign company provides a listed technology, without any restriction on its volume of production and sales, including exports.

Extended Banking Period

The banking of the offset provision, which was first introduced in DPP-2008, has so far received a lukewarm response from foreign companies. The primary reason for this was the limited validity period (a maximum of two-and-a-half years). The revised DOG has extended the banking period to seven years. The banking provision is, however, allowed in the case of purchase from, investment in, and technology/ equipment transfer to, Indian industry. Technology acquisition by the DRDO and government establishments/institutions has been excluded from the banking purview.

As in the case of the previous guidelines, the revised DOG also does not permit offset trading by restricting the transfer of banked offset credits to the main supplier and its sub-suppliers within the same acquisition proposal. However, unlike the previous version, the revised document has stipulated that the pre-approved banked credits cannot be used for more than 50 per cent of total offset liabilities arising from a future procurement contract. This would mean that a foreign company would require at least two procurement contracts to discharge its banked offsets credits. To ensure that the banking proposals of the vendors are dealt with in a time-bound manner, the DOG has provided an 8 week window for disposal of such cases.

DOFA to DOMW

The new DOG provides for the Defence Offset Management Wing (DOMW), which will replace the existing Defence Offset Facilitation Organisation (DOFA). The Wing, as in past, will be under the department of defence production. However, unlike DOFA, the DOMW is now visualised as a more powerful organisation in matters related to post-defence offset contract management. The most critical aspect of its power lies in its being one of the repositories of the signed offset contracts, which the DOFA did not have access to. Among others, the DOMW is tasked to formulate offset guidelines; participate in technical and commercial offset negotiations; monitor/audit offset programmes; administer offset penalties in the case of default by vendors; implement offset banking; and assist vendors in all offset-related matters.

Provision for Supervision at DAC Level

The monitoring aspect in the revised DOG has been further strengthened by way of an oversight provision at the highest decision-making level in the MoD. The revised policy stipulates that DOMW 'will submit an annual report to the DAC in June each year regarding the status of implementation of all ongoing offset contracts during the previous financial year.' This will ensure regular supervision and possibly its quality.

Clarity in Industrial Licencing and FDI Issues

From the private sector perspective, one of the key hurdles in the way of participation in offset programmes was the different interpretations of industrial licencing requirements and the FDI exposure of IOP. The MoD was believed to have taken a stand that the IOP, irrespective of its being in the defence or non-defence sector, must have an industrial licence, and that its FDI exposure must not exceed 26 per cent—the commerce ministry's guidelines state that an Indian company is subject to IL and FDI restrictions if its activities fall only in defence manufacturing. To overcome the above differences, the revised guidelines have made it clear that the provisions of the DOG will be in 'harmony and not in derogation of any rules and regulations stipulated' by other agencies. If this is followed in letter-and-spirit, it would facilitate the participation of non-defence manufacturing companies in offset programmes.

Miscellaneous Provisions

Apart from the above provisions, the revised guidelines have expanded the list of eligible products/services against which offsets can be discharged; extended the offset discharge period; and put a cap on penalty in case of default. The list of eligible products/services has been mainly expanded in the renamed category of 'Products for Inland/Costal Security' (known earlier as 'Products for Internal Security'). An additional four groups have been included in this the category. The 'Civil Aerospace Products' and the 'Service(s)' categories have been expanded, with the addition of one group each. In the 'Defence Products' category, the number of groups has remained the same; but the group under Warship Building has been expanded by including four distinct sub-groups with greater clarity. In all, there are now 39

group of products/services in which the foreign vendors are allowed to discharge their offset obligations. These groups are apart from the list of high technologies (meant for DRDO), against which foreign vendors are allowed to discharge their offset obligations (see Annexures VIII and IX for the list of products, services and technologies eligible for discharge of offset obligations).

Regarding the offset obligation discharge period, the new guidelines have extended the period by two years from the date of the main procurement contract (which is inclusive of the date of warranty). However, the extension is subject to the vendors' submission of an additional performance-cum-warranty bond equivalent to the value of offset obligations falling beyond the period of the main procurement contract. The bond is required to be submitted six months prior to the expiry of the main performance-cum-warranty bond.

While the revised DOG has kept the annual penalty, in case of default on the part of the vendor, at five per cent, it has now mandated that the overall penalties cannot exceed 20 per cent of the total offset obligations during the main procurement contract (there will be no cap on penalty in case of default during the extended period).

Critique of Offset Policy of 2012

Unrealistic Indigenous Requirement and Timeframe Under 'Buy (Global)'

While the DPP tacitly defines an Indian defence item as one with a minimum 30 per cent indigenous content, the offset provisions for Indian companies under the 'Buy (Global)' contract seeks to nullify this a definition. Beyond the definitional issues, what is far more important is the potentially damaging impact of the revised DOG's 50 per cent indigenous requirement—and the timeframe to achieve it—on the domestic defence industry. It is well known that very few Indian companies can offer products with 50 per cent or more indigenous content. This is perhaps the reason why the indigenous requirement under the 'Buy Indian' contracts has been kept at 30 per cent. Given this, it is inconceivable to imagine why the requirement has been suddenly pegged at a significantly higher level. Moreover, even if it is assumed that some Indian companies would like to achieve the stipulated indigenisation level, the time frame provided in the DOG simply does

not encourage it. Indian companies are now required, as per the DOG, to prove indigenous content at the time of the submission of technical bids, which means they need to have 50 per cent indigenous content even before the actual production commences! This is not only unrealistic but also discourages any Indian company that wants to compete at the global level.

Value Addition: Exclusion of Services

In a major deviation from the previous version of the policy, the revised DOG has explicitly excluded 'services' from the purpose of estimating value addition in India (the previous guidelines were silent on this aspect). With the addition of R&D services to the list of 'services', the explicit exclusion of services offers far greater leverage to foreign companies, and far less incentive to the eligible Indian manufacturing sector. A simple theoretical illustration will help to understand the grave potential consequences. For example, a foreign company opts for 'training' (an eligible service) as a means of discharging its offset obligations worth Rs 10 crores. Since the foreign company is at complete freedom to choose an Indian Offset Partner (IOP), and assuming that there is a cut-throat competition within the Indian service sector to participate in the offsets programme, it becomes easier for the foreign company to select one IOP which is willing to provide maximum concessions.

Let us assume that the IOP agrees to a proposal to accept some surplus trainers from the payroll of the foreign company at the cost of Rs 8.5 crore. Since value addition is not a factor in determining the offset credit, the foreign company is entitled to claim offset credits, including for the amount spent on its own trainers. In this case, the foreign company gets Rs 10 crore worth of offset credits—the amount will increase to Rs 15 crore if IOP is a MSME—against the actual incurred cost of Rs 1.5 crore which the IOP receives for becoming the partner. Had the value addition been a factor in determining offset credit, the foreign company would have got offset credits only for Rs 1.5 crore. Clearly, the loser in this case is Indian industry (if not the IOP which acts as a mere trading house of services, and cannot see beyond its own business interests) which loses out on Rs 8.5 crore worth of offset business.

The above loss is probably less in comparison with the negative impact on the permitted manufacturing sector. With the increase in the number

of categories in the services list, and the cost advantage accorded to the foreign vendor in discharging offset obligations in this sector, the OEMs have virtually no incentive to resort to eligible manufacturing products. In other words, the Indian manufacturing sector is at a tremendous disadvantage vis-à-vis their brethren in the services sector. This will further diminish their prospects of working with foreign companies, or becoming a part of global supply chain.

Advantage to Non-Defence IOP

The revised DOG might have clarified the position vis-à-vis licencing and FDI regulations as stipulated by other government agencies. At the same time, it has created a unique situation which has far reaching implications for the defence and non-defence sectors. For an Indian private company, defence manufacturing is subject to mandatory licencing and a 26 per cent FDI cap. These restrictions are, however, not applicable to companies in civil aerospace, inland/coastal security, and the services sectors. In other words, companies in these sectors can become IOP without the licencing and FDI constraints that their counterparts in defence manufacturing would face. This clearly tilts the level-playing field in favour of the non-defence manufacturing sectors. Foreign companies will be far more inclined to choose a non-defence IOP who does not require a licence, and in which the foreign equity stake can be more than 26 per cent. On the latter aspect (equity stake), the incentive for the foreign company is far more. Since there are no restrictions on the foreign equity stake in an IOP from the non-defence manufacturing sector, theoretically, a foreign company's wholly-owned subsidiary registered in India can be a front organisation for the execution of offset programmes on behalf of its parent company! This may not be the true intent of the revised DOG, but the MoD should not be surprised if it finds this happening one day.

Ambiguity in Date of Reckoning of Offset Transaction With Regard to ToT & ToE

The new guidelines might be innovative in terms of allowing technologies and equipment as valid methods for the discharge of offsets; but there is an ambiguity in the reckoning of the date of the completion of transactions arising from such transfers. The ambiguity is due to the lack of harmony in the explanation in two different places

in the revised offset guidelines. In the section on the Valuation of Offsets (paragraph 5.13), the DOG states that the 'date of discharge of offset obligation [with respect to FDI, ToT, ToE and TA by DRDO] shall be reckoned as the date of the completion of transaction, based on documentary evidence.' Going by this, a foreign vendor can claim offset credits for, say, transferring equipment to an Indian entity after he gets the final payment from the buyer, and submits the relevant documentary proof with the MoD. This may be the premise of his claim for offset credit; but the MoD may not buy such an argument. Given sensitivity and oversight concerns, the concerned official in the DOMW can invoke the section on Mandatory Offsets (paragraphs 5.6 and 5.7), which gives him the power to reckon such credit only when the foreign company completes the buy-back of at least 40 per cent of eligible items from Indian industry (as is the case of the transfer of equipment). Since buy-back involves a comparatively longer period (and includes an element of cost as also the prospect of penalty in case of default), the vendor may opt for arbitration to prove that his conviction is right.

Lack of Clarity on Government Institutions/Establishments

The new DOG does not name the government institutions/establishments that have been made additional eligible entities and can receive offsets in the form of ToT and ToE for their capacity building. However, the names are mentioned in the MoD's press release of August 2, 2012, and include DRDO laboratories, Army Base Workshops, Air Force Base Repair Depots, and Naval Dockyards, etc. The list in the press release is not comprehensive as it uses the term 'etc.'—suggesting that some more names could be added to it subsequently. This confusion apart, it is also not clear why instead of the DOG—which being a part of DPP, is the ultimate reference document—the MoD has chosen to issue a press release to identify these entities. Moreover, it is also not clear why these institutions are kept away from the banking provisions.

4.6 Defence Production Policy

In early 2011, the MoD unveiled the first ever Defence Production Policy (DPrP), to give a focussed direction to the industry. The policy document, which came into force from January 1, 2012, lists out the following three broad objectives:

1. To achieve substantive self reliance in the design, development, and production of equipment/weapon systems/platforms required for defence in as early a time frame as possible;

2. To create conditions conducive for the private industry to take an active role in this endeavour; and

3. To enhance the potential of SMEs in indigenisation and to broaden the defence R&D base of the country.

To attain this crucial objective of self-reliance, the new policy document has made certain changes, starting from the planning level. The DPrP has mandated that, based on the approved 15-year Long Term Integrated Perspective Plan (LTIPP) of the armed forces, equipment 'required 10 years or so down the line, will be by and large developed/ integrated/made within the country.' If the Indian industry is not in a position to deliver the equipment in the required time, and as per the specifications and quality, then the system would be procured from foreign sources. However, justification has still to be given explaining the nature of the weakness of the domestic industry, of the 'urgency and criticality of the requirement', and also of the 'the time taken in the procurement and delivery from foreign sources vis-à-vis the time required for making it in the country.' The justification is to ensure that domestic companies are not subject to discrimination vis-à-vis their foreign counterparts, and also to identify the key weaknesses afflicting the domestic industry. As regards eliminating domestic industrial weakness, the DPrP is categorical in saying that 'efforts would be made in progressively identifying and addressing any issue which impacts, or has the potential of impacting, the competitiveness of the Indian industry in comparison to foreign companies.'

Till the new issues are known, The DPrP has identified some key measures for promoting domestic industry, with a focus on greater private sector involvement in defence production—the second objective of the document. From the procedural point of view, the policy document intends to simplify the 'Make' category of the MoD's Defence Procurement Procedure (DPP), which gives Indian companies a major responsibility in terms of design, development, and production of a 'high technology complex system'. It is to be noted that the 'Make' category, despite its best intentions, has so far proved largely unsuccessful

because of procedural complexities vis-à-vis other categories (such as 'Buy', and 'Buy and Make'). As a result, very few projects have been categorised under this head. The simplification of the category, as pointed out in the DPrP, is intended to put the 'Make' category at par with other categories in terms of procedural rigour so that the domestic industry gets a change to design and develop complex defence systems.

In addition, the document has also urged the service headquarters (SHQs) to 'exercise due diligence' while laying down the operational and technical parameters of equipment (known in Indian military parlance as qualitative requirements or QRs) for the items to be developed/produced by the domestic industry. The emphasis on QRs to facilitate domestic development/production marks a shift from the current practice, wherein the domestic industry, particularly the private sector, is hardly consulted when the parameters are being laid down. This has often led to the industry complaining about their capabilities being ignored in the selection of equipment. In the case of the 'feasibility and practicality of the QRs' in relation to domestic industrial capability, the DPrP mandates that the SHQs will take into account the capability of the domestic industry while preparing the operational and technical parameters of the weapons system they want to procure. This in turn suggests a closer cooperation between the armed forces and the industry for exploring indigenous solutions.

To enable the domestic industry to meet the requirements of the armed forces, the DPrP has also emphasised on synergy amongst the various domestic players, including the academia, R&D institutes, as well as technical and scientific organisations. To harness this synergy, the document is categorical that 'all viable approaches such as the formation of consortia, joint ventures, and public" private partnerships' would be examined for enabling the domestic industry to meet the requirements of the armed forces within the timelines and prices that are globally competitive.

At the same time, the document has also emphasised 'incremental changes' and technology absorption by the industry. The incremental approach is designed to give the industry time to move up the technological ladder, progressing from Mk-I to Mk-II, and so on. It is intended to serve both the operational requirements of the armed forces and, at the same time, allow the industry to mature on the

technological front. In case where the industry is involved in production with technological assistance from foreign OEMs, the industry is mandated to absorb the necessary technology. The document gives the responsibility for this to four organisations: Department of Defence Production (DDP), Defence Research and Development Organisation (DRDO), Headquarters Integrated Defence Staff (HQ IDS) and SHQs. These organisations will be 'involved in identification and evaluation of requisite technology', and further ensure that the 'appropriate technology transfer' takes place in the Indian industry.

Recognising the importance of R&D for defence industrial development, the DPrP has included a provision to promote and broaden research activities across the industry, including in SMEs—the third and fourth objectives of the policy document. A 'separate fund' will be set up to promote research in 'cutting edge technology.' In addition, the document has also promised that new policies will 'encourage the Ordnance Factory Board (OFB), Defence Public Sector Undertakings (DPSUs), and the private sector to strengthen their R&D wings so that constant up-gradation and improvement in systems under manufacture is possible.'

Weaknesses of DPrP

The positive features and intentions of the first ever DPrP notwithstanding, the document, however, suffers from a certain inherent weakness. The first weakness of the policy document lies in its ambitious goal of self-reliance, and that too in a 'substantive' manner in respect of design, development, and production. The document does not mention the specific area in whcih self-reliance is to be achieved over a period of time. This ambitious goal of self-reliance does not quite match with India's overall technological strength, and particularly with its R&D efforts. In terms of overall technology, India is way behind the advanced countries, particularly the USA, the UK, France, and Russia. In contrast to these countries—which spend over 10 per cent of their defence budget on R&D—India's total defence R&D spend as accounted for by the DRDO (the premier R&D organisation under the MOD), amounts to only six per cent. In absolute terms, DRDO's budget, which is presently around $2.2 billion, is far less than the R&D budget of the advanced counties. The Indian private sector, which is very keen to participate in the defence industry, also does not

spend much on R&D. Given that R&D constitutes the core of the defence industry, the self-reliance target of India would remain under pressure unless heavy investment is made on key technologies. The DPrP remains silent on this aspect.

As regards R&D, the DPrP is also not clear about how to promote research activities within the industry. Presently, the R&D spend by the industry is meagre, both in the public and private sector. In the public sector, except for a few DPSUs—particularly the Hindustan Aeronautics Ltd (HAL) and Bharat Electronics Ltd (BEL), which have a decent in-house R&D set up—no other public sector enterprise is serious about in-house design and development. It would have been much more effective if the DPrP mandated that these enterprises spend a certain portion of their revenue or profit on R&D.

Promoting R&D in the private enterprises is even more complex since the government cannot dictate them to spend a certain portion of their revenue/profit on R&D. Moreover, if the government decides to fund their R&D efforts, the difficulties of identifying the companies for such funding as also working out the detailed mechanisms for funding, still remain. This is mainly because the government has no formal record of private companies who are engaged in defence production. In this context, the selection of companies for R&D funding is a tough task as is quite evident from the process of designating very few Champions in Private companies, forcing the government to go slow on the process.

Lack of Level Playing Field to Private Sector

Although the DPrP has declared its intentions of 'proactively engaging the larger involvement of the Indian private sector in design, development, and manufacture of defence equipment', the statement is not backed by ground realities. At present, the private sector faces many problems in becoming a system integrator like its public sector counterparts. Unlike the DPSUs or the OFs, which are domestic leaders in their respective domain areas, the private sector is still seeking its own sphere of influence. Even the most serious effort to designate some private sector companies as Raksha Udyog Ratnas (RURs) or Champions have met with difficulty. The idea behind the RUR was to treat certain private enterprises at par with public sector undertakings, in order to facilitate the production of major defence items. In the

absence of this, the private sector is forced to play second fiddle to public sector enterprises which end up bagging big defence contracts on a nomination basis. It is critical, therefore, to identify key private sector companies in select areas of defence production, and nurture them over a period of time. For this, the MoD needs to announce the list of RURs at the earliest.

Cosmetic Emphasis on QRs

Although the DPrP has emphasised that the QRs be feasible with respect to domestic defence industrial capabilities, it does not lay down the specific mechanism for such efforts. Unlike in other counties where QRs are prepared by an integrated, professional agency, in India the task is performed by the individual SHQs whose officers often lack the necessary training or expertise for undertaking such a task. The QRs prepared by the SHQs are often found to be unrealistic vis-à-vis the capability of the domestic industry, leading to the import of all types of major systems from foreign OEMs. This has been clearly pointed out by the CAG which undertook a performance study of army capital acquisitions. Recently, while deposing before the Parliamentary Standing Committee on Defence, the defence secretary also pointed out that this happens because there is no institutional mechanism of consulting the industry at the time of the preparation of QRs. While the DPrP has mentioned—although passively—that the SHQ will undertake due diligence for this, it is not clear how such diligence would come about. As the best international practice in QR formulation shows, due diligence comes only when a professional body is entrusted with the task—a professional body which could closely work with the industry to identify the most cost-effective domestic solutions to the requirements of the armed forces.

Lack of Mechanism to Monitoring Self-Reliance in Defence Production

The DPrP had announced that the defence minister will 'hold an annual review of the progress in self reliance that has been achieved during the year.' However, nearly two years after the policy was announced, not a single review meeting has taken place so far.[19] Moreover, in the

[19] Amit Cowshish, 'Defence Production Policy: Need for Reinvigoration', *IDSA Comment,* October 25, 2012

present scheme of things, there is no institutional mechanism to enable the defence minister to review the progress. As discussed in Chapter II, the existing format of the defence ministry's budget does not provide a clear indication of the domestic share in the overall procurement budget. The procurement data is given under numerous procurement sub-heads, and each sub-head is sketchy regarding the precise level of the indigenous contribution. Thus, to facilitate the review of the progress of self-reliance, a prerequisite would be to have separate heads for procurement from domestic sources.

4.7 Joint Venture Guidelines

Nearly a year after the enunciation of DPrP, the MoD notified guidelines for the establishing of joint venture (JV) companies by DPSUs with companies in India and abroad. The policy initiatives, effective from February 17, 2012 came nearly two months after the MoD 'put on hold' the first ever JV formed between the Mazagon Dock Ltd. (MDL), a DPSU, and Pipavav shipyard, a private Indian company. The guidelines deal with a number of issues including: first, the need for setting up a JV; second, the protection of interests of DPSUs; third, fair and transparent procedures for the formation of the JV; and fourth, exit provisions. The objective of the new policy is to harness the 'emerging dynamism of the private sector' and exploit the 'increasing opportunity to obtain advanced technologies from foreign sources' in order to 'augment the national effort of producing defence products' within globally-competitive price lines and timelines.

The intention of the JV guidelines notwithstanding, the policy document suffers from certain weaknesses which may negatively impact the objective of enhancing national defence industrial capability. First, the policy document's major emphasis is on legalising and institutionalising the outsourcing of the existing orders of the DPSUs to the private sector or to foreign companies to facilitate early execution of the contract. Suffice it to say that the policy document makes no mention of the JVs competing for orders on their own strength. It must be noted that the DPSUs, particularly HAL and MDL, have accumulated a disproportionate number of orders which are beyond their capacity to deliver within the stipulated schedule. The guidelines can now be used as a means to expedite the work which the DPSUs are supposed to do on their own, but are constrained due to their inherent weaknesses

It is also important to note that the bulk of the existing contracts of the DPSUs have been awarded to them on a non-competitive (or on a nomination) basis, with scant regard for competitiveness. This has been done in order to protect their commercial interests. The faster execution of contracts by a JV selected through a fair and transparent process does not necessarily translate into efficiency of execution, given the inherent inefficiencies of the DPSUs. Even if the JV is successful in executing the contracts, it can be used by the DPSUs—or the administrative head in the MoD (that is, the DDP)—to lobby for more defence contracts on a nomination basis. Suffice to say that the nomination approach has often been a major point of discord between the DDP and the other stakeholders. If the nomination process continues and becomes institutionalised for eternity, the participation of the Indian private sector, whose participation in defence production is otherwise being encouraged including for system integration, will remain merely at the level of policy rather than practice.

Secondly, the JV Guidelines are in direct conflict with the existing defence FDI policy as far as partnerships with foreign companies are concerned. There are two reasons for this conflicting situation. The first is the cap on FDI inflows into the Indian defence industry. The current limit, which is pegged at 26 per cent, has dissuaded many foreign companies to part with sensitive technology to an Indian company over which it has little control. This has been the major reason why, after over a decade of the opening up of the defence production to international companies, very little FDI has come into Indian defence industry. The situation cannot be expected to change merely by JV Guidelines without a corresponding change in the FDI cap.

The second is the existing FDI limit also caps the amount a DPSU can invest in a particular JV. As per the current guidelines, DPSUs are not permitted to invest more than 15 per cent of their net worth on a particular JV. The 15 per cent investment freedom is also limited to Rs 1,000 crores in the case of the Navratna companies (such as HAL and BEL among the DPSUs), and Rs 500 crores for Mini-ratna companies (such as Bharat Dynamics Ltd. (BDL), BEML, Garden Reach Shipbuilders and Engineers Ltd. (GRSE), Goa Shipyard Ltd. (GSL), MDL, and Mishra Dhatu Nigam Ltd. (MIDHANI), among the remaining DPSUs). Under these restrictions, the JV that can be formed will be small—at least in terms of capital worth. For example, the net

worth of MDL, the biggest defence shipyard in India, is Rs 1,140.02 crores (2010–11). Assuming that MDL wants to invest 74 per cent in the equity of a JV by using the entire 15 per cent of its net worth, its financial contribution would amount to Rs. 171 crore; the JV would be valued at Rs. 231 crore, and the foreign partner's contribution of 26 per cent would be Rs. 60 crore. Such a small JV, would be unable to execute huge contracts that the MDL has been awarded in a time-bound manner.

Table 4.7: Net Worth of DPSUs, 2010-11

DPSU	Net Worth (Rs in Crores)	Limit of Investment on JV (Rs in Crores)
HAL	7851.8	1177.8
BEL	4985.7	747.9
BDL	551.9	82.8
BEML	2139.0	320.9
MIDHANI	298.9	44.8
MDL	1140.0	171.0
GRSE	679.3	101.9
GSL	569.1	85.4
HSL	-628.1	-94.2

Source: Annual reports of the respective DPSUs

Thirdly, the policy document is ambitious but at the same time, self-contradictory when it comes to protecting the interests of the DPSUs. The Guidelines maintain that while forming a partnership with other entities, the DPSUs are required to retain their 'independent ability and commitment' to meet the requirements of the armed forces. It is not clear why a DPSU would form a partnership if it has to develop the complementarities it seeks on its own. Instead of looking for a partner, it would be logical on the part of the DPSU to invest in acquiring the complementarities which it lacks. From the partner's point of view, if the DPSUs are required to maintain the same capabilities that the JV is supposed to have, then there is a likelihood that concerned DPSU may

be competing with its own JV partner for future contracts. This fear would lead to a situation in which the partner would be expected to behave in a manner unlike that expected from a strategic partner.

Lastly, the guidelines, in their present scope, do not include the OFs to enable them exploit the same benefits that are extended to the DPSUs. It is a fact that the OFs also need partnerships as much as their DPSU counterparts for the execution of contracts in a time-bound manner. It has been the perennial complaint of the armed forces that the OFs are unable to fulfil their demands in the required time frame. Moreover, the OFs need to form partnerships with foreign companies not only to produce quality products but to break into the export market. In the past, for this very reason some attempts had been made by the OFs to form partnerships with Israeli companies. Given this scenario, it is only logical that the JV guidelines should be extended to the OFs as well.

Chapter V

Self-Reliance
Agenda for Change

Self-reliance in defence production has been an avowed objective of Indian policy makers, which led to the creation of a vast industrial base. However, as discussed in the previous chapters, the Indian defence industrial base (DIB) is way short of meeting the self-reliance target. Apart from direct imports, which run into billions of dollars each year, an equally vast sum of money is spent every year for the purchase of parts, components, and raw materials from foreign sources by the state-owned enterprises. Although various committees have been set up to recommend measures for enhancing self-reliance, but either there has been a delay in implementation or they have not been implemented in letter and sprit. The key reforms that the Indian government needs to undertake in a time-bound manner, to give a fillip to this vital sector are discussed below:

Institutional Mechanism for Self-Reliance

A fundamental weakness of India's tryst with self-reliance has been the absence of a strong overarching institutional mechanism for setting out policy goals; bringing stakeholders (including the users, the R&D agencies and the industry) on board a common platform; monitoring the progress of indigenous projects; and fixing accountability. Both the Group of Ministers (GoM) and the Rama Rao Committee (RRC) have highlighted this gap and recommended the creation of such an institution. It is over a decade since the GoM first made this recommendation, but the government is yet to establish such an institution, although the Defence Technology Commission (DTC)is currently in the process of being established. Given that the purpose of the DTC is to bridge the age-old gaps in the Indian defence production set up, it needs to be implemented on a priority basis.

Redefining the Role of the Department of Defence Production

In the existing setup, the role of the department of defence production is confined to state-owned enterprises although its area of interest, as

mandated in the amended *Allocation of Business Rules* of the government of India, encompasses the entire defence industry, including the private sector. The DDP's role is limited because of an administrative system in which the officials manage the DPSUs and OFs, with senior officials being on their governing boards. There is not a single designated official in charge of the private sector. This has led to a conflict of interest wherein the DDP is often accused of protecting government-owned enterprises—much to the annoyance of the private sector which is getting increasingly frustrated by the lack of a level playing field vis-à-vis the DPSUs and the OFs. This frustration has grown over the years, and has manifested itself in a demand for shifting the administrative responsibility of the entire defence industry to the Prime Minister's Office which is perceived as having successfully managed the space and atomic energy sectors. Given that the private sector has a vital role in defence production, the existing setup of the DDP needs to be revamped. Among other changes, it needs to have a set of dedicated officials headed by one additional secretary, to ensure constant interaction with the private sector.

Articulation of Defence Industrial Policy

Despite a vast industrial base and two centuries of arms production, India still lacks a comprehensive defence industrial strategy paper. Although the Defence Production Guidelines (announced in January 2011) were a brave effort by the MOD they lack the critical punch. Among other shortcomings, the document does not specify the capabilities the Indian industry should possess to fulfil India's long-term industrial requirements. In the absence of any clear-cut guidelines uncertainty within the domestic industry will continue, and deter it from investing in desired areas. It is, therefore, imperative that a comprehensive policy that takes into account this crucial aspect be announced at the earliest.

Sharing Long-term Acquisition Plans with Industry

The MOD withdrew the public version of armed forces' technology and capability plan soon after it was put on its website. This was one of the most regressive steps taken by the MoD in recent years. The document had been uploaded in response to the longstanding demands arising from various quarters, including the industry and government committees. The document was intended to provide advance

information to Indian enterprises, and to 'encourage them to put forth firm proposals for participating in the self reliance process in terms of R&D, financial, production and product support commitments.' Since the DPP-2011 has mandated its requirements, an amended version of the document should be put in the public domain at the earliest.

Revitalising the State-owned Enterprises

Despite some deficiencies, the DPSUs and OFs have built huge empires over the years, with their production and sales running into several thousands of crores of rupees per year. Thus, it is necessary to strengthen this vital segment of India's domestic industry. The Kelkar Committee Report (Part-II) on *Revitalising Defence Public Sector Undertakings and Ordnance Factories* had suggested *inter alia* (a) the corporatisation of OFs; and (b) greater autonomy for the DPSUs so as to enable them to invest in, and integrate with, the global defence industry, and in turn benefit from foreign technology and international best practices. It is high time that the above recommendations are implemented without further delay.

DARPA-Like Body for Radical Innovation

As has been pointed out by several committees, there is a need to look beyond the existing R&D set up to promote innovation in defence. This need arises due to the inertia of existing organisations who do not focus beyond the military solutions of immediate needs. A DARPA-like structure with operational flexibility and the ability to attract the best human resources to conduct research in a bureaucracy-free environment, in mission mode, in the best possible laboratories, could go a long way in fostering innovation for 'tomorrow's needs', as has been achieved in the US context. Realising the merit of having such an organisation, the RRC had gone to the extent of the designating such a structure—the Board of Research in Advanced Defence Sciences (BRADS)—to replace the existing grant-in-aid system followed by the DRDO. With members drawn from different disciplines (from both within and outside DRDO), BRADS was to perform four critical tasks: promote post-doctoral scholarships; fund R&D institutes of higher excellence; promote innovation in small and medium enterprises; and, promote an intellectual property (IP) culture. The RRC had also suggested enhancing the financial commitment for this to at least 10

per cent of the DRDO's budget on innovative programmes, as opposed to the five per cent that the MoD has agreed to spend on extramural research. Given that DARPA has been highly successful in promoting radical innovation, and is found to be suitable for the Indian context, the RRC's recommendation in this respect needs to be implemented.

Synergy among Stakeholders

One of the stumbling blocks in India's self-reliance efforts has been the lack of synergy between the R&D agency, the industry, and the users. This has been pointed out by the RRC in the context of some of the major projects undertaken by the DRDO, where the lack of user participation in developmental projects, and the delay in identification of the production agencies, has led to delays and uncertainty. To establish such synergy, the RRC has recommended that the DRDO structures be reformed; a Services Interaction Group (SIG) be set up, and a Chief Controller, Research and Development (CCR&D) be appointed to coordinate with industry. These vital recommendations have, however, been diluted in the reform measures taken by the government. The SIG, which as per recommendations should have been headed by a three star general from the armed forces, is now being headed by a DRDO scientist. The CCR&D (Production Coordination) post is yet to be established. In view of the merits of user participation and early selection of production agencies, the above recommendations of the RRC need to be implemented in true letter and spirit.

FDI in Defence Industry

It is more than a decade since India's defence industry was thrown open to foreign participation, in the hope that the inflow of foreign capital and technology would promote domestic defence production. However, statistics show that neither capital nor technology of any significance has come into the Indian defence production sector. The lukewarm response of foreign investors is primarily due to the restrictive provisions in the policy. Foreign investors have so far been reluctant to invest in an Indian enterprise in view of the limited financial incentive and managerial control. Although suggestions have been made for raising the FDI cap to 49 per cent and beyond, there is no consensus on the precise figure.

The MoD, the key stakeholder of the FDI in defence industry, maintains that a maximum 49 per cent FDI can be allowed on a case by case basis. This not only creates uncertainty among potential investors but also negates many of its other policies/provisions, such as offsets, and 'Buy and Make (Indian)' categories - the success of which depends upon the liberal inflow of FDI. Since the basic rationale of FDI is to leverage foreign capital and technology for enhancing domestic capability, the ideal policy should have the flexibility to allow FDI up to 100 per cent (if it is in the national interest), or reject it completely if it is found unsuitable. The existing regulatory mechanism in the form of the FIPB could be empowered to decide the extent to which a particular investment can be allowed, subject to a wider security review and the potential impact on the local industry.

Industrial Licencing

The existing licencing policy for private sector participation is full of ambiguities. For example, it does not define what constitutes a defence item for which the private sector company is required to obtain a licence. The licencing regime is also not predictable, as the time taken to grant an industrial licence often takes much longer than required under the policy framework. This in turn raises the vital question as to whether the licencing regime furthers the cause of private sector's participation in defence production. Given the monopolistic nature of defence market in which the buyer is primarily the government, the market mechanism should be allowed to determine who wants to manufacture what. This does not, however, mean the complete elimination of government's responsibility for regulating this vital industry for the purpose of various policy incentives. However, this can be done in a liberal market by mandating that companies keep the government informed about their production and other related matters in the same way as is required for the deregulated sector.

Raksha Udyog Ratnas (RUR)

It is more than six years since the MoD issued the RUR guidelines to identify a select number of private enterprises which can be tasked to play a large role in defence production, including in the design and development of 'high technology complex systems'. Although a committee was set up to identify the companies which can be accredited

as RURs, the government is yet to announce their names—apparently due to the pressure from labour unions associated with state-owned enterprises. The delay in the identification of RURs has, however, demoralised the private sector whose frustration is increasing as they see themselves being marginalised. In view of the fact that the RURs were intended to be treated on par with existing state-owned enterprises, and for breaking the monopoly of existing DPSUs and OFs, this policy needs to be implemented.

Offsets

Since the formal announcement of an offset policy in 2005, it has undergone four rounds of revision, with latest being carried out in August 2012. The revised policy, for the first time, articulates key objectives, besides adding some new features and modifying/clarifying some of the earlier provisions. The revised policy for the first time also includes multipliers up to three to incentivise investment in MSMEs, and facilitate technology acquisition (from a select list) by the DRDO. Further incentives have also been provided by allowing the transfer of technologies and equipments as valid modes of offset discharge, extending the banking period to seven years, and expanding the avenues and list of eligible product/services for the discharge of offset obligations. A degree of flexibility has also been provided to foreign vendors by extending the period of the execution of offset contracts by two years, beyond the period of the main procurement contract. The monitoring and supervision of offset programmes has been strengthened by establishing a Defence Offset Monitoring Wing (DOMW)—which will replace the existing Defence Offset Facilitation Agency (DOFA) and have more powers—and mandating the new organisation to report to the Defence Minister-headed Defence Acquisition Council (DAC) each year about the progress of such programmes.

The above features notwithstanding, some of the provisions in the new policy do not seem to be well thought through. Among others, they offer greater leeway to foreign companies, and little incentive to domestic manufacturing sector, particularly defence manufacturing. Mandating offsets on Indian companies—if the products have less than 50 per cent indigenous content—and limiting the time frame to achieve the required indigenisation level before production starts, does

not seem to be realistic. This will dissuade many Indian defence manufacturers from competing against their global peers, even if they are hopeful of achieving progressive indigenisation over a period of time.

The manufacturing sector has been further marginalised by two provisions: first, the explicit exclusion of services from the purpose of value addition in India; and second, the clarification of MoD's position on IL and FDI. The first provision means that there is virtually no incentive for foreign companies to choose an IOP of a manufacturing background, since choosing an IOP from the services sector will be far more cost-effective. The second provision allows the foreign vendor's cost-effectiveness to be much more if it chooses a non-defence, non-manufacturing IOP that does not requires an IL, and is not subject to the 26 per cent FDI limit, which is mandated for Indian defence manufacturing enterprises. This means that the foreign vendor can set up a 100 per cent-owned subsidiary (specialising in services) in India, and choose it as its offset partner. As is evident, this does not benefit India's manufacturing sector at all, and certainly does not benefit its defence manufacturing.

The revised offset guidelines might have been innovative in allowing ToT/ToE for the discharge of offsets; but they are not clear at what stage the vendors are allowed to claim credits for such a transfer. The difference in interpretation by the vendor and the defence ministry could lead to long-drawn arbitration, and an unnecessary waste of time and money on both sides.

Although the provision for a stronger monitoring agency in the form of DOMW is definitely a step in the right direction, the new organisation's ability to monitor/audit offset programmes remains doubtful without a considerable increase of manpower.

Keeping the above in view, the following are recommended to address the key shortcomings of new offset guidelines.

- The indigenisation requirement for Indian companies under the offset purview should be kept at 30 per cent (as against 50 per cent as stipulated in the revised DOG) so as allow more Indian companies to compete for MoD's global contracts. The timeframe

to achieve the indigenisation level should also be extended beyond the time of submission of technical bids in order to allow domestic industry to progressively use more and more indigenous components in their final product.

- A uniform value addition principle should be applicable for both manufacturing and services sectors, so as to give equal opportunity to companies in these sectors and avoid potential manipulation by foreign vendors.

- It is high time that the industrial licencing (IL) and foreign direct investment (FDI) regulations were liberalised, so as to allow defence manufacturing to take advantage of the revised offset guidelines.

- The MoD should clarify at which stage foreign vendors can claim offset credits vis-à-vis transfer of technology and equipment.

- The newly created DOMW should develop a strong in-house capacity to discharge its responsibilities.

Mandatory Indigenisation Requirement under the 'Buy and Make' Category

Licence production has always been a key feature of India's defence industrialisation process, with major projects such Su-30 MKI, AJT Hawk, the Scorpene submarine, and the T-90 MBT being presently undertaken by the state-owned enterprises. This approach does not seem to have enhanced India's self-reliance, since the concerned enterprises have been unable to indigenise the parts, components, and raw materials, which are being imported on a large scale. This not only puts a question mark on the capability of the Indian defence industry but also defies the very logic of self-reliance. One of the reasons why DPSUs and OFs are overwhelmingly dependent on foreign sources for their production is due to the lack of accountability in ensuring a degree of indigenisation for the projects awarded to them under the 'Buy and Make' category. Unlike the indigenisation requirement under 'Buy Indian', 'Buy and Make (Indian)' and 'Make' categories, there is no such requirement for production under licence even though 100 per cent indigenisation is expected to be achieved by the time the production matures. Since the absence of this mandatory requirement

is not only discriminatory but also dilutes accountability, it is desirable that a suitable indigenisation requirement be mandated under the 'Buy and Make' category.

Data on Self-Reliance

Last but not the least, the MoD needs to create a data bank to facilitate the estimation of self-reliance in defence procurement. This assumes significance in view of the annual review to be undertaken by the defence minister in accordance with the Defence Production Policy. It is quite inconceivable that a country which has professed self-reliance so early in its defence industrialisation does not have a system to objectively estimate the index. The Defence Services Estimates (DSE) which provides data on numerous heads of expenditure does not presently provide information on the source of procurement. The document should be suitably modified to reflect information on the procurement from indigenous sources as well as imports and indirect imports. This will not only facilitate estimation of the self-reliance index in a more objective manner but will also facilitate monitoring its progress.

Annexure I

State-wise Distribution of Ordnance Factories, their Major Products and Value of Sales

Sl No	Factory/ Location	Major Product (s)	Value of supplies for 2010-11 (Rs in Crores)*
	ANDHRA PRADESH		
1	Ordnance Factory, Medak	Infantry Combat Vehicle	405.18
	BIHAR		
2	Ordnance Factory, Nalanda, Bihar	Propellant Bi-modular charges System.	Production of the unit is yet to start
	CHANDIGARH		
3	Ordnance Cable Factory, Chandigarh	Cables of various types.	10.87
	MAHARASHTRA		
4	Ammunition Factory, Kirkee, Pune	Small Arms ammunition	783.84
5	High Explosive Factory, Pune	Explosives, Initiatory Explosives, Acids and Chemicals etc.	86.57
6	Ordnance Factory, Chandrapur	Tank Gun Ammunition and Mortar ammunition	1251.60
7	Ordnance Factory, Varangaon	Small Arms ammunition	346.95
8	Ordnance Factory, Bhandara	Propellants and Commercial Explosives	35.17
9	Ordnance Factory, Dehu Road	Various Pyrotechnic compositions	238.28
10	Ordnance Factory, Ambajhari	Ammunition hardware for various ammunitions	2.14

Sl No	Factory/ Location	Major Product (s)	Value of supplies for 2010-11 (Rs in Crores)*
11	Ordnance Factory, Ambarnath	Brass and Guilding Metal cups of various Calibre for small arms and other ammunition	48.83
12	Machine Tool Prototype Factory, Ambarnath	Design, development and manufacture of special purpose machine tools and equipment, components and sub-assemblies for A&B vehicles.	38.17
13	Ordnance Factory, Bhusawal	Drums, Barrels, Ammunition boxes	0.31
		MADHYA PRADESH	
14	Ordnance Factory, Khamaria, Jabalpur	Small arms ammunition, anti aircraft ammunition, Heavy caliber anti tank ammunition, bombs, mines, ammunitions for Airforce and Navy.	1119.87
15	Ordnance Factory, Itarsi	Propellants of various types, Acid, Sulphuric Acid, Picrite etc	3.75
16	Ordnance Factory, Katni	Non-Ferrous Rolled and Extruded sections, cups for small arms ammunitions, Heavy caliber cartridge cases	0.17
16	Ordnance Factory, Katni	Non-Ferrous Rolled and Extruded sections, cups for small arms ammunitions, Heavy caliber cartridge cases	0.17
17	Gun Carriage Factory, Jabalpur	Carriages for Artillery Guns, Tank Gun Recoil System, Anti aircraft Gun, Mortars	233.64
18	Vehicle Factory Jabalpur	Army Transport vehicles	1388.25
19	Grey Iron Foundry, Jabalpur	Automobile casting of Grey and Malleable Iron	0

Sl No	Factory/ Location	Major Product (s)	Value of supplies for 2010-11 (Rs in Crores)*
		ODISHA	
20	Ordnance Factory, Badmal, Bolangir	Tank Gun and Artillery ammunition	760.73
		TAMIL NADU	
21	Heavy Alloy Penetrator Project, Tiruchirapalli	Empty Shots for Kinetic Energy ammunition	2.47
22	Ordnance Factory, Trichy, Tiruchirapalli	Small Arms	122.20
23	Heavy Vehicle Factory, Avadi	Tanks	2460.39
24	Engine Factory, Avadi	Engines for Battle Tanks and ICV	115.69
25	Ordnance Clothing Factory, Avadi	All Combat Clothing and Parade Garments, Parachutes	122.07
26	Cordite Factory, Aruvankadu	Propellant of various types	11.24
		UTTARAKHAND	
27	Ordnance Factory, Dehradun	Sighting and Fire Control instruments for tanks, Fire Control instruments for Guns and Mortars, Binoculars	47.33
28	Opto Electronic Factory, Dehradun	Precision Opto Mechanical/ Electronic Instruments for sighting and fire control for A vehicles.	110.53
		UTTAR PRADESH	
29	Ordnance Factory, Muradnagar	Plain Carbon and alloy steel castings for Tanks, ammunitions, Stell forgings	0.02
30	Ordnance Factory, Kanpur	Medium & High calibre guns, Shell empties	18.40
31	Small Arms Factory, Kanpur	Small Arms	176.10

Sl No	Factory/ Location	Major Product (s)	Value of supplies for 2010-11 (Rs in Crores)*
32	Field Gun Factory, Kanpur	High Calibre Ordnance & Spare Barrels, .32" Revolver	78.20
33	Ordnance Equipment Factory, Kanpur	Leather items, textile items, engineering equipments including mountaineering items	270.06
34	Ordnance Parachute Factory, Kanpur	Parachutes of different types	96.03
35	Ordnance Clothing Factory, Shahjahanpur	All Combat Clothing, Textile and Tentage items	199.06
35	Ordnance Clothing Factory, Shahjahanpur	All Combat Clothing, Textile and Tentage items	199.06
36	Ordnance Equipment Factory, Hazratpur	Tents & other dothing items	66.00
37	Ordnance Factory, Korwa	For production of carbines	At project stage
		WEST BENGAL	
38	Gun & Shell Factory, Cossipore	Medium Calibre Guns, Shells & Fuzes, pistols and Rocket Launcher	259.14
39	Rifle Factory, Ishapore	Small Arms	269.78
40	Metal and Steel Factory, Ishapore	Various Ferrous and non-ferrous castings & extrusions, Light/ Medium/Heavy Steel Forgings including Gun Barrel Forgings	32.24
41	Ordnance Factory, Dum Dum	Various Precision Machined and Fabricated items for Defence Forces	2.97

* The value of supplies represents direct issues made to Defence and non-defence customers and does not include supplies made from one factory to other factories. There are a number of factories which are feeder factories to other factories from where final product is issued to the customer.

Annexure II

Value of Production, Sales and Profit after Tax of DPSUs

Value of Production

Rs in Crore

	HAL	BEL	BEML	MDL	GRSE	GSL	HSL*	BDL	MIDHANI
2002-03	3477.84	2536.39	1740.16	539.52	523.09	232.14	..	330.38	93.50
2003-04	3756.14	2807.83	1691.87	495.77	486.90	200.83	..	522.47	116.42
2004-05	4984.55	3234.97	1885.95	540.63	470.28	141.83	..	465.79	141.67
2005-06	5916.62	3450.03	2179.57	518.37	662.18	249.78	..	534.28	177.60
2006-07	9201.88	4012.75	2590.75	1872.24	641.66	267.07	..	385.84	223.88
2007-08	8791.52	4111.37	2826.95	2321.69	573.47	317.21	425.88	505.85	296.40
2008-09	11810.85	5273.27	3294.19	2568.93	672.69	508.01	460.13	523.06	364.03
2009-10	13489.59	5247.88	37399.2	2856.13	870.74	866.48	608.43	631.61	373.24
2010-11	16450.84	5520.80	3795.07	2611.41	1053.30	990.32	603.43	910.98	485.46
2011-12	12693.19	5793.58	4077.19	2523.69	1293.80	676.43	564.04	992.94	496.00

Note: *: HSL became a DPSU in February 2010

Value of Sales

Rs in Crore

	HAL	BEL	BEML	MDL	GRSE	GSL	HSL*	BDL	MIDHANI
2002-03	3120.42	2508.02	1681.17	569.27	153.69	386.5	151.00	277.72	91.35
2003-04	3799.78	2798.59	1765.75	191.00	390.77	296.92	119.15	524.80	125.13
2004-05	4533.80	32112.09	1856.01	99.54	881.41	83.49	225.30	450.98	131.27
2005-06	5341.50	3536.28	2205.84	164.29	985.99	106.96	243.58	531.53	152.89
2006-07	7783.61	3952.69	2601.79	18.68	713.74	152.79	327.63	433.51	192.50
2007-08	8625.33	4102.54	2713.34	6.06	556.65	26.94	384.52	454.38	255.01
2008-09	10373.38	4623.69	3.13.47	5.49	740.62	476.85	395.82	464.82	309.11
2009-10	11456.70	5219.77	3588.93	3150.94	424.27	472.89	618.96	627.23	371.21
2010-11	13115.50	5529.69	3647.07	636.56	546.22	514.43	652.14	939.16	417.67
2011-12	14204.21	5703.63	3648.37	2262.87	546.33	269.69	564.04	959.12	509.01

Note: *: HSL became a DPSU in February 2010

Profit after Tax

Rs in Crore

	HAL	BEL	BEML	MDL	GRSE	GSL	HSL*	BDL	MIDHANI
2002-03	389.96	260.61	26.10	-24.13	21.33	17.83	2.46	64.53	-2.60
2003-04	409.79	316.10	24.17	7.92	29.30	31.88	-52.03	50.56	6.89
2004-05	501.06	446.32	175.28	69.14	27.52	9.92	-7.89	30.66	6.85
2005-06	771.14	583.01	186.93	60.1	65.33	16.72	6.19	76.72	12.03
2006-07	1148.76	718.16	204.93	168.08	120.14	40.69	300.93	32.74	23.19
2007-08	1631.88	826.74	225.65	240.86	74.47	69.97	11.33	47.65	35.54
2008-09	1739.86	745.76	268.84	270.73	51.65	81.96	-140.01	47.67	41.06
2009-10	1967.41	720.87	222.85	240.19	114.41	130.72	2.32	33.77	44.62
2010-11	2114.26	861.47	149.76	243.52	115.71	176.13	55.00	51.7	50.42
2011-12	2539.43	829.90	57.25	494.31	108.03	82.76	-85.98	234.96	68.45

Note: *: HSL became a DPSU in February 2010

Annexure III

Guidelines for Licensing Production of Arms & Ammunitions

In pursuance of the Government decision to allow private sector participation up to 100% in the defence industry sector with foreign direct investment (FDI) permissible up to 26%, both subject to licensing as notified vide Press Note No. 4 (2001 series), the following guidelines for licensing production of arms and ammunitions are hereby notified:

1. Licence applications will be considered and licences given by the Department of Industrial Policy & Promotion, Ministry of Commerce & Industry, in consultation with Ministry of Defence.

2. Cases involving FDI will be considered by the FIPB and licences given by the Department of Industrial Policy & Promotion in consultation with Ministry of Defence.

3. The applicant should be an Indian company / partnership firm.

4. The management of the applicant company / partnership should be in Indian hands with majority representation on the Board as well as the Chief Executive of the company / partnership firm being resident Indians.

5. Full particulars of the Directors and the Chief Executives should be furnished along with the applications.

6. The Government reserves the right to verify the antecedents of the foreign collaborators and domestic promoters including their financial standing and credentials in the world market. Preference would be given to original equipment manufacturers or design establishments, and companies having a good track record of past supplies to Armed Forces, Space and Atomic energy sectors and having an established R & D base.

7. There would be no minimum capitalization for the FDI. A proper assessment, however, needs to be done by the management of

the applicant company depending upon the product and the technology. The licensing authority would satisfy itself about the adequacy of the net worth of the foreign investor taking into account the category of weapons and equipment that are proposed to be manufactured.

8. There would be a three-year lock-in period for transfer of equity from one foreign investor to another foreign investor (including NRIs & OCBs with 60% or more NRI stake) and such transfer would be subject to prior approval of the FIPB and the Government.

9. The Ministry of Defence is not in a position to give purchase guarantee for products to be manufactured. However, the planned acquisition programme for such equipment and overall requirements would be made available to the extent possible.

10. The capacity norms for production will be provided in the licence based on the application as well as the recommendations of the Ministry of Defence, which will look into existing capacities of similar and allied products.

11. Import of equipment for pre-production activity including development of prototype by the applicant company would be permitted.

12. Adequate safety and security procedures would need to be put in place by the licensee once the licence is granted and production commences. These would be subject to verification by authorized Government agencies.

13. The standards and testing procedures for equipment to be produced under licence from foreign collaborators or from indigenous R & D will have to be provided by the licensee to the Government nominated quality assurance agency under appropriate confidentiality clause. The nominated quality assurance agency would inspect the finished product and would conduct surveillance and audit of the Quality Assurance Procedures of the licensee. Self-certification would be permitted by the Ministry of Defence on case to case basis, which may involve either individual items, or

group of items manufactured by the licensee. Such permission would be for a fixed period and subject to renewals.

14. Purchase preference and price preference may be given to the Public Sector organizations as per guidelines of the Department of Public Enterprises.

15. Arms and ammunition produced by the private manufacturers will be primarily sold to the Ministry of Defence. These items may also be sold to other Government entities under the control of the Ministry of Home Affairs and State Governments with the prior approval of the Ministry of Defence. No such item should be sold within the country to any other person or entity. The export of manufactured items would be subject to policy and guidelines as applicable to Ordnance Factories and Defence Public Sector Undertakings. Non-lethal items would be permitted for sale to persons / entities other than the Central or State Governments with the prior approval of the Ministry of Defence. Licensee would also need to institute a verifiable system of removal of all goods out of their factories. Violation of these provisions may lead to cancellation of the licence.

16. Government decision on applications to FIPB for FDI in defence industry sector will be normally communicated within a time frame of 10 weeks from the date of acknowledgement by the Secretariat for Industrial Assistance in the Department of Industrial Policy & Promotion.

(M.S. SRINIVASAN)

Joint Secretary to the Government of India

No. 5(37)/2001-FC I dated 4th January 2002

Annexure IV

KELKAR COMMITTEE RECOMMENDATIONS AND THEIR STATUS

Report (Part-I)

Sl No	Recommendations	Government Decision
1	Information sharing -creation of public version of Armed Forces Perspective Plans.	Accepted
2	Entry point for Private Sector – Defence Acquisition Amendment to (a) SCAPCC (b) SCAPCHC.	Accredited industry to be associated in the categorization process depending upon the item under consideration.
3	Limited consultation with industry where TOT for production or maintenance involved before finalizing RFP and in preparation of SQRs when the system matures.	Industry may be consulted both in "Buy" and "Buy & Make" category of cases Wherever there is ToT. No action need be taken at this stage for consulting industry in the preparation of SQRs.
4	Amendment to incorporate provision of servicing, maintenance and upgrade in Procurement Procedure for "Buy" Category.	Accepted. However, instead of maintenance ToT it should be maintenance infrastructure to be clearly stated in the RFP.
5	Amendment to Defence Production Board to include representation of CII and FICCI etc.	Amend the Constitution of DPB with the approval of Competent Authority to incorporate representation of Industry ("RUR"/"Champion") on a case-to-case basis. General representation of Industry Association not to be allowed.
6	Setting up of Committee for working out a scheme on the basis of DARPA model.	There must be a multi disciplinary task force to prepare the proposal and indicate fund requirement etc. and also how it should function. This task force should evolve a model for consideration of Government.

Sl No	Recommendations	Government Decision
7	Devising a mechanism to provide level playing field to private sector industry.	A proposal to provide level playing field between the Indian industry vis-à-vis foreign suppliers in the area of Defence Procurement is already under consideration of Committee of Secretaries. On the Issue of 'nomination' Apex Committee noted that DPSUs and OFs have been set up for specific purposes and full utilization of their installed capacities must be taken into account
8	Guidelines for Identification of RURs/Champions – Approval of Draft.	Accepted
9	Constitution of Committee for RUR identification.	Accepted
10	Draft agreement covering the Code of Best Practices to be followed by RURs.	Accepted
11	Creation of "Defence Technology Development Fund".	May be accepted in principle. A view may be taken with the approval of RM to have a provision in the Budget instead of creating separate Fund in view of the recent instructions of Ministry of Finance. Formulate guidelines/ modalities for operation/utilization of the Fund/Budget provision.
12	Budgetary Provision for R&D between DRDO, Defence Technology Development Fund and Service HQrs to be provided separately.	Accepted
13	Scheme for giving institutional support to SMEs for Defence supplies.	Accepted

Sl No	Recommendations	Government Decision
14	Guidelines/Code of Practice for prime contractor involvement in maximizing SMEs' participation in Defence contracts.	Accepted
15	Inclusion of representatives of CSIR and ISRO in Defence R&D Board.	They may be associated with the Defence R&D Board at macro level on case-to-case basis, wherever required.
16	Review of DRDO by independent committee – initiation.	Accepted
17	Manual for Defence Acquisition Procedure for "Make" Category.	Accepted
18	Constitution of a Committee to recommend restructuring of MOD on the lines of DGA of France.	Accepted
19	Taking up pilot projects to try modified approach for acquisition of items categorized as "Buy & Make".	Service HQs and DRDO would provide a list of such cases where they had already followed this procedure. A study of such cases as well as some new projects may then be undertaken to assess the practicability of the suggested modified procedure in order to see what improvements are needed therein. Thereafter, a final view may be taken on the recommendation.
20	DRDO to concentrate on high technology and offload R&D work as much as possible to industry;implementation of scheme for parallel development on the lines of DARPA through NCSIT	Since the issue relating to setting up of National Centre for Strategic Information Technology (NCSIT) is to be further discussed with NASSCOM, the recommendation for implementing DARPA through NCSIT may not be accepted. As far as DARPA itself is concerned, the matter has been dealt with in another recommendation.

Sl No	Recommendations	Government Decision
21	Upgrades of existing Platforms should be taken up by indigenous industry.	Accepted
22	Introduce a policy of 'Shared Development Costs' in 'Make' category.	Accepted
23	Accept principle of acquiring 'Minimum Order Quantity'.	Accepted
24	Placement of Fund – Service Headquarters for R&D work – Preparation of scheme.	Accepted
25	Suitable guidelines for project-wise allocations from within funds placed at the disposal of SHQ for R&D projects.	Accepted
26	Preparation of proposal for strengthening IDS.	Accepted
27	Introduction of the concept of assessing Life Cycle Cost in all Capital Acquisition Projects valued over Rs.300 crores.	Accepted
28	Internal Process Compliance arrangement to be strengthened.	Since the question of accountability and responsibility is involved, a final view may be taken in the Apex Committee.
29	Armed Forces to introduce outsourcing of Services to public and private sector and increase progressively.	Accepted
30	Develop Training Courses for (a) Tendering and Contracting and (b) Project Management.	Accepted
31	Allocating funds for providing fellowship for higher studies for serving Service Officer.	Accepted. Need for post-course utilization of such trained officers in service and necessity for establishing Centers of Excellence in the country by retaining such highly trained officers and creating a good faculty for long term benefits to be kept in view.

Sl No	Recommendations	Government Decision
32	Establishment of a National Defence University.	Accepted
33	Set up an Autonomous Body for Aerospace development with involvement of all stake holders	Requires greater deliberation. Modalities for setting up of the proposed Aerospace Body need to be worked out, considering its usefulness, composition and objectives.
34	Creation of National Centre for Strategic Information Technology. (Need for a separate procurement procedure for ICT items)	Requires greater clarity for consideration. It would be advisable to have further interaction with National Association of Software Service Companies (NASSCOM).
35	Need to review the whole concept of indigenization and self-reliance.	Accepted
36	Creation of the "Strategic Defence Industry Fund" (SDIF) – Non-Lapsable Pool	Recommendation only linked with "Make" projects. Requires further scrutiny by a Group of Officers for making it far more workable and acceptable.
37	Introduction of 'Offset' clause in RFPs for procurement under Capital & Revenue Budgets.	Accepted
38	(i) Maintain licensing regime; (ii) Constitute an Inter-Ministerial Committee; (iii) Free licensing for Africa, Latin America, North America, Europe, Australia; (iv) Export control regime on a case-to-case basis for Export to countries in India's strategic neighbourhood.	(i) & (ii) – may be accepted.(iii) & (iv) – approach should be based on case-to-case without any free licensing areas.

Sl No	Recommendations	Government Decision
39	(i) Consortium approach to international marketing; (ii) Encourage private/public sector participation in export marketing with consortium approach.(iii) Industry Associations to set up Export Houses in select countries.	Accepted
40	(i) Information on the line of credit facility should be made available to DDP from MEA; (ii) Encourage active involvement of the defence industry to promote defence products and services to beneficiary countries under the line of credit; (iii) Long-term engagement of the Defence industry in the recipient country – life cycle product support; (iv) Reimbursement of certain costs to facilitate exports.	Accepted

Source: Standing Committee on Defence (2008-09), 14th Lok Sabha, Indigenisation of Defence Production: Public-Private Partnership (New Delhi: Lok Sabha Secretariat, 2008), pp. 78-83.

Report (Part-II)

Sl No	Recommendations	Government Decision
1	The Committee recommends that HAL and BEL be accorded the status of Nav Ratna by relaxing the provisions of eligibility. BDL already has the status of Mini Ratna.	Nav Ratna status has been accorded to both BEL & HAL. Recommendation has been implemented.
2	The Committee also recommendsthat BEML and MDL be accorded the status of Mini Ratna by relaxing the provision of eligibility.	Mini Ratna-I has been accorded to MDL & BEML. Recommendation has been implemented.
3	The Committee also recommends that DPSUs like HAL should be listed for improved Corporate Governance and access to Capital markets.	HAL has got enough cash surplus with it and therefore does not need access to capital markets for funds. Hence, there is no need for listing of HAL at present. BEML & BEL have already been listed. No further action envisaged.
4	All Defence PSUs except MIDHANI should be given the freedom to do cross investment in foreign companies from whom they can obtain technology, which has remained out of their reach so far.	Any proposal for cross investment in foreign companies would be guided by the guidelines & powers given to Mini Ratna/Nav Ratna companies. Provision exists under the rules to implement the recommendation. Further action not required.
5	DPSUs should explore the possibilities of mergers and formation of consortia in order to achieve optimum level of synergy and become globally competitive.	BEL has started discussions with some DPSUs and has so far entered into MOU with HAL and OFB. GSL too has formed a consortium with other defence Shipyards to secure export orders. Provision exists under the rules to implement the recommendation. Further action not required.

Sl No	Recommendations	Government Decision
6	The Committee also suggests horizontal mobility between Ordnance Factory Corporation and DPSUs for confidence building.	As Government has not decided to corporatise Ordnance Factories, no further action envisaged on this recommendation.
7	There should also be synergy between DPSUs and Private Sector and formation of Joint Ventures should be encouraged. FDI upto 50% may be permitted for Joint Ventures between the two.	BEL & BEML have created subsidiaries, who in turn have JVs with foreign companies. GSL has entered into MOUs/agreements with a number of foreign and Indian companies. BEML has entered into a JV for contract mining. In it 26% equity is of one of the foreign firms. Recommendation regarding FDI up to 50% not to be implemented. No further action.
8	The QA agencies should confine their spheres of activities to essentially Quality Assurance work and functions like Vendor Development, Vendor Registration, Indigenisation, Product development, Capacity assessment of Vendors, Inspection of input material of all types should not be performed by them. These functions should be the responsibility of the Manufacturing Units. QA agencies should become professionally more competent and confine their functions to Quality Surveillance and process auditing apart from final inspection.	Vendor registration, their capacity assessment and inspection of input material already handed over to Ordnance Factories/DPSUs. Self certification by OFB of intermediate products issued by Ordnance Factories to sister factories as IFD item (Inter Factory Demand) is under examination of MOD. Alteration Committees have been set up to take up product development/ improvement. Indigenisation activities to have been handed over to the Services. The Quality Audit, Surveillance, Process Audit and Final Acceptance Checks are essential elements of QA functions and shall remain with QA agencies. Recommendation has been implemented.

Sl No	Recommendations	Government Decision
9	QA agencies should continue to give QA cover to imported items and the stores directly procured by the Army, Navy and the Air Force through their Depots and such Organisations like Base Workshop, Base Repair Depots and Dockyards.	The recommendation is agreed to by DGQA. Activities related to capacity assessment/registration as regards to procurement by MGO/ DGOS/Depot/ Naval procurement agencies, shall continue with DGQA, DGAQA, DQA(N), as the case may be. DGQA will continue providing QA coverage to imported items/stores. Recommendation has been implemented.
10	There is a need to radically review the role of AHSP's and redefine the concept, enabling the Manufacturer to take up improvement, upgradation more easily, but ensuring that form, fit and functionality are in complete conformity with the requirements as articulated by the Users viz. SHQs.	A statement of case on the 'Role and Function of DGQA' is under examination. The Role of AHSP will be aligned with the orders issued in this regard. Government has already issued orders for creation of Alteration Committee at OFs to facilitate product development, product improve-ment/upgradation. For naval stores, product improvement by OEM can be carried out only after consultation with Naval HQ, being AHSP. Recommendation under examination.
11	As other Defence PSUs, the three Shipyards should be allowed to develop vendors for ships being constructed by them and also for life long maintenance services for these ships, as far as possible, for "ship construction activities only" and not for other equipment fitted on board. This would create the environment for growth and development for these Shipyards. The system of nomination of vendors should be discontinued as soon as possible.	Shipyards have been duly empowered vide Para V of MOD letter.16(2)/2004-D(QA) dated 20.12.2005 to develop vendors should be able to execute the functions in line with ISO 9000 guidelines and also be in position to be auditable by DGQA for its ability to build quality into the product during its realization. Indigenisation for Naval equipment has already been transferred to NHQ in January 2006. No further action required.

Sl No	Recommendations	Government Decision
12	For product development undertaken by DRDO there is need to involve the Industry, which will take up LSP (Limited Series Production) and BP (Bulk Production) from initial stages in vendor development. Ideally the Industry should do the vendor selection and development but this can be taken up gradually.	DROD involves industry during product development and for many complex products, industry is a major partner from the early stages of R&D and product development. The present procedure works well for initial delivery and for repeat order for relatively small numbers. For large volume of production, the infrastructure of these industries is not sufficient. DRDO is of the view that involvement of industry iseconomically sound and has several benefits. DRDO, therefore, reiterates that there should be "stake holdings" in establishing all private and public partnerships, in undertaking R&D leading to engineering development. DRDO is willing to assist the industry in funding in the ratio 70/30: 80/20. No further action required.
13	The Industry, both Public and Private and particularly the corporatized OFs must move towards a regime self-certification by first obtaining certification relating to international standards or satisfying the requirements enunciated by QA agencies in their guidelines (ideally it should be the same).	The Group of Officers in their report on "Improvement in the present system of Quality Assurance in the Ministry of Defence" has recommended that the production agencies in the Government sector such as DGOF, DPSUs should make concerted efforts to sell under self certification DGQA and DGAQA to it. In fact OFs have been granted selfcertification for few clothing items. BEL too has been granted selfcertification status for certain product ranges. No further action required.

Sl No	Recommendations	Government Decision
14	The DGQA and DGAQA must amend the rules to include provision for deputation from other scientific organizations, corporatized OFs, DPSUs to fulfil the gaps for areas requiring highly trained manpower in the field of higher technologies.	Acceptance of the recommendation necessitate amendment in Service Rules. Recommendation not implemented.
15	Ordnance factories should be corporatized into a single corporation under leadership of a competitive management. This corporation should be accorded the status of Nav Ratna.	Government has not decided to corporatise the Ordnance Factories and there is no intention to implement this recommendation at present. No further action envisaged.
16	Corporatisation of OFs could be on the lines of BSNL.	No further action envisaged.
17	The process of corporatisation would require lot of hand holding for the Ordnance Factories in order to address their sensitiveness and insecurities. As part of handholding process, the existing dispensations by the government to the Ordnance factories should continue to be given to Ordnance factories for a period of three years to help them steer the change process internally. The dispensations should be gradually tapered off during the three year period for the Ordnance Factory Corporation to be completely independent at the end of this time period.	No further action envisaged.

Sl No	Recommendations	**Government Decision**
18	Along with this financial support, Ordnance factories would also require training support not only to upgrade their skill sets but also adopt modern management practices.	RM has directed Ordnance Factories to focus on training of personnel in the modern management practices and latest technologies through reputed institutes of India and abroad. Recommendation has been implemented.
19	The Committee would also like to mention that corporatisation does not necessarily mean privatization.	No further action envisaged.

Annexure V

An Overview of DARPA

The Defence Advanced Research Project Agency (DARPA) is a premier research organisation under the US Department of Defence. It was set up in 1958 in response to Russia's launch of Sputnik, with the primary mission to prevent technological surprise to the US (over the years, the mission objective has been expanded to include technological surprise to the US adversaries). Since its formation, DARPA has undertaken pioneering research in numerous fields including the internet, GPS, BMD, stealth, high-energy lasers, robotics, and UAVs, which have revolutionized military technologies and the modern-day war fighting. The highly successful R&D mission of DAPRA has led to its replication by other US federal agencies, notably the Departments of Homeland Security, Energy, and Health and Human Services.

The principal charter of DARPA is 'radical innovation', rather than incremental invention. Unlike other R&D agencies under the DOD which focus on near-term technological solution, DARPA carrier out long-term R&D mission from the perspective of "what a military commander would want in the future." It does so by "sponsoring revolutionary, high pay-off research that bridges the gap between fundamental research and their military use."

The management structure of DARPA is unique in several ways. It is designed in such a way that facilitates early decision, induction of the best human resources, protecting them from red-tape, and empowering them.

What Makes DAPRA DARPA?

The 'innovation model' as represented by DARPA's has certain features that has made the agency highly successful. William B Bonvillian of MIT writing in *The American Interest* (November-December 2006), has listed the following 12 characteristics of DARPA:

1. *Small and flexible*: DARPA has only about 140 technical professionals; some have referred to DARPA as "100 geniuses connected by a travel agent."

2. *Flat organization*: DARPA avoids hierarchy, essentially operating at only two management levels to ensure the free and rapid flow of information and ideas, and rapid decision-making.

3. *Autonomy and freedom from bureaucratic impediments*: DARPA has an exemption from Title V civilian personnel specifications, which provides for a direct hiring authority to hire talent with the expediency not allowed by the standard civil service process.

4. *Eclectic, world-class technical staff and performers*: DARPA seeks great talent and ideas from industry, universities, government laboratories, and individuals, mixing disciplines and theoretical and experimental strengths. DARPA neither owns nor operates any laboratories or facilities, and the overwhelming majority of the research it sponsors is done in industry and universities. Very little of DARPA's research is performed at government labs.

5. *Teams and networks*: At its very best, DARPA creates and sustains great teams of researchers from different disciplines that collaborate and share in the teams' advances.

6. *Hiring continuity and change*: DARPA's technical staff is hired or assigned for four to six years. Like any strong organization, DARPA mixes experience and change. It retains a base of experienced experts – its Office Directors and support staff – who are knowledgeable about DoD. The staff is rotated to ensure fresh thinking and perspectives, and to have room to bring technical staff from new areas into DARPA. It also allows the program managers to be bold and not fear failure.

7. *Project-based assignments organized around a challenge model*: DARPA organizes a significant part of its portfolio around specific technology challenges. It foresees new innovation-based capabilities and then works back to the fundamental breakthroughs required to make them possible. Although individual projects typically last three to five years, major technological challenges may be addressed

over longer time periods, ensuring patient investment on a series of focused steps and keeping teams together for ongoing collaboration. Continued funding for DARPA projects is based on passing specific milestones, sometimes called "go/no-go's."

8. *Outsourced support personnel*: DARPA extensively leverages technical, contracting, and administrative services from other DoD agencies and branches of the military. This provides DARPA the flexibility to get into and out of an area without the burden of sustaining staff, while building cooperative alliances with its "agents." These outside agents help create a constituency in their respective organizations for adopting the technology.

9. *Outstanding program managers*: The best DARPA program managers have always been freewheeling zealots in pursuit of their goals. The Director's most important task is to recruit and hire very creative people with big ideas, and empower them.

10. *Acceptance of failure*: DARPA pursues breakthrough opportunities and is very tolerant of technical failure if the payoff from success will be great enough.

11. *Orientation to revolutionary breakthroughs in a connected approach*: DARPA historically has focused not on incremental but radical innovation. It emphasizes high-risk investment, moves from fundamental technological advances to prototyping, and then hands off the system development and production to the military services or the commercial sector.

12. *Mix of connected collaborators*: DARPA typically builds strong teams and networks of collaborators, bringing in a range of technical expertise and applicable disciplines, and involving university researchers and technology firms that are often not significant defense contractors or beltway consultants.

Annexure VI

Status of Implementation of Recommendations of Rama Rao Committee (As on May 2012)

The following have been implemented:

- Nomination of Nodal Officers for interaction between DRDO and Services
- Introduction of Integrated Financial Advice (IFA) system for financial decentralization
- A dedicated Chief Controller Research and Development (Human Resource) has already been appointed at DRDO HQrs.

The following recommendations are at various stages implementation

- Creation of technology domain-based cluster of laboratories
- Increase of allocation for extramural research to five per cent of DRDO budget
- Restructuring of DRDO HQrs.

The following are pending for Cabinet approval (as on October 2012) for implementation:

- Creation of Defence Technology Commission.
- Creation of a Commercial Arm of DRDO.
- Renaming of DG, DRDO as Chairman, DRDO.

Annexure VII

Difference in Interpretation of Ownership and Control of EADS-L&T JV

In 2009, EADS Deutschland GmbH of Germany & Larsen & Toubro Ltd of India has submitted a JV proposal in which FDI coming directly was below 26 per cent, but the remaining equity was being routed through another Services JV in which the EADS had 49 per cent stake. As the proposal was of defence sector, Foreign Investment Promotion Board (FIPB) considered it essential that letter and spirit as embodied in Press Note 2 of 2009 is strictly adhered to. The Board directed Department of Defence Production and DIPP to verify and confirm to FIPB that the 'control and ownership' of L&T in the two JVs namely, the manufacturing JV and the services JV is absolute and complete as per the Press Note 2 of 2009 and should remain so for ever.

DIPP supported the proposal subject to:

1. The shareholders/JV agreements incorporating the change that the Manufacturing JV would now have five directors, out of which one each will be nominated by EADS and L&T respectively. The remaining three directors will be nominated by the Services JV. Out of the three directors nominated by the Services JV, the power to nominate two directors would vest with L&T and the power to appoint one director would vest with EADS. As such, in effect, the Manufacturing JV would now have three directors nominated by L&T and two nominated by EADS.

2. The Articles of Association and the Memorandum of Understanding will incorporate the above.

3. The Services JV is 'owned and controlled' by resident Indian citizens and Indian companies, which are owned and controlled by resident Indian citizens, in terms of Press Note 2 of 2009. The power to 'legally direct the actions of the company' vests with resident Indian citizens and Indian companies, which are owned and controlled by resident Indian citizens, in terms of Press Note 2 of 2009.

4. The Manufacturing JV is also 'owned and controlled' by resident Indian citizens and Indian companies, which are owned and controlled by resident Indian citizens, in terms of Press Note 2 of 2009. The power to 'legally direct the actions of the company' vests with resident Indian citizens and Indian companies, which are owned and controlled by resident Indian citizens, in terms of Press Note 2 of 2009.

MoD did not support the proposal on the grounds that ownership pattern of the proposed JV is violation of the sectoral cap of 26 per cent in defence by adding a new dimension to the concept of ownership and control by maintaining that "ownership and control issues go beyond the Board Room in the day to day functioning of any company. The foreign partner in this case is bringing into the partnership the bargaining power, both of technology and investment, and it would not be easy for the Indian partner to carry forth its views in the day-to-day functioning of the company".

The FIPB had a difficult choice. Though technically it did not find fault with the applicant's proposal and the changes recommended by DIPP, yet, the proposal being the first case testing the Press Notes in a sensitive sector, it decided to honour the apprehensions of the administrative ministry and rejected the proposal.

Annexure VIII

List of Products and Services Eligible for Discharge of Offset Obligations

A. Defence products

1. Small arms, mortars, cannons, guns, howitzers, anti tank weapons and their ammunition including fuzes.
2. Bombs, torpedoes, rockets, missiles, other explosive devices and charges, related equipment and accessories specially designed for military use, equipment specially designed for handling, control, operation, jamming and detection.
3. Energetic materials, explosives, propellants and pyrotechnics.
4. Tracked and wheeled armoured vehicles, vehicles with ballistic protection designed for military applications, armoured or protective equipment.
5. Vessels of war, special naval systems, equipment and accessories to include following:
    i. Design, manufacture or upgrade of weapons, sensors, armaments, propulsion systems, machinery control systems, navigation equipment/instruments other marine equipment and hull forms of war ships, submarines, auxiliaries.
    ii. Facilities and equipment required for testing, certification, qualification and calibration of hull forms, platform, propulsion and machinery control systems, weapons sensors and related equipment including enhancement of stealth features and EMI/EMC studies for warships, submarines and auxiliaries.
    iii. Software specially designed, developed and modified for design of all types of warships, submarines and auxiliaries or their hull forms.
    iv. Setting up of maintenance and repair facility for equipment/ weapons and sensors and other marine systems including related technical civil works.

6. Aircraft, unmanned airborne vehicles, aero engines and air craft equipment, related equipment specially designed or modified for military use, parachutes and related equipment.

7. Electronics and communication equipment specially designed for military use such as electronic counter measure and counter counter measure equipment surveillance and monitoring, data processing and signalling, guidance and navigation equipment, imaging equipment and night vision devices, sensors.

8. Specialized equipment for military training or for simulating military scenarios, specially designed simulators for use of armaments and trainers and training aids viz. Simulators, associated equipment, software and computer based training modules.

9. Forgings, castings and other unfinished products which are specially designed for products for military applications and troop comfort equipment.

10. Miscellaneous equipment and materials designed for military applications, specially designed environmental test facilities and equipment for the certification, qualification, testing or production of the above products.

11. Software specially designed or modified for the development, production or use of above items. This includes software specially designed for modelling, simulation or evaluation of military weapon systems, modelling or simulating military operation scenarios and Command, Communications, Control, Computer and Intelligence (C4I) applications.

12. High velocity kinetic energy weapon systems and related equipment.

13. Direct energy weapon systems, related or countermeasure equipment, super conductive equipment and specially designed for components and accessories.

B. Products for inland/coastal security

1. Arms and their ammunition including all types of close quarter weapons.

2. Specialised Protective Equipment for Security personnel including body armour and helmets.

3. Vehicles for internal security purposes including armoured vehicles, bullet proof vehicles and mine protected vehicles.
4. Riot control equipment and protective as well as riot control vehicles.
5. Specialized equipment for surveillance including hand held devices and unmanned aerial vehicles.
6. Equipment and devices for night fighting capability including night vision devices.
7. Navigational and communications equipment including secure communications.
8. Specialized counter terrorism equipment and gear, assault platforms, detection devices, breaching gear etc.
9. Specialised equipment for Harbour Security and Coastal Defence including seabed/maritime surveillance sensor chains, sonars, radars, optical devices, AIS.
10. Vessel Traffic Management Systems (VTMS/VATMS) and appropriate vessels/crafts/boats.
11. Miscellaneous maritime equipment for undertaking investigations, Boarding, Search and Seizure of ships/vessels.
12. Software specially designed, developed and modified for all types of Coastal and Maritime security domain awareness, operations and data exchange.
13. Training Aids viz simulators, associated equipment, software and computer based training modules.

C. Civil aerospace products

1. Design, Development, Manufacture and Upgrade of all types of fixed wing and rotary wing aircraft or their airframes, aero engines, avionics, instruments and related components.
2. Composites, forgings and castings for the products.
3. Training Aids viz. Simulators, associated equipment, software and computer based training modules.

4. Guidance and Navigation equipment.
5. Test facilities and equipment required for testing, certification, qualification and calibration of the above products.
6. Software specially designed, developed or modified for the above products.

D. Services (related to eligible products)

1. Maintenance, repair and overhaul.
2. Up gradation/life extension
3. Engineering, design and testing.
4. Software development.
5. Quality assurance.
6. Training.
7. Research and Development services (from government recognised R&D facilities).

Notes: Investment in civil infrastructure is excluded from the list of eligible products and services, unless specifically indicated.

Annexure IX

List of Critical Technologies for Acquisition by DRDO through Offsets

1. MEMs based sensors, actuators, RF devices, Focal plane arrays.
2. Nano technology based sensors and displays.
3. Miniature SAR & ISAR technologies.
4. Fiber Lasers Technology.
5. EM Rail Gun technology.
6. Shared and Conformal Apertures.
7. High efficiency flexible Solar Cells technology.
8. Super Cavitations technology.
9. Molecularly Imprinted Polymers.
10. Technologies for Hypersonic flights (Propulsion, Aerodynamics and Structures).
11. Low Observable Technologies.
12. Technologies for generating High Power Lasers.
13. High Strength, High-modulus, Carbon Fibers, Mesophase pitch-based fiber, Carbon Fiber Production Facility.
14. Pulse power network technologies.
15. THZ Technologies.

The monograph makes an attempt to estimate India's defence self-reliance index, which has been a subject of intense debate in recent years. It also surveys the key recommendations of various high level committees set up by the Indian government post the Kargil conflict. A critical analysis of various policy measures taken or contemplated by the Ministry of Defence to facilitate higher indigenous production has also been made. The monograph concludes with key policy measures to revitalize India's moribund defence industry.

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