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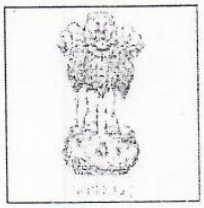
MINISTRY OF DEFENCE
DEPARTMENT OF DEFENCE PRODUCTION

PREPAREDNESS OF ARMED FORCES – DEFENCE PRODUCTION AND PROCUREMENT

COMMITTEE ON ESTIMATES
2018-19

TWENTY-NINTH REPORT

SIXTEENTH LOK SABHA



LOK SABHA SECRETARIAT
NEW DELHI

TWENTY-NINTH REPORT

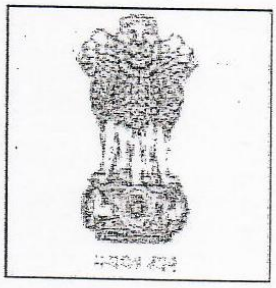
COMMITTEE ON ESTIMATES

(2018-19)

(SIXTEENTH LOK SABHA)

MINISTRY OF DEFENCE
DEPARTMENT OF DEFENCE PRODUCTION

(Presented to Lok Sabha on 25 July, 2018)



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LOK SABHA SECRETARIAT

NEW DELHI

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26. Shri Arvind Sawant
27. Shri Ganesh Singh
28. Shri Kirti Vardhan Singh
29. Shri Rajesh Verma
30. Shri Jai Prakash Narayan Yadav

* Elected vide Lok Sabha Bulletin Part-II No. 987 dated 03.012.2014 consequent upon vacancy caused by the appointment of Shri Hari Bhai Chaudhary, Member of Lok Sabha in the Council of Ministers w.e.f. 09.11.2014.

^ Elected vide Lok Sabha Bulletin Part-II No. 987 dated 03.012.2014 consequent upon vacancy caused by the appointment of Shri Ram Kripal Yadav, Member of Lok Sabha in the Council of Ministers w.e.f. 09.11.2014.

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8 Choubey, Shri Ashwini Kumar
9 Choudhary, Col. (Retd) Sona Ram
10 Choudhary, Shri Ram Tahal
11 Deka, Shri Ramen
12 Dhotre, Shri Sanjay Shamrao
13 Gaddigoudar, Shri Parvatagouda Chandanagouda
14 Gupta, Shri Sudheer
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22 Pandey, Shri Ravindra Kumar
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24 Reddy, Shri J.C. Divakar
25 Salim, Shri Mohammad
26 Sawant, Shri Arvind Ganpat
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28 Singh Deo, Shri Kalikesh Narayan
29 Singh, Shri Ganesh
30 Verma, Shri Rajesh
31 Yadav, Shri Jay Prakash Narayan

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9.	Shri P. Kumar	
10.	Shri Anil Shirole	

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Dr. Murli Manohar Joshi – Chairperson

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4. Shri George Baker
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6. Shri Dushyant Chautala
7. Shri Ashok Shankarrao Chavan
8. Shri Ashwini Kumar Choubey
9. Shri Ram Tahal Choudhary
10. Col. Sonaram Choudhary
11. Shri Ramen Deka
12. Shri Sanjay Dhotre
13. Shri P.C. Gaddigoudar
14. Shri Sudheer Gupta
15. Smt. Kavitha Kalvakuntla
16. Shri P. Kumar
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19. Shri Rajesh Pandey
20. Shri Ravindra Kumar Pandey
21. Shri Raosaheb Danve Patil
22. *Shri Bhagirath Prasad
23. Shri Konakalla Narayan Rao
24. Md. Salim
25. Shri Arvind Ganpat Sawant
26. Shri Jugal Kishore Sharma
27. Shri Gajendra Singh Shekhawat
28. Shri Anil Shirole
29. Shri Rajesh Verma
30. Shri Jai Prakash Narayan Yadav

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*Elected *Vide* Lok Sabha Bulletin Part-II No. 3908 dated 28.07.2016 vice Shri Arjun Ram Meghwal appointed as Minister.

COMPOSITION OF THE COMMITTEE ON ESTIMATES (2017-18)

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6. Shri Ashwini Kumar Choubey
7. Shri Dushyant Chautala
8. Shri Ram Tahal Choudhary
9. Col. Sonaram Choudhary
10. Shri Ramen Deka
11. Shri Sanjay Dhotre
12. Shri P.C. Gaddigoudar
*13. Shri Prakash B. Hukkeri
14. Smt. Kavitha Kalvakuntala
*15. Smt. Raksha Khadse
*16. Dr. Sanjay Jaiswal
17. Shri P. Kumar
18. Shri Rajesh Pandey
19. Shri Ravindra Kumar Pandey
*20. Shri Nanabhou Falgunrao Patole
21. Dr. Bhagirath Prasad
*22. Smt. Ranjeet Ranjan
23. Shri Konakalla Narayan Rao
*24. Shri Y.V. Subba Reddy
25. Shri Arvind Ganpat Sawant
*26. Shri Arjun Charan Sethi
*27. Shri Janardan Singh Sigriwal
28. Shri Jugal Kishore Sharma
29. Shri Gajendra Singh Shekhawat
30. Shri Jay Prakash Narayan Yadav

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* New Members

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3. Shri George Baker
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5. Shri Ramesh Bidhuri
6. Shri Dushyant Chautala
7. Shri Ram Tahal Choudhary
8. Col. Sonaram Choudhary
9. Shri Ramen Deka
10. Dr. Ratna Dey (Nag)
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12. Shri Nishikant Dubey
13. Shri P.C. Gaddigoudar
14. Shri Prakash B. Hukkeri
15. Dr. Sanjay Jaiswal
16. Smt. Kavitha Kalvakuntala
17. Smt. Raksha Khadse
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20. Shri P. Kumar
21. Shri Rajesh Pandey
22. Shri Ravindra Kumar Pandey
23. Dr. Bhagirath Prasad
24. Smt. Ranjeet Ranjan
25. Shri Rajiv Pratap Rudy
26. Shri Md. Salim
27. Shri Arvind Ganpat Sawant
28. Shri Kalikesh Narayan Singh Deo
29. Shri Jugal Kishore Sharma
30. Shri Jay Prakash Narayan Yadav

SECRETARIAT

1.	Smt Sudesh Luthra	-	Additional Secretary
2.	Shri N.C Gupta	-	Joint Secretary
3.	Shri Vipin Kumar	-	Director
4.	Shri Sujay Kumar	-	Under Secretary

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INTRODUCTION

I, the Chairperson of the Committee on Estimates, having been authorized by the Committee to submit the Report on their behalf, do present this Twenty-ninth report on 'Preparedness of Armed Forces: Defence Production and Procurement '.

2. The Committee considered and adopted the Report at their sitting held on 26th April, 2018.

3. India's commanding presence over the important navigational passage of northern Indian Ocean, with a coastline of about 7500 kms of which 6100 kms are in mainland while the remaining are in islands, and Country's land borders being twice that of maritime borders makes the location of the country strategically important. Though earnest efforts have been made to strengthen the defence preparedness of the country, in the current geo-political scenario, a country of the size of India does not have the luxury of focusing solely on economic policies and waiting for a minimum level of prosperity before undertaking measures to become strong. Defence preparedness has to go side by side with economic prosperity and resources have to be allocated in such a manner that both are promoted. In a country like India, keeping in view the geo-strategic milieu we exist in, we cannot afford to let our guard down so far as defence preparedness is concerned.

4. To evaluate various issues related to the preparedness of armed forces with specific reference to defence production and procurement, and steps taken by the Government in this regard, the Committee on Estimates (2014-15) selected this subject for in-depth examination and report to the House. The Committee on Estimates (2015-16); (2016-17); (2017-18) and (2018-19) continued with the examination of the subject.

5. In this report, the Committee have dealt with various issues like availability of financial resources for defence related expenditure, extent of self-reliance in defence sector, modernisation of different wings of armed forces, shortage of arms and ammunitions, performance of Defence PSUs such as Ordnance Factory Boards,

DRDO, involving private sector and MSMEs in Defence related activities, our preparedness for future wars and international cooperation. The Committee have analysed these issues in detail and have made observations/recommendations in the report.

6. The Committee held sittings on 29.06.2015, 13.10.2015, 20.11.2015, 28.02.2017, 11.04.2017 and 21.06.2017 to take oral evidence of domain experts and the representatives of the Ministry of Defence (Defence of Defence Production). The draft report was considered and adopted by the Committee at their sitting held on 22.05.2018.

7. The Committee place on record their sincere thanks to various domain experts, S/Sh. Bharat Karnad, Brahma Chellaney, C. Uday Bhaskar, Major General (Retd.) G.D. Bakshi and K.S. Bajpai who appeared before the Committee and also furnished written Memoranda as desired by the Committee. While taking note of data/ information furnished by the Ministry of Defence (Department of Defence Production) during the course of examination of the subject, the Committee would like to express their displeasure over the inordinate delay on their part in responding to communications sent by the Committee (For reference, please see Statement).

8. For facility of reference and convenience, the observations/recommendations of the Committee have been printed in Bold in Part-II of the Report.

NEW DELHI;
July, 2018
Sravana (Saka)

DR. MURLI MANOHAR JOSHI,
CHAIRPERSON,
ESTIMATES COMMITTEE.

Statement reg communication sent to the Ministry of Defence *w.r.t.* 'Preparedness of Armed Forces: Defence Production and Procurement'

Sl. No.	Mode of Communication	Date	Contact Person
1.	OM (No. 29/1/1/EC/2016-17)	23.04.2018	Secretary, DDP, MoD
2.	Phone	24.04.2018	US, MoD
3.	Phone	24.04.2018	JS, MoD
4.	Phone	24.04.2018	DS, MoD
5.	Phone	25.04.2018	Secretary, MoD
6.	Phone	25.04.2018	JS, MoD
7.	Phone	25.04.2018	US, MoD
8.	Phone	25.04.2018	DS, MoD
9.	OM (No. 29/1/1/EC/2016-17)	26.04.2018	Secretary, DDP, MoD
10.	Phone	26.04.2018 (1118 hrs)	Secretary, MoD
11.	Phone	26.04.2018	JS, MoD
12.	Phone	26.04.2018 (1308 hrs)	US, MoD
13.	Phone	01.05.2018 (1417 &1423 hrs)	US, MoD
14.	Phone	16.05.2018 (0959 & 1009 hrs)	US, MoD
15.	Email	26.06.2018 (1427 hrs)	US, MOD

Part I

Chapter 1

Overview of Defence Sector and Allocation of Resources

1.1 Introductory

India is the second most populous country of the world with a population of more than 1.25 billion. The total area of the Country is about 32 lakh sq km which makes it the seventh largest Country in terms of area. Its GDP in nominal terms is sixth largest in the world while in PPP terms it is the third largest behind the USA and China.

1.1.1 India has a strategic location in Southern Asia and has commanding presence over the important navigational passage of northern Indian Ocean between populous East Asia and resource rich West Asia and Africa. It has a coastline of about 7500 kms of which 6100 kms are in mainland while the remaining are in islands. The Country's land borders are twice that of maritime borders, i.e., 15000 kms of which 3323 kms are with Pakistan and 3380 kms are with China. Because of historical as well as strategic reasons, India's western, north-western, northern and north-eastern borders have remained volatile. Though we have remained a peace loving country and have undertaken earnest efforts to maintain and promote peace with all our neighbours, on account of our strategic location and volatile state of relations with some of our neighbouring countries, the defence of the Country has to be given paramount importance.

1.1.2 India has a long tradition of strategic thinking. Kautilya was probably the first scholar of the world who presented structured thought on Defence Preparedness. His famous quote " शस्त्रेण रक्ष्यते राष्ट्रे शास्त्रचर्चा प्रवर्तते" meaning that any discussion whether it is academic economic, literary or spiritual - can only take place if you are well protected by your armed forces. A country can have economic and cultural prosperity only if it is secure.

1.1.3 In the current geo-political scenario, a country of the size of India does not have the luxury of focusing solely on economic policies and waiting for a minimum level of prosperity before undertaking measures to become strong. Defence preparedness has to go side by side with economic prosperity and resources have to be allocated in such a manner that both are promoted. In a country like India, keeping in view the geo-strategic milieu we exist in, we cannot afford to let our guard down so far as defence preparedness is concerned.

1.2 Allocation of Resources for Defence Sector

1.2.1 Allocation of financial resources for Defence Services has remained an area of concern in the recent years. When queried about the share of Defence expenditure as a percentage of GDP as well as total Government expenditure, the Ministry of Defence in reply to written question, submitted the following:

Details of Defence Service Estimates, GDP and Central Government Expenditure for the last 5 years are as under:-

(Rs. in Crores)

Year	**Defence Expenditure**	**Total CGE (Actuals)**	**Def. Exp % age of CGE**	**GDP**	**Def. Exp % age of GDP**
2012-13	1,18,776	14,10,372	12.89	92,80,803	1.96
2013-14	2,03,499	15,59,447	13.05	99,21,106	2.05
2014-15	2,18,694	16,63,673	13.15	1,06,35,426	2.06
2015-16	2,25,895	17,90,783	12.60	1,14,43,718	1.96
2016-17	2,25,890 (Expdr. Upto March Pre)	20,14,407	12.30	1,50,75,429	1.50
2017-18 (BE)	2,62,390	21,46,735	12.20	1,68,47,455	1.56

As reported in the media, the defence expenditure at 1.56 % of GDP was the lowest since 1962, when India and China fought a war.

1.2.2 On being queried about the defence budget as a percentage of GDP in other developed countries, an expert of defence, in an oral submission, stated that:

> "In US, it is 2.3 per cent, in Russia it is very high; In China, they have brought it down but look at the size of their GDP, it is about four times of ours. Russia has 5.4 per cent because its only export is in defence area in terms of technology. They have been trying to increase their defence budget. By increasing their military capability, they have been able to pose a challenge to the US. You can see the results in Ukraine and Syria."

1.2.3 Highlighting the inadequacy of budgetary allocation to Defence, an expert of defence in a written submission submitted to the Committee that:

> ".....Defence Budget as a percentage of GDP is still broadly following the guidelines laid down by the 13th Finance Commission. Though the 14th Finance Commission had clearly acknowledged that it had no competence to lay down the capital acquisition budget, bureaucratic inertia has resulted in the 13 Finance Commission recommendations being followed nevertheless. Today at 1.6% of the GDP, India's defense budget to GDP ratio has reached the levels we had before 1962.The implications could be ominous."

1.2.4 In an analysis of Defence budget 2017-18 by the PRS India, it is shown that the expenditure on account of salary and pension of defence personnel has been increasing in the recent years while capital expenditure is going down.

> "….In 2016-17, Ministry of Defence spent Rs 3,45,106 crore according to the revised estimates, 1% more than the budget estimates (Rs 3,40,922 crore). This was primarily due to higher expenditure on salaries and pensions of Army, Navy and Air Force. On the other hand, the expenditure on capital outlay was 8% below the budget estimates 2016- 17. The government had budgeted to spend Rs 86,298 crore on purchase of defence capital, but revised estimates provide that Rs 79,327 crore have been spent. Among the three services, the capital outlay on Army, Navy and Air Force was 11%, 11% and 5% lower than Budget Estimates 2016-17 respectively. Salaries and pensions comprise half the budget In 2017-18, salaries and pensions of the defence services form the largest portion of the defence budget (50% of the budget or Rs 1,80,823 crore). This is followed by capital outlay (24% or Rs 86,488 crore), i.e. expenditure on defence equipment, weaponry, aircrafts, naval ships, land, etc. The remaining allocation is toward stores (includes ammunition, spares and other items required for maintenance of defence equipment), administration of the defence services, construction of roads and bridges, the Coast Guard, etc….."

1.2.5 According to the Stockholm International Peace Research Institute (SIPRI), Defence Expenditure as percentage of GDP in some of the developed countries is as under :

Defence Expenditure as share of GDP

Country	2007	2017
China	1.9	1.9
France	2.3	2.3
USA	3.8	3.1
UK	2.2	1.8
Russia	3.4	4.3
Saudi Arabia	8.5	10.3

1.2.6 In response to a question regarding share of capital expenditure and revenue expenditure components in Defence budget over last five years, the Ministry submitted the following figures:

Details of Revenue and Capital Expenditure Components in Defence Budget in the last 5 years.

(Rs. in Crores)

Year	**Actuals**			**Ratio of Revenue and Capital Expenditure**	
	Revenue	**Capital**	**Total**	**Revenue**	**Capital**
2012-13	111276.66	70499.12	181775.78	61	39
2013-14	124374.30	79125.05	203499.35	61	39
2014-15	136807.20	81886.98	218694.18	63	37
2015-16	145936.54	79958.31	225894.85	65	35
2016-17	145840.86	80049.61	225890.47	65	35

As per IDSA website, the following data with regard to Revenue and Capital Expenditure for the years 2017-18 and 2018-19 is provided:-

Defence Budget Allocations for 2017-18 and 2018-19

Year	Revenue Expenditure (Rs in Crore)	Capital Expenditure (Rs in Crore)	Total (Rs in Crore)
2017-18 (BE)	1,72,774	86,488	2,59,262
2017-18 (RE)	1,76,516	86,488	2,63,004
2018-19 (BE)	1,85,323	93,982	2,79,305

The ratio of revenue and capital expenditure during 2017-18 and 2018-19 is 67:33 and 66:34 respectively.

1.2.7 On a specific query regarding Budget and Expenditure on Capital Procurement for forces, following figures were provided by the Ministry:-

(Rs. in Crore)

Year	BE	RE	Actuals
2015-16	77406.69	65400.00	61761.80
2014-15	75148.03	66151.73	65865.93
2013-14	73444.59	66406.41	66850.30
2012-13	66032.24	57395.46	58768.86

1.2.8 When queried about the budget requirement and allocation of funds for the Defence acquisitions, Secretary (DP) stated to the Committee in an oral evidence that:-

> "…..डिपार्टमेन्ट ऑफ डिफेन्स से हमें सुनने में आता है कि requirement of the forces is very high and the fund allocation to that extent is not there. इसकी रिक्वॉयरमेन्ट प्रोजेक्ट करना और उसके एलोकेशन का काम डिपार्टमेन्ट ऑफ डिफेन्स देखता है। हम लोग मीटिंग्स में सुनते हैं कि इसकी रिक्वॉयरमेन्ट बहुत है। उनके द्वारा 15 साल की रिक्वॉयरमेन्ट के लिए एल.डी.आई.पी.पी. **LTIPP** बनाया गया है। इसके अनुसार 2, 5 या 10 सालों के हिसाब से वे अपनी रिक्वॉयरमेन्ट प्रोजेक्ट करते हैं, लेकिन जितनी जरूरत होती है, उसके हिसाब से बजट का एलोकेशन नहीं हो पाता है। इस कारण बजट के एलोकेशन के हिसाब से ही प्रोक्योरमेन्ट होती है।"

Chapter 2

Defence Production

The Department of Defence Production (DDP) was set up in November 1962 with the objective of developing a comprehensive production infrastructure to produce the weapons/systems/platforms/equipments required for defence. Over the years, the Department has established wide ranging production facilities for various defence equipments through the Ordnance Factories and Defence Public Sector Undertakings (DPSUs). The products manufactured include arms and ammunition, tanks, armoured vehicles, heavy vehicles, fighter aircraft and helicopters, warships, submarines, missiles, ammunition, electronic equipment, earth moving equipment, special alloys and special purpose steels.

2.1 The organizations under the Department of Defence Production are as follows: •

(i) Ordnance Factory Board (OFB)

(ii) Hindustan Aeronautics Limited (HAL)

(iii) Bharat Electronics Limited (BEL)

(iv) Bharat Dynamics Limited (BDL)

(v) BEML Limited (BEML)

(vi) Mishra Dhatu Nigam Limited (MIDHANI)

(vii) Mazagon Dock Shipbuilders Limited (MDL)

(viii) Garden Reach Shipbuilders & Engineers Limited (GRSE)

(ix) Goa Shipyard Limited (GSL)

(x) Hindustan Shipyard Limited (HSL)

(xi) Directorate General of Quality Assurance (DGQA)

(xii) Directorate General of Aeronautical Quality Assurance (DGAQA)

(xiii) Directorate of Standardisation (DOS)

(xiv) Directorate of Planning & Coordination (Dte. of P&C)

(xv) Defence Exhibition Organisation (DEO)

(xvi) National Institute for Research & Development in Defence Shipbuilding (NIRDESH).

2.2 In pursuance of Budget Speech 2018-19, the Department of Defence Production of the Ministry of Defence has brought out a draft policy, 2018, which states as under:

"Preamble

1.1 Self-reliance in defence production has been the goal of India's defence production strategy since 1960s. Government has also announced a Defence production Policy 2011. Significant progress in domestic defence production has been made. India defence production has progressively increased from Rs. 43,746 crores in 2013-14 to Rs. 55,894 crores in 2016-17. Defence PSUs like HAL in aero, MDL, GRSE, GSL and HSL in naval, BDL, BEML, MIDHANI and OFBs in land systems and BEL in electronics have emerged as significant players in the defence production ecosystem in the country. Several platforms like Air Defence Missile System 'Akash', Light Combat Aircraft 'Tejas', Main Battle Tank 'Arjun', Ballistic Missiles like 'Prithvi', 'Agni', Multi Rocket Launcher System 'Pinaka', Central Acquisition Radar have been designed and produced indigenously and several others like Fighter Aircraft Sukhoi Su-30 MKI & T-90 Tank have been produced based on transfer of technology. The Private sector and Public-Private Partnerships through Joint Ventures (JVs)/ Foreign Direct Investment (FDI) have also joined the national effort in building the domestic defence and aerospace industry. However, it is also true that despite some salient achievements of our defence production ecosystem, a significant part of our defence requirements continue to be dependent on imports. India has become one of the largest importer of defence goods and services in the world. This needs to change.

1.2 A vibrant defence industry is a crucial component of effective defence capability, and to achieve national sovereignty and military superiority. The attainment of the same shall ensure:

1.2.1 Strategic independence

1.2.2 Sovereign capability in selected areas

1.2.3 Cost effective defence equipment

1.2.4 Collateral benefits ensuing from the endeavours of the defence industry

1.2.5 To reduce the life cycle cost through indigenous sourcing, facilitating life extension and upgrades of platforms and systems.

1.3 R&D and innovation are important determinants of defence production capabilities. The technology change in the information arena, the biological arena and the nano-technology arena is not only going to have a profound impact on military operations, but will also require a much more responsive defence industry, especially in light of the decreasing predictability of future needs. DRDO has 52 labs across all domains of defence for R&D in defence related requirements and has played an important part in new technology 2 development in the country. However, we continue to manufacture several technological platforms under licensed-production. World over defence has been a major

reason and determinant of technological growth and development. We need to develop cutting-edge technologies including additive technologies, to be able to achieve leadership in defence products and materials.

1.4 India has emerged as a top destination for R&D Centres in the world, ahead of US China in 2015 and the trend continues. The R&D strength of India needs to be channelized for creating domestic IPR for defence needs. With the launch of Start-Up India program, India has also become the hotspot of start-up activity in the world, having the thirdlargest start-up ecosystem globally. These strengths need to be leveraged to catapult India as a developer of next level of frontier defence technologies in the world in the field of aerospace and defence.

1.4.1 New and emerging technologies like Artificial Intelligence and Robotics are arguably the most important determinants of defensive and offensive capabilities for any defence force in the future. Most leading countries are working frantically to achieve leadership in these technologies. Cyber space has opened the fourth domain of warfare, beyond Army, Navy and Air force. India, with its leadership in IT domain needs to use this technology tilt to its advantage.

1.5 Government has as part of its 'Make in India' programme has given a new impetus to development of defence production in the country both for its need and also for exporting to friendly countries. Several initiatives have been taken in the last three years to promote greater participation of industry. These include revision in Defence Procurement Procedures to introduce 'Make-I' and 'Make-II' processes, introduction of Strategic Partnership Model, increase in FDI through automatic route to 49%, restricting licensing requirements for critical items, denotifying several items previously produced only by OFBs for production by industry etc.

1.7 Defence Production Policy 2018 attempts to further build on these initiatives and provides a focussed, structured and significant thrust to development of defence design and production capabilities in the country.

Vision

To make India among the top five countries of the world in Aerospace and Defence industries, with active participation of public and private sector, fulfilling the objective of self-reliance as well as demand of other friendly countries.

Goals and Objectives

The policy has the following goals and objectives:

3.1 To Create a dynamic, robust and competitive defence and aerospace industry as an important part of the 'Make in India' initiative.

3.2 To create a tiered defence industrial ecosystem in the Country.

3.3 To reduce current dependence on imports and to achieve self-reliance in development and manufacture of following weapon systems/platforms latest by 2025:-

3.3.1 Fighter Aircraft.

3.3.2 Medium Lift and Utility Helicopters.

3.3.3 Warships.

3.3.4 Land Combat Vehicles.

3.3.5 Autonomous Weapon Systems.

3.3.6 Missile Systems.

3.3.7 Gun systems.

3.3.8 Small Arms.

3.3.9 Ammunition and Explosives.

3.3.10 Surveillance Systems.

3.3.11 Electronic Warfare (EW) Systems.

3.3.12 Communication Systems.

3.3.13 Night Fighting Enablers.

3.3.14 Submarines/Submersibles

3.3.15 Unmanned Aerial Vehicles

3.3.16 Training Equipments and Simulators

3.4 To achieve a turnover of Rs 1,70,000 Crores (USD 26 Bn approx) in aerospace and defence goods and services by 2025 involving additional investment of nearly Rs70,000 Crores (USD 10 Bn approx) creating employment for nearly 2 to 3 Million people.

3.5 To achieve export of Rs 35,000 Crores (USD 05 Bn approx) in defence goods and services by 2025.

3.6 To make India as a global leader in Cyberspace and AI technologies.

3.7 To facilitate inculcation of zero defect zero effect (ZED) manufacturing culture amongst MSMEs resulting in creation of quality conscious and responsible manufacturers.

3.8 To create an environment that encourages R&D, rewards innovation, creates Indian IP ownership and robust and self-reliant defence industry

.....FDI

9.1 FDI regime in defence will be further liberalised.

9.2 FDI up to 74% under automatic route will be allowed in niche technology areas if OEM wishes to establish manufacturing facilities with levels of indigenisation higher than prescribed in 'Buy (Indian-IDDM)' category in Defence Procurement Procedure (DPP)."

2.2.1 The Department of Defence Production in the written reply with response to strategic partnership (SP) model has stated as under:

"SP Model which envisages establishment of long-term strategic partnerships with Indian Private entity through a transparent and competitive process, wherein they would tie up with global OEMs to seek technology transfers to set up domestic manufacturing infrastructure and supply chains."

2.2.2 The representative of the Ministry of Defence in the course of deposition apprised the Committee that out of our target for defence production we are able to produce indigenously, 40 % and 60% is still imported which is not good.

2.3 Ordnance Factory Boards (OFB)

2.3.1 Indian Ordnance Factories are the oldest and largest industrial setup which functions under Ordnance Factory Board (OFB) with the primary objective of achieving self-reliance in equipping the armed forces with state-of-the-art battlefield equipment.

Core competence of Ordnance Factories

Weapons	Small, Medium and Large Calibre Weapons & Mortar Equipment
Ammunition, Explosives & Propellants	Small, Medium and Large Calibre Ammunition, Mortar Bombs, Signaling and related stores, Rockets & Aerial Bombs, Fuzes, Explosives, Chemicals & Propellants
Military Vehicles	Trucks, Mine protected and Special Security Vehicles
Armoured Vehicles	Tanks & its variants, Armoured Personnel Carrier (APCs) & Engines
Instruments & Optical devices	Night & Day Vision Sights & Instruments
Parachutes	Brake Parachutes, Man dropping & Supply dropping Parachutes
Troop comfort & General Stores	Tentage, Clothings, Personal equipment, Bridges, Boats, Cables etc.

2.3.2 The turnover of the OFBs during the financial year 2015-16 was Rs 14158 crore. The turnover for 2016-17 upto December 2016 is Rs. 9154 crore including taxes and duties. OFB is continuously modernizing its existing facilities by replacing age old machines with the state-of-the-art machines to manufacture quality products, taking into account the current and long term future requirements of the customers. To achieve this, a Comprehensive Modernisation Plan has been prepared and a total expenditure of Rs 5663 crore is planned to be made during 12th Plan for modernisation of OFB.

2.3.3 When asked about the Modernization of Ordnance Factories, Secretary (DP) submitted to the Committee in an oral submission that:-

> "there are two types of expenditure which we are incurring on ordnance factories. One is the replacement of old machinery which is a continuous process because machinery as and when it becomes obsolete gets replaced by the new ones.
>
> In a number of cases, we are now purchasing CNC machines instead of usual milling machine, lathe machine and drilling machine etc., which are all computer operated and very few workers can give very good output. Human intervention is very less. That is why despite the number of workers coming down in ordnance factories, our output is going up. It is not a question of only reducing the number of employees but also a question of reducing human intervention because wherever we find that human intervention has come down, quality has gone up. For example, mixing of explosives. If it is manual, obviously, the mixing will not be that good but if it is a automated, then quality definitely goes up. So, we are modernising ordnance factories wherever it is required. My estimate is, around Rs. 5000 crore we are spending in a plan year which means around Rs. 1000 crore per annum is spent on ordnance factories for capital procurement"

2.3.4 Following figures were provided regarding investment made/proposed in the OFBs

(A) Investment made during 11th plan (in Cr.)

2007-08	2008-09	2009-10	2010-11	2011-12	Total
364	627	492	703	767	2956

Investment plan during 12 plan

(in Cr.)

2012-13	2013-14	2014-15	2015-16	2016-17	Total
783	1156	1250	1632	3402	8635

2.3.5 Regarding salient features of Research and Development in OFBs, the Ministry submitted in a presentation to the Committee the following:

- R&D activities started in 2006 in a structured way
- Prior to 2006, OFB focused on TOT absorption and Licensed activities
- R&D efforts were focused on process improvement
- Production was prime focus for recruitment and training personnel
- 12 Ordnance Development Centres (ODC)are functioning
- 105 of OFBs revenue comes from products developed through in house R&D.

2.3.6 Achievements and Awards of OFBs :

• Ordnance Factory Medak in association with DRDO has indigenously developed and supplied the first NBC vehicle to Indian Army

• OFB has participated in RFP of upgunning of 130 mm Gun to 155 mm x 45 calibre Gun and the OFB Gun has undergone successful field trial at PFFR Pokharan against RFP issued by the user.

• Kavach MOD-II Chaff launcher system has been developed, manufactured and installed onboard INS Chennai. The Installation Test Firing of Long & Medium Range Launchers of Kavach MOD-II was successfully carried out for the first time onboard a Naval ship.

• OFB has developed 7.62 x 39 mm Assault rifle “GHAATAK” as an alternative to AK-47.

• OFB has successfully developed Bi-Modular Charge System (BMCS) and issued to Indian Army.

• OFB’s newly developed 155 mm x 45 Calibre Gun “Dhanush”, which is one of the Major Products under “Make in India” theme, was chosen for display in Republic Day Parade 2017 at New Delhi.

2.3.7 The Ministry of Defence, in a presentation to the Committee, outlined the following future challenges for the OFBs:

- Increase the turn over to Rs. 20000 crore in three years.
- Reduce response time for delivery
- Improvement in Product Quality/safety needs
- Modernize & Upgrade core competence and reduce non-core activities
- Expand R&D activities for development of new products and technology absorption.
- to be 'Lead Integrator'
- Transition from 'Nomination Basis' to 'Competitive basis'

2.3.8 The Ministry of Defence in a presentation to the Committee stated the following constraints:

- Non-Uniform demand from Armed Forces & Security Forces
- Uneconomic quantities to be produced to meet strategic needs
- Difficulties in entering into long term agreement with dedicated vendors
- Low scale of production does not attract the vendors to respond to our LTE/OTE.

2.3.9 Asked about the shortage of ammunition for forces and limited capabilities of OFBs, a representative of MOD stated that as regards heavy equipment----, OFB indigenously produces 87% component whereas import content is 13 %. The representative further stated as under:

> 'क्रिटिकटलिटी केवल 10-15 एम्यूनेशन में है, शेष में हम कम्फर्टेबल है उसमें हमारी प्रोडक्शन कैपिसिटी पर्याप्त है, उसमें हम आर्मी नेवी और एयर फोर्स की रिक्वायरमेंट को पूरा कर रहे हैं, छोटे पड़ोसी देश को हम छोटे एम्यूनेशन एक्सपोर्ट करने की स्थिति में है लेकिन टैंक **एम्युनिशन** के प्रोडक्शन में हमारी क्षमता उतनी नहीं है, उस कैपिसिटी को हम बढ़ाने का प्रयास कर रहे हैं जिससे हम अपनी आवश्यकताओं को पूरा कर सकें। टोटलिटी में **बहुत ज्यादा** कमी नहीं है लेकिन इंडिव्ज्यूअल **मामलों** में कमी है। '

2.3.10 On the issue of services' dissatisfaction with the quality of the armaments, the Committee were apprised by the Ministry as under:

> "There are certain issues with certain types of ammunition which we have. We have some of the tank ammunition regarding which we have had issues. The OFB is addressing these issues. There have been issues with some of our other types of ammunition also which the OFB is addressing in its own way. It has improved the quality of its production.

2.3.11 The representative of the Ministry of Defence during the course of oral deposition held on 20.11.2015 apprised the Committee that the availability of the aircraft is 60 percent. In this context, the Committee were further apprised as under:

> " it is expected that there should be 70 per cent serviceability of these aircraft because many of them would go for standard maintenance checks. Normally it is expected as thumb rule that 70 per cent serviceability is there....

the Committee were further apprised as under:

> "....there is spares supply and there are repair rectifications. There is high rate of failures on certain rotables which are fitted on it. xxxxx We are working with Russians to find solutions to reduce the instance of failure of these rotables."

2.4 Acquisition/Upgradation of IAF

2.4.1 The representative of Ministry of Defence during the course of deposition apprised the Committee that upgrades of some MIGs have been done and would continue for some time. However all the MIGs would be phased out by 2025 and 2026.

In a written submission to the Committee, an expert stated as under:

> "....Our entire stock of Soviet era military equipment of the 1960s and 70s vintage had become due for turnover in 1990. Unfortunately , the Soviet Union(our subsidised source of cheap but cutting edge weaponary) collapsed in 1990. Our own economy came perilously close to collapse that year. We had to pend our military modernization for almost two decades till our liberalized economy became strong enough to support such modernization….. our air power is slipping badly even as the Chinese and Pakistani Air Force continue to expand and modernise. The Chinese Air Force already has 930 Fourth Generation fighter jets and these will likely go up to some 1300 by the next five years. We have less than 400 Fourth generation fighters to match these. Our squadron strength should have been 42 but it is dangerously down to 32 and actually
>
> perhaps closer to 28 squadrons. The Mig—21s of 1960s vintage are falling out of the skies. The Mig-23 and Mig- 27s are being phased out."

With regard to acquisition/upgradation for IAF, the following is mentioned in the Annual Report 2016-17:

> ”5.1 IAF is on a trajectory of modernisation and is transforming itself into a strategic aerospace power with full-spectrum capability. Capability enhancement through new acquisitions, replacement of obsolete equipment with state-of-the-art inductions and upgrade of legacy weapon platforms has been taken up to bolster operational potential and effectiveness. Forthcoming inductions of the Rafale aircraft, attack helicopters, heavy lift helicopters, force enhancers, Surface to Air Guided Weapon (SAGW) and Air Defence Radars, hold great promise for the future. Also, it has been a matter of great national pride, to usher in the first Tejas squadron of the IAF. Simultaneously, airfield infrastructure modernisation programme and up-gradations in communications network have strengthened the support structure for effective operations. While undertaking its modernisation, the IAF has taken an active and sustained role in the “Make in India” plan, to take forward indigenous production of combat aircraft, helicopters, weapon sensors and systems, besides other aviation equipment. A vibrant and flourishing domestic aviation capability would provide strategic military independence and boost economic growth.
>
> 5.2 Self-reliance in aerospace sector is a major key result area for the IAF. Efforts in field of research and development as well as manufacturing sectors have been stepped up, in order to reduce reliance on foreign sources. To give a boost to ‘Make in India’ initiative and achieve self-reliance in defence manufacturing sector, highest priority has been given to equipment manufactured in India.
>
> **Acquisitions and Upgrades**
>
> 5.3 Su-30 MKI: Induction of Su-30 MKI aircraft in the IAF is under progress and many squadrons are already operational in the IAF. Current lot of Su-30 MKI aircraft are being manufactured in HAL through transfer of technology. Advance indigenous weapons like Brahmos supersonic cruise missile and ‘Astra’ Beyond Visual Range (BVR) missile are being integrated and test fired from the aircraft.
>
> 5.4 Tejas Light Combat Aircraft: The first fighter squadron of the IAF with LCA Tejasaircraft, has been formed on July 1, 2016. Light Combat SU 30 MKI Chapter 5 Indian Air Force 37 Disaster Relief (HADR) operations in Nepal, Chennai, Male etc. 5.7 Apache Attack Helicopters: Letter of Agreement (LOA) was signed on September 28, 2015 between Government of India and United States Government (USG) and the contract was Aircraft (LCA) ‘Tejas’ is the first advanced, FlyBy-Wire fighter aircraft designed, developed and manufactured in India. Tejas is a 4th Plus generation aircraft with a glass cockpit and is equipped with state-of-the-art Satellite aided Inertial Navigation System. Tejas successfully participated in Bahrain International Air Show, from January 21-23, 2016 and also participated in ‘Exercise Iron Fist 2016’ in March 2016, displaying its

maneuverability and operational capability to the national leadership and the world.

5.5 **Rafale:** An Inter-Governmental Agreement for procurement of 36 Rafale aircraft, in fly away condition, has been signed between the Government of India and Government of French Republic on September 23, 2016. Globally, Rafale is one of the most modern aircraft which would boost the offensive capability of IAF and give enormous edge over adversary.

5.6 **C-130J**: IAF has already inducted C-130J aircraft and the delivery of balance aircraft is likely to be completed by July 2017. Night Vision Goggles are being procured for the fleet, which will enhance aircraft's night operations capability. C-130J has rendered exceptional service, in Humanitarian Assistance and Disaster Relief (HADR) operations in Nepal, Chennai, Male etc.

5.7 **Apache Attack Helicopters:** Letter of Agreement (LOA) was signed on September 28, 2015 between Government of India and United States Government (USG) and the contract was also signed with the Boeing Company of USA for the procurement of AH 64E Apache Attack Helicopters. The deliveries of Helicopters would commence in July 2019 and are expected to be completed by March 2020. Apache helicopter with its advance fire control radar and lethal weapons would enhance strike capability against ground targets, radars and enemy armour in battlefield.

5.8 **Chinook Heavy Lift Helicopters:** IAF is procuring CH-47F(I) Chinook Heavy Lift Helicopters. Deliveries of these helicopters are expected to be completed by March 2020. These helicopters would provide IAF, unique capabilities to ship heavy load to inaccessible areas. It would also be a great asset for Humanitarian Assistance and Disaster Relief (HADR) operations.

5.9 **Aircraft Upgrade:** Comprehensive upgrade programmes have been marked out for various fleets to boost their capabilities and ensure operational relevance. Mirage 2000 and MiG-29 aircraft upgrade is under progress and few upgraded aircraft have already been operationalised in the IAF. IOC D&D for DARIN III upgrade of Jaguar aircraft has been completed and series upgrade is under progress. Re-equipping of An-32 is also under progress. IAF will also be upgrading its IL-76/78 fleet and Chinook Mi-17 helicopters and will be enhancing the capabilities of Su-30 MKI aircraft."

2.4.2 The Ministry during the course of evidence apprised the Committee that investment of Rs.15000 crore is estimated to be made in the next five years towards enhancing production rate of LCA Tejas from 8 to 16 aircraft. The Secretary, Defence during the course of deposition further submitted as under:

"For Tejas, we are giving orders which are in the pipeline. HAL is being given orders for another 83 aircrafts. They have already got the orders for 43 of them and another 83 will be sufficient for next 25-26 years".

In this connection, HAL, in response to queries raised about the order book position of HAL, during the informal discussion with HAL during the study visit to Hyderabad, stated as under :

> "The firm orders with HAL would be liquidated by 2020-21. As the production cycle for aircraft build is very high of the order of 2 to 3 years, additional orders for aircraft/helicopters may be finalized well in advance so that installed infrastructure and skilled manpower are used optimally. Additional orders to keep the production facilities utilised, beyond 2020-21, at Aircraft Division-Kanpur and Helicopter Division-Bengaluru, Transport Aircraft Division-Kanpur and Helicopter Division-Bengaluru are essential"

2.4.3 While appreciating Tejas, one of the expert during evidence stated that Tejas product should be the bulk aircraft of Indian Air Force. It should be the prime export commodity to earn revenue.

2.5 Shortage of Trainer Aircraft/Accidents

2.5.1 When queried about the shortage of Trainer Aircraft, HAL in response to queries raised by members during the course of Study Visits apprised that Committee as under:

> Recently, IAF has decided to implement two stage training system, instead of three stage training, namely basic training and advance training.
>
> At present, IAF is using Pilatus PC-7 aircraft for basic training purpose and 75 of these aircraft are directly procured from OEM. Further requirement of basic training is proposed to be met by HAL's indigenously designed basic trainer aircraft HTT-40. Defence Acquisition Council (DAC) has cleared procurement case of 70 aircraft for IAF. The production of these aircraft is expected to commence during 2019-20.
>
> For the advance training purpose, IAF is using Hawk aircraft which is manufactured by HAL under Transfer of Technology from BAE System. HAL has so far supplied 82 Hawk aircraft to IAF and 17 Hawk aircraft to Indian Navy. Quotation has been submitted by HAL for additional requirement of 20 Hawks for IAF. Also, Navy has initiated action for 12 more Hawk aircraft for which HAL has submitted a budgetary quote".

2.5.2 The Committee have been apprised that designed and development programmes for Intermediate Jet Trainer(IJT) and Basic Trainer Aircraft(HTT-40) are under way at HAL. With regard to accidents, the Committee have been apprised by HAL as under:

> "Totally, 16 Dhruv helicopters have met with accidents so far in India. The reasons for these accidents as brought out in the report of Court of Inquiry (CoI)

have been mainly attributed to human error and environmental factors. In the event of crash of any aircraft, Court of Inquiry (CoI) is convened by services wherein HAL specialist is one of the members. The committee analyses the probable causes for the accident and recommendations are submitted to Services Headquarters. Based on the recommendations necessary improvements/mandatory checks, as required, are instituted by HAL across the fleet."

2.6 Shortage of Night Vision Equipment

2.6.1 The Ministry of Defence in the written replies has apprised the Committee as under:

"The status of Night Vision Equipment in Defence Forces is as under:

(a) In respect of Indian Army, as on date the holdings of Night Vision Equipment vis-a-vis authorization are ranging from 70% and 80%. The deficiencies are due to routine discard for which procurement cases are actively being processed.

(b) A contract for procurement of Night Vision Goggles for C-130 Aircraft has been signed on 16.09.2016.

(c) Third generation Night Vision Devices like Electro Optical Fire Control System (EON-51) and Stabilised Optronic Pedestals (SOP) have been fitted on Indian Navy Ships."

Defence Public Sector Undertakings: their Performance and Challenges

2.7 Hindustan Aeronautics Limited (HAL)

2.7.1 Hindustan Aeronautics Limited (HAL) is a Navratna DPSU with 20 production Divisions, 11 R&D centres and one Facility Management Division spread across the Country. HAL has so far designed and developed 17 types of Aircraft/ Helicopters, the latest being HTT-40 (Basic Trainer Aircraft) and Light Utility Helicopter (LUH). Major aircraft/ helicopters in the current production range are SU-30MKI, Hawk, Light Combat Aircraft (LCA), Dornier Do-228, ALH and Cheetal helicopters. The Company has achieved turnover of Rs 8619 crore (provisional) up to December 2016. Export Sales of Rs 335 crore has been achieved upto December 2016.

2.7.2 Following Important Events/ Achievements in 2016-17 are pointed out:

(i) MoU signed with the Indian Army for establishing MRO hubs for the ALH fleet on May 9, 2016. MRO hubs are planned to be established at two places to provide faster repair and maintenance support to ALH fleet of Indian Army.

(ii) Inaugural flight of HTT-40 took place on June 17, 2016 in the presence of Raksha Mantri.

(iii) The first carriage flight of Su-30MKI aircraft with Brahmos supersonic cruise missile carried out successfully on June 25, 2016.

(iv) First “Final Operational Clearance” upgraded Mirage-2000 aircraft was flown on July 28, 2016, a significant milestone in midlife upgrade of platforms to overcome obsolescence issue and enhance the reliability and maintainability of these aircrafts.

(v) Successfully conducted first technical flight of HAL’s indigenous LUH on September 6, 2016.

(vi) Shareholders Agreement for joint production of Kamov helicopters with Russian Helicopters, Rosoboronexport signed during the summit held at Goa on October 15, 2016.

(vii) Formation of Helicopter Engine MRO Pvt. Ltd., a Joint Venture Company, for ROH of Shakti & TM3332BD engines.

(viii) Formation of Naini Aerospace Ltd., a wholly owned Subsidiary.

(ix) Asia Pacific Aerospace Quality Group (APAQG) has conferred the membership to HAL under the category 'Full Member with voting rights' making India as the 7th nation to join APAQG.

2.7.3 HAL received following awards During 2016-17:

(i) 'SCOPE Excellence Award' for outstanding contribution to the Public Sector Management was presented by President.

(ii) “Performance Excellence Award 2015” Raksha Mantri in the cockpit of HTT-40 during its inaugural flight on June 17, 2016 at HAL airport, Bengaluru. 59 by Indian

Institution of Industrial Engineering (IIIE), in recognition of the achievements and contributions made by HAL towards the nation. Bharat Electronics Limited

2.7.4 Regarding modernisation plans of HAL, following information was submitted by the Ministry:

> "Infrastructure built at HAL over the years is being augmented to enhance the capacity and capability through modernization. The modernization plan includes up-gradation of technology through establishment of new processes, state-of-the-art manufacturing and design facilities, adoption of new IT tools, replacement of old/obsolete and low technology plant machinery and equipment. The new facilities planned for taking up production of on-going Design and Development programs will also have state-of-the-art production facilities with an aim to increase productivity, efficiency and improved work condition.
>
> Investment of around Rs. 15000 crore is estimated to be made in the next five years towards enhancing production rate of LCA Tejas from 8 to 16 aircraft, manufacturing facilities of LCH, green field manufacturing facilities for LUH, manufacturing facilities of HTT-40, facilities for enhancement of ROH of airframe and engines of Su-30 MKI, ROH facilities for Hawk aircraft and modernisation of existing facilities."

[BM pg 125-126]

2.7.5 Regarding key projects being handled by the HAL, following information was submitted during a presentation:

Project	Annual target	Status (Upto March 17)
Sukhoi 30 MK-I	12 Nos	13 Produced
HAWK	4 Nos	4 Produced
Do-228	5 Nos	5 Produced
ALH	24 Nos	24 Produced

2.7.6 Regarding major challenges being faced by the HAL, following was submitted to the Committee,

> "…It may be seen that all the presently placed orders will be liquidated by 2020-21. There are orders for LCA and HTT in pipeline as these proposals

have been cleared by DAC. These orders will last till 2024-25. Further the orders which are anticipated in future have also been shown which are likely to last up to 2026-27."

2.7.7 On the issue of lack of orders for HAL, the Ministry, in an oral submission, stated as under:

"For Tejas, we are giving orders which are in the pipeline. HAL is being given orders for another 83 aircrafts. They have already got the orders for 43 of them and another 83 will be sufficient for next 25-26 years."

2.7.8 When asked about the satisfaction with current organisational set up, HAL desired the Government to create a new post of Director (Corporate Planning and Business Development) to enhance organisational efficiency. They also requested for upgradation of pay scales of Officers in the Company based on the recommendations of the expert group constituted by the Government under the Chairmanship of Shri B.K Chaturvedi for restructuring and strengthening of HAL. The stated that proposals in this regard were submitted to the MoD to upgrade the pay scales of Executives on par with PSUs like BHEL/NTPC and the outcome is awaited.

2.8 Bharat Electronics Limited

2.8.1 BEL, a Navratna Company, was established in 1954. It has nine production Units spread across the country. The Units are located at Bangalore (Karnataka), Ghaziabad (U.P.), Kotdwara (Uttarakhand), Panchkula (Haryana), Pune (Maharashtra), Navi Mumbai (Maharashtra), Hyderabad (Telangana), Machililpatnam (Andhra Pradesh) and Chennai (Tamil Nadu). Besides, BEL has various Regional Offices at New Delhi, New York (USA) and Singapore. The company has two subsidiaries (BEL Optronic Devices Limited and and BEL-Thales Systems Limited) and one Joint Venture companies (GE BE Limited). BEL is setting up its Defence Systems Integration Complex at Palasamudram in Anantapur district of Andhra Pradesh to cater for expansion in upcoming business segments such as Missile Systems & Active Electronically Scanned Array (AESA)

Radars. It has core competencies in areas of Radars & Weapon Systems, Sonars, Communication, EWS, Electro-Optics and Tank Electronics. In Non-Defence sector, BEL's product range includes EVMs, Tablet PCs, Microcircuits, Semiconductors, Solar cells etc.

2.8.2 BEL has R&D facilities in all nine Units to achieve self-reliance. Company has made a 3 year R&D Plan identifying future programs & various technologies, Knowledge Management Portal etc. On an average 10 new products are introduced annually. BEL spends around 9% of its turnover on R&D.

2.8.3 Major achievements of BEL in 2016-17 were:

(i) Setting up of Advanced Night Vision Products Factory at Nimmaluru, AP commenced.

(ii) Firing trial for WLR successfully completed.

(iii) Secure CDMA Cellular Network (15 CESR) commissioned at Srinagar.

(iv) 8.4 MW Wind Energy Power Plant commissioned at Davangere (Karnataka).

(v) Awards won include Dun & Bradstreet India's Top PSU Award 2016, PSE Excellence Awards 2015, India Skill Award 2016, Karnataka Export Excellence Award 2014-15 etc.

2.8.4 As regards future challenges, competition has intensified, with the opening of Defence Electronics market to private participation. To combat competition, BEL has adopted various strategies like changes in organizational structure, enhanced thrust on New Product Development, Diversification, Improvement of Process, Infrastructure etc.

2.8.5 BEL has achieved around 80% of its turnover from indigenously developed products. Some of the major ones in recent past include 3D, L-band 2D Air & Coastal Surveillance Radars, Man-pack Satcom Terminal, Software Defined Radio, Advanced Composite Communication System, Citizen Verification Device, Integrated Sonar Suite for S3/S4 Platform, Integrated EW System for Mountainous Terrain, Laser Warning System and Gunner Sight for T90, Driver Sight for MBT Arjun/ Arjun Catapult.

2.8.6 BEL has been consistently investing in modernisation of facilities which is essential for successful indigenization efforts. The recent major investments include

facilities for Image Intensifier Tube Manufacturing, Near Field Test Range, EMI/ EMC Test Chambers, Super components Assembly/ Testing, Indoor/ Outdoor Test Platforms for Radars & Missile Systems etc. BEL will be investing around R500 crore towards CAPEX for 2016-17 through internal accruals.

2.8.7 When asked about reducing dependency on the imported items and achieving self reliance through indigenization, the Ministry of Defence (Department of Defence Production) in a written reply submitted :

> "BEL strongly believes in self reliance through indigenization. BEL does not import fully finished defence equipment. However, the company resorts to import of input material for the manufacture of defence equipment from foreign sources, only when indigenous sources are not available in the country. The company continues to make all efforts to further minimize the dependency on imports through several measures. Self-reliance in electronics can be achieved only when India sets-up a state-of-art foundry for making Integrated Circuits."

2.8.8 When enquired about the plans to encourage MSMEs for making 'Make In India' successful, the Ministry of Defence (Department of Defence Production) submitted that:-

> "Outsourcing has been recognized as one of the strategic tools to achieve cost benefits and also complement the strengths of private sector to build a strong industrial base. BEL has an exclusive Outsourcing and Vendor Development Policy to encourage Outsourcing. BEL's Purchase Procedure Manual has been updated with necessary clauses for procurement from MSEs and Start-ups. BEL has already complied with Public Procurement Policy for MSEs which mandates for minimum 20% procurement from MSEs…."

2.9 Bharat Dynamics Ltd. (BDL)

2.9.1 Bharat Dynamics Limited incorporated in the year 1970 under the MoD is a pioneer in manufacture of Anti-Tank Guided Missiles in the country. BDL is involved in manufacturing ATGMs of new generation, Surface-to-Air Weapon Systems (SAMs),

strategic weapons, launchers, underwater weapons, decoys and test equipment. BDL is fully geared up to meet demands of Armed Forces by capacity augmentation of all major projects.

2.9.2 BDL is putting determined efforts towards indigenisation of ATGMs with objective of increasing self reliance, reduction of foreign exchange out flow and cost reduction. Indigenisation of products like Konkurs-M, Invar and Milan-2T achieved upto 90%, 76.4% and 71%, respectively.

2.9.3 Rs 250 crore has been earmarked for year 2016-17 on CAPEX towards modernisation of Plant and Machinery and other infrastructure developments. BDL achieved record Sales turnover (net) of Rs 3785 crore in 2015-16. The sales target is set to exceed Rs 4400 crore in 2016-17.

2.10 BEML Limited

2.10.1 BEML Limited (formerly Bharat Earth Movers Limited) was established in May 1964 as a Public Sector Undertaking for manufacture of Rail Coaches & Spare Parts and Mining Equipment at its Bangalore Complex. The Company has partially disinvested and presently Government of India owns 54 percent of total equity and rest 46 percent is held by Public, Financial Institutions, Foreign Institutional Investors, Banks and Employees.BEML Limited, a 'Miniratna-Category-1', plays a pivotal role and serves India's core sectors like Defence, Rail, Power, Mining and Infrastructure. The Company started with a modest turnover of Rs. 5 crore during 1965 and today, thanks to its diverse business portfolio, the company has been able to achieve a turnover of more than Rs.3,500 Cr.

2.10.2 The Company operates under three major Business verticals viz., Mining & Construction, Defence and Rail & Metro. The three verticals are serviced by nine manufacturing units located at Bangalore, Kolar Gold Fields (KGF), Mysore, Palakkad and Subsidiary - Vignyan Industries Ltd, in Chikmagalur District. The products under Defence verticle include:

- Tatra based High Mobility Trucks
- Recovery Vehicles

- Bridge Systems
- Vehicles for Missile Projects
- Tank Transportation Trailers
- Milrail Wagons
- Mine Ploughs
- Crash Fire Tenders
- Snow Cutters
- Aircraft Towing tractors
- Aircraft Weapon Loading Trolley

2.10.3 Indigenization levels achieved by BEML are:

Mining & Construction products	-	90%
Rail products	-	90%,
Metro cars	-	65%.
Defence products	-	90%
High Mobility Vehicle	-	75%

[BEML website http://www.bemlindia.com/BEML_Indigenisation.aspx]

2.10.4 As regards outsourcing, the Committee have been apprised that BEML recognizes outsourcing as one of the strategic tools to achieve cost benefits and also complement the strengths of private sector to build a strong industrial base. BEML is well on its journey to become a system integrator by outsourcing a substantial part of manufacturing activities from Indian vendors, enabling BEML to enhance the capacity, attain cost effectiveness and improve competitiveness in the global market. As a policy BEML is not making any capital investments where facilities are available in the Indian industry. To facilitate outsourcing, the company has well established policies, procedures and guidelines.

- BEML has a Vendor Development Cell to work as a single window help desk for new vendors.
- New vendors can register through Online / Manual.
- New vendors are supported by way of imparting knowledge on manufacturing processes, specifications, quality plans, etc.
- BEML also extends its testing facilities to its vendors wherever required.

- To attract new vendors, BEML resorts to publishing of Expression of Interest periodically, participation in all vendor development programs organized by MSMEs, CII, FICCI and other agencies.
- To enhance transparency in all its procurement processes, BEML has well established eProcurement Portal.

2.10.5 Make in India Initiative: BEML is setting up 'Make in India' Display Centre at Bangalore Complex, where prospective vendors can have access to samples, drawings and technical specifications. Interested vendors can visit the facility to explore opportunities to partner with BEML.

2.11 Mishra Dhatu Nigam Limited (MIDHANI)

2.11.1 MIDHANI is a prime specialized metal and metal alloys manufacturing “Mini Ratna Category–I" company set up on the 20th day of November 1973 to manufacture critical materials required in the strategic sectors of India's defence industry and for sectors like nuclear power, satellite launch vehicles, aircraft etc. MIDHANI started commercial production in 1983 and has since then successfully supplied special metals and alloys to customers.

2.11.2 R&D activities at MIDHANI involve development of new alloys and products. R&D activities also involve identifying new areas/ customers/ product development. MIDHANI has signed MoU with SAIL/ RDCIS, BHEL/ Corporate R&D & NTPC/NETRA and discussions with Indian Railways are also in progress for developing new products. MIDHANI has also signed MoU with IIT Roorkee, IIT Gawahati and IIT Kanpur to work in areas of expertise of their respective institutes. Technology Advisory Board (TAB) of knowledgeable and experienced scientists/ engineers/ persons of repute has met and discussed the future course of R&D.

2.11.3 Most of the alloys/ products manufactured in MIDHANI are import substitutes and by employing in-house experience, MIDHANI has also reverse engineered many critical alloys/ products. A number of alloys/products have been successfully developed in-

house. Some of the recently developed products are MDN465 precipitation hardening stainless steel bars, Superni 740 H for Advanced ultra super critical programme hot rolled bars and wires, Superni 750 MW for semi-cryo engine and Titanium alloy Ti26 forging for Adour engine.

2.12 Mazagon Dock Shipbuilders Limited (MDL)

2.12.1 Mazagon Dock Shipbuilders Limited (MDL) is a leading Shipyard amongst Defence PSU Shipyards, engaged in construction of Warships and Submarines. MDL is presently constructing Missile Destroyers, Stealth Frigates and Submarines in order to achieve self-reliance in warship production for the Indian Navy.

2.12.2 It has following Commissionings and Launchings: Third ship of P15A, INS Chennai, commissioned on November 21, 2016. Second ship of P15B, Mormugao, launched on September 17, 2016. Second submarine of P75, Khanderi, launched on January 12, 2017. The first submarine of P75, Kalvari, is undergoing sea trials and is being readied for delivery to Navy.

2.12.3 Following R&D initiatives were undertaken:

- Rs 35.60 crore has been spent on R&D activities as on December 31, 2016.
- Established Shore Integration Facility to provide an environment ensuring the integrity of the equipments;
- HVAC layouts in 3D environment to ensure consistency in order to avoid interference in the design;
- ergonomics in ship detailed design;
- 3D CAD modeling of Block to envisage the efforts involved in modeling mega blocks for modular construction.

2.12.4 For modernisation, Submarine Assembly Workshop inaugurated on May 28, 2016, has been developed as a second assembly line for submarines. Track of Goliath Crane has been extended. Deepening of Ritchie Dry Dock and channel has been planned to overcome the draught constraint.

2.12.5 As for indigenisation, MDL has set up dedicated Indigenization department and has “Make-In-India” webpage linked to MoD’s website. Seven major items have been indigenised. Procurement Manual revised to include indigenisation Clause. Participated in and organised various seminars and exhibitions for spreading awareness and encouraging Indian vendors. Over the years, percentage of indigenisation in shipbuilding in MDL has increased from 42% (Delhi Class) in 1997 to 78% (Kolkata Class) in 2016.

2.12.6 Regarding productivity of the MDL, an expert while deposing before the Committee submitted that:

> “If we see the productivity of Mazagaon Dock in context of Asia and in global context, the reality is that the productivity is roughly about 50% of the global or regional norm. The destroyers take almost 5 years here whereas the same kind of vessels can be produced in 2-2.5 years.”

When asked about the comments of the Department on the aforesaid observation of the expert, the Department has stated as under:-

> “There are no established global productivity norms for our products i.e. warships and submarines. Defence products are mostly custom built and differ drastically in weapons & sensors packages. Average construction period taken by global shipyards is between 64 to 80 months depending upon the complexity and size of the warships.
>
> Further, due to the several productivity measures taken recently by MDL, the average build period is expected to come down from earlier 88 months (PI5A Destroyers) to 72 months (P15B Destroyers). In the earlier warships built for Indian Navy by MDL, following points having bearing on productivity are relevant:-

(a) Delay in receipt of vital weapons, sensors and certain propulsion machineries from suppliers abroad for various reasons. These equipment were not available indigenously.

(b) Delay in receipt of warship building steel from foreign sources.

(c) Many equipment are nominated by Navy to suit design parameters and commonality. A few of these, equipment were under R&D and took unduly long time for the supply.

(d) The ancillary industry in the country was in its nascent stages and took much longer than the anticipated time for developing equipment/systems.

(e) Unavoidable modifications by customer, for improving operational capability, after commencement of production leading to rework and delays.

However, following measures have been instituted to overcome the shortcomings observed during the earlier built ships and also to improve the productivity and reduce the build periods:-

(a) Development of most weapons and sensors is being expedited through DRDO and DPSUs. Through various routes such as 'Buy and Make', 'Buy an Make(Indian)' and 'Make' acquisition process.

(b) Indigenization of warship building steel has been undertaken through DPSU and Private Industries.

(c) New technologies for ship building such as integrated/modular construction has been incorporated in new projects.

(d) MDL has also successfully completed the augmentation of its infrastructure through Mazdock Modernization Project (MMP) which comprises of a new Wet Basin, a Heavy Duty Goliath Crane, a Module Workshop, a Cradle Assembly Shop, Store Building. Submarine Sub Assembly Shop and associated ancillary structures.

(e) MDL has developed new parallel lines of construction of submarines and also another warship construction facility at Nhava Yard.

(f) In addition, large scale outsourcing is being resorted to for parallel construction of part of ships at different geographical locations.

2.13 Garden Reach Shipbuilders And Engineers Ltd. (GRSE)

2.13.1 Garden Reach Shipbuilders and Engineers Ltd. (GRSE), a Mini Ratna Category-I Company, is a profit making and dividend paying DPSU for the last 23 years. It has kept pace with India's expanding maritime interests and is established as a leading Shipbuilding yard.

2.13.2 Presently, 19 warships are under construction in GRSE which include three stealth frigates, two Anti-Submarine Warfare Corvettes, seven Landing Craft Utility (LCU) ships, two Water Jet Fast Attack Crafts (WJFAC) and five Fast Patrol Vessels. Four warships were delivered to Indian Navy (three WJFACs and one LCU) and three warships were launched till December 31, 2016 (one WJFAC and two LCUs).

2.13.3 The Shipyard has been modernised to implement modular shipbuilding in construction. The modernized 'Diesel Engine Assembly Shop' of Diesel Engine Plant, at Ranchi was inaugurated in April, 2016.

2.13.4 R&D/ Indigenisation: GRSE achieved almost 93% indigenisation content in production during the period upto December 31, 2016. Further, a 'Display Room' has been set up for exhibiting/ showcasing indigenized / to be indigenized items. GRSE has also created a 'Make in India' cell to boost indigenization and detailed information is available on GRSE's website.

2.14 Goa Shipyard Ltd. (GSL)

2.14.1 Goa Shipyard Limited (GSL) is a Mini Ratna, Category-I company, capable of inhouse design and building sophisticated high technology warships for Indian Defence Forces and other varied clients, including Export markets. GSL is the largest exporter of ships from Indian subcontinent and has achieved excellent results on all fronts.

2.14.2 GSL has delivered two 105M Offshore Patrol Vessel (OPV) to Indian Coast Guard, one Fast Patrol Vessel & 11 Fast Interceptor Boats for Government of Mauritius and one Damage Control Simulator for Myanmar Navy ahead of contractual schedule. Three OPVs (two for Indian Coast Guard & one for Sri Lankan Navy) were launched in the year.

2.14.3 Under Make in India Initiative, GSL has been selected as Production Agency for indigenous construction of 12 Mine Counter Measure Vessels (MCMVs) under 'Make in India' initiative. Towards this end, yard is creating specialized infrastructure to build these state of-the-art ships, first time in the country. Accordingly, Yard 'Infrastructure Augmentation Plan for MCMV' is being executed in four phases, of which Phase 1 & 2 have since been completed in March 2011. The work on Phase 3A, commenced in January 2013, has been completed in August 2016 and was inaugurated by Prime Minister on November 13, 2016 during the function held at Goa.

2.14.4 R&D Activities: As part of development of product for future requirements of Navy, GSL has developed design of Advanced ASW Shallow Water Crafts. Further an improved design for 50M Fast Attack Platform with new propulsion configuration to achieve better fuel efficiency and enhanced endurance is under development. GSL also carried out the development of a Training Ship and delivered it to Indian Coast Guard, in August 2016. The First of the class in-house design of the latest Naval Offshore Patrol Vessel for the Sri Lankan Navy was launched in June 2016 and is due to be delivered in mid-2017. The First of the Class of newly designed export Water Jet Fast Patrol Vessel was delivered to the National Coast Guard of Mauritius in September 2016.

2.15 Hindustan Shipyard Ltd. (HSL)

2.15.1 Hindustan Shipyard Ltd. is the largest and strategically located shipyard under MoD (DDP). Since its inception, the yard has built 178 vessels and repaired 1949 vessels for Defence and Maritime Sector.

2.15.2 HSL is celebrating Platinum Jubilee on completion of 75 years of its existence in 2016. Coincidentally, in the FY 2015-16, significant achievement has been made by

posting a net profit of R 19 crore without any financial grant from the Government. Also, the income and VoP earned are the second and third best respectively since inception of the company.

2.15.3 The nation's prestigious project (VC 11184) was floated out on April 25, 2016 at an impressive ceremony. During the year, HSL has delivered 3 Nos. 25T Tugs to Indian Navy and one IPV, 'ICGS Rani Gaidinliu' to Indian Coast Guard. It is worth mentioning, that the IN tugs 'Balwan' and 'Sahayak' were built in a record time of 10 months from the date of keel laying for meeting the requirements of International Fleet Review 2016.

2.15.4 Research & Development: HSL has a well-equipped Design department which has been recognized as an in-house R&D unit by Department of Scientific & Industrial Research (DSIR), Ministry of Science & Technology (Letter of recognition and certification of registration have been issued by DSIR on March 30, 2016).

2.15.5 To promote import substitution, purchase preference clause has been introduced for Indian vendors. Certain items were earmarked ICGS Rani Gaidinliu for procurement only from MSMEs and Start-ups.

2.15.6 Modernisation of the existing infrastructure and facilities is being carried out expeditiously with the fund sanctioned by Government of India under LPD project. Besides, HSL is expected to be nominated for taking up shipbuilding projects of strategic nature under Government of India's agreement with Republic of Korea.

2.16 Synergy between Armed Forces and DPSUs in Defence Hardware Production

2.16.1 The Ministry submitted following written information regarding production of defence hardware being undertaken/proposed in the DPSUs:

Sl. No.	**Major Items**	**Contract details**			**Order received**	**Delivery made**	**Deliveries due**
OFB							
		Indent Qty.	Date	Customer			
1	Stallion	4572	23.12.15	DGOS	4572	3794	778
		4569	11.11.16	DGOS	4569	0	4569
2	LPTA	1999	07.10.15	DGOS	1999	1999	0
		2226	26.12.16	DGOS	2226	412	1814
3	T-90 Tanks	300	02.01.04	DGOS	300	282	18
		236	26.12.13	DGOS	236	6	230
4	BMP II & IIK	236	12.11.09	DGOS	236	235	1
		153	14.03.11	DGOS	153	37	116
		149	17.02.16	DGOS	149	0	149
5	7.62 MM MAG	403	07.11.12	DGOS	403	403	0
		186	26.02.15	DGOS	186	59	127
		205	09.02.16	DGOS	205	0	205
6	105 MM LFG with CES	151	22.07.15	Army	151	49	102
		4	04.03.15	Navy	4	4	0
		5	19.08.16	Navy	5	0	5
HAL							
1	Su-30 MKI	222	Jan 2001	IAF	222	181	41
2	Hawk	57	July 2010	IAF & Navy	57	57	-
3	Light Combat Aircraft – Tejas (IOC	20	Mar 2006	IAF	20	3	17

	Configuration)						
4.	Light Combat Aircraft - Tejas(FOC Configuration)	20	Dec 2010	IAF	20		20
5.	Dhruv-ALH	159	Dec 2007	IAF/Army	159	110	49
6.	Dhruv-ALH	32	Mar 2017	Navy/CG	32	-	32
7	Do- 228 Aircraft	14	Feb 2015	IAF	14	10	4
8	Do- 228 Aircraft with FIS	2	Feb 2016	IAF	2	-	2
9	D0-228 Aircraft	12	Dec 2016	Navy	12	-	12
10	AL 31 FP (Engines for SU-30 MKI)	113	Dec 2016	IAF	113	10	103
GRSE							
1.	Project-28 Anti-Submarine Warfare Corvette	04	Jun 2012	Indian Navy	04	02	02
2.	WJFAC Water Jet Fast Attack Craft	04	Mar 2013	Indian Navy	04	03	01
3.	LCU Landing	08	Sep 2013	Indian Navy	08	1	07

	Craft Utility						
4.	Project - 17A Stealth Frigate	03	Feb 2015	Indian Navy	03	-	03
5.	FPV Fast Patrol Vessel	05	Mar 2016	Indian Coast Guard	05	-	05
MDL							
1.	Project P75 Submarines	06	Oct 2005	Indian Navy	06	-	06
2.	Project P15B Destroyers	04	Jan 2011	Indian Navy	04	-	04
3.	Project - 17A Stealth Frigate	04	Feb 2015	Indian Navy	04	-	04
4.	Project P15A Destroyers	03	June 2008	Indian Navy	03	03	-
HSL							
1.	53,000 Ton Bulk Carrier	05	Apr 2005	M/s Goodearth Maritime Limited	05	04	01
2.	IPV Inshore Patrol	05	Mar 2006	Indian Coast Guard	05	04	01

	Vessels						
3.	Support Vessel	01	Feb 2013	Indian Navy	01	-	01
4.	25 Ton Bollard Pull Tugs	03	Dec 2011	Indian Navy	03	03	-
5.	10 Ton Bollard Pull Tugs	06	Nov 2012	Indian Navy	06	-	06
6.	50 Ton Bollard Pull Tugs	02	Mar 2011	Kandla Port Trust	02	01	01
BEL							
1.	HHTI with LRF	4025	Mar-2016	Army	4025	2577	1448
2.	Schilka Upgrade	48	Mar -2011	Army	48	13	35
3.	Lorros Mast	120	Mar-2011	Army	120	91	29
4.	3D Tactical Control Radar (3D TCR)	29	Mar-2011	Army	29	29	Fully Supplied
5.	Radio Relay Frequency (RRF) LB	500	Dec-2016 (BPC date)	Army	500	495	5
6.	L70 Gun Upgrade	200	March 2015	Army	200	71	129
7.	Weapon Locating Radar	30	Dec-2015	Army	30	8	22

8.	Hull Mounted Sonar (HUMSA 3G)	6	Jan-2013	Navy	6	5	1
9.	Ship Borne EW System (Varuna)	18	March-2014	Navy	18	06	12
10.	Fire Control System (Lynx U2)	20	July-2010	Navy	20	16	4
MIDHANI							
1.	MDN 172		27 Jan 2016	MSF, OFB Kolkata	Delivery completed in March, 2017		
2.	Titan 26		28 May 2014	HAL (F&F), Bangalore	Delivery is to start by May, 2017		
3.	MDN 250		12 feb 2016	VSSC,(ISRO)	Delivery has commenced		
4.	MDN 250		15 feb 2016	ASL,(DRDO)	Delivery has commenced		
BDL							
1.	Akash Missiles	2040	23 Mar 2011	Indian Army	2040	968	1072
2.	GSE(Ground Support Equipment)	332	23 Mar 2011	Indian Army	332	234	98
3.	Invar ATGM	15000	19 Aug 2013	Indian Army	15000	4850	10150
4.	Milan - 2T ATGM	5000	08 Mar 2016	Indian Army	5000	3463	1537
5.	Konkurs-M ATGM	15140	28 Mar 2008	Indian Army	15140	15140	-
BEML							

1.	TATRA 8X8	120	10.03.2011	MoD	120	91	29
2.	BEML TATRA (AKASH AIRFORCE)	36	21.06.2011	BDL, Hyderabad	36	36	0
3.	BEML TATRA for AKASH ARMY	88	25.10.2011	BDL, Hyderabad	88	88	0
4.	BEML TATRA AKASH ARMY	68	25.10.2011	BDL, Hyderabad	68	68	0
5.	BEML TATRA AKASH ARMY	116	30.11.2011	BEL, Bangalore	116	116	0
6.	BEML TATRA 3D-TCR	56	09.02.2012	BEL, Ghz	56	56	0
7.	SARVATRA	22	26.03.2012	MoD	22	1	21
8.	BEML TATRA 8X8 Vehicle AKASH ARMY	51	08.05.2012	BEL, Ghz	51	51	0
9.	COMMAND POST VEHICLE	43	10.12.2015	MoD	43	0	43
10.	BEML TATRA 8*8	1	21.12.2015	VRDE, Ahmednagar	1	1	0

	Vehicle (JD-DEFLECTOR)						
11.	RR 6*6 Vehicle (5MTR-SHORT SPAN BRIDGE SYSTEM (SSBS))	18	27.02.2016	L&T	18	2	16
12.	BEML TATRA (LOW LEVEL TRANSPORTABLE RADAR (LLTR)	52	04.06.2016	BEL, Ghz	52	30	22
13.	BEML TATRA (SWATHI)	109	21.06.2016	BEL, B'lore	62	32	30
14.	BRAHMOS AIRFORCE	2	03.12.2010	Brahmos	2	2	0
GSL							
1.	OPV Offshore Patrol Vessels	06	May 2012	Indian Coast Guard	06	04	02
2.	OPV Offshore	05	Aug 2016	Indian Coast Guard	05	00	05

	Patrol Vessels						
3.	FPV Fast Patrol Vessels	2	May 2014, Aug 2014	Govt. Of Republic Of Mauritius	2	1	1
4.	OPV Offshore Patrol Vessels	2	Feb 2014	Sri Lankan Navy	2	0	2
5.	1000T Fuel Barges	4	June 2015	Indian Navy	4	0	4

Value of Production of DPSUs

Rs. in Crore

Value of Production				
	2013-14	**2014-15**	**2015-16**	**2016-17**
HAL	15867	16288	17272	17514
BEL	6127	6659	7791	9165
BEML	114.50	118.58	397.20	764.01
BDL	1804.5	2770	4072	5014
MIDHANI	572.26	648.37	723.73	836.65
GSL	508.90	569.55	725.96	1020
MDL	2865.51	3592.60	4169.64	3510
HSL	453.40	294.16	593.36	601
GRSE	1611.67	1612.66	1707.00	936.70
OFB	11,123	11,364	13,077	14771
Total	**41047.74**	**43916.92**	**50528.89**	**54132.36**

R & D Expenditure of DPSUs

Rs. in Crore

R&D Expenditure				
	2013-14	**2014-15**	**2015-16**	**2016-17**
HAL	1083	1042	1182	1195
BEL	467	549	671	700
BEML	-	0.41	10.90	14.85
BDL	19.89	22.72	21.52	18.37
MIDHANI	7.97	8.45	24.21	8.62
GSL	3.71	8.95	7.23	8.95
MDL	47.56	57.88	63.84	66.45
HSL	6.48	5.04	5.93	6.00
GRSE	14.317	13.82	14.79	11.00
OFB	42.70	55.82	85.00	70.30
Total	**1692.627**	**1764.09**	**2086.42**	**2099.54**

* Revised figures submitted by the Ministry in July 2018.

Supply of Ammunition to Army by the OFB

Indent 2014-19 **Rs.26,475/-**
Delivered till March, 17 **Rs.12,919/-**

Year	**OFB Plan Cuml (a)**	**Acutal (b)**	**% cum achievement (b/a)**
2014-15	**4268**	**3970**	**93**
2015-16	**8963**	**8818**	**98**
2016-17	**14174**	**12919**	**91**
2017-18	**19958**		
2018-19	**26475**		

Efficiency improvement in OFB & DPSUs has increased by 35% in last 03 years.

Year	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Turnover/employee	**26 lakhs**	**28 lakhs**	**33 lakhs**	**35 lakhs**

2.16.3 With respect to productivity of MDL, one of the experts deposed before the Committee as under:\

" सबसे पहले मझगांव डॉक की जो प्रोडक्टिविटी को एशिया के कंटैक्स्ट में देखें या ग्लोबल कंटैक्स्ट में देखें, तो the reality is that the productivity of Mazagon Dock is roughly about 50 per cent of the global or regional norm. जहाँ तक डेस्ट्रॉयर्स की बात कर रहे हैं, यहाँ पर करीब पाँच **वर्ष** लग जाते हैं। लेकिन वहाँ पर उसी प्रकार का जहाज दो-ढाई **वर्ष** में ही बनाते हैं। So, we need to accept that, improve that. About orders, I am a bit surprised as you are saying that hull section is now unemployed. I am very surprised to hear that. I did not know this. As an analyst I thought that our shipyards actually are unable to cope with the existing orders. यह मैं बार-बार नेवी और कोस्ट गार्ड से सुनता हूँ। "

In response, the Ministry informed as under:

"Mazagon Dock Shipbuilders Limited (MLD)

There are no established global productivity norms for our products i.e. warships & submarines. Defence products are mostly custom built and differ drastically in weapons & sensors packages. Average construction period taken by global Shipyards is between 64 to 80 months depending upon the complexity & size of the warships.
Further, due to the several productivity measures taken recently by MDL, the average build period is expected to come down from earlier 88 months (P15A Destroyers) to 72 months (P15B Destroyers). In the earlier warships built for Indian Navy by MDL, following points having bearing on productivity are relevant:-

(a) Delay in receipt of vital weapons, sensors and certain propulsion machineries from suppliers abroad for various reasons. These equipment were not available indigenously.
(b) Delay in receipt of warship building steel from foreign sources.
(c) Many equipment are nominated by Navy to suit design parameters & commonality. A few of these, equipment were under R&D and took unduly long time for the supply.

(d) The ancillary industry in the Country was in its nascent stages & took much longer than the anticipated time for developing equipment/systems.
(e) Unavoidable modifications by customer, for improving operational capability, after commencement of production leading to rework and delays.

However, following measures have been instituted to overcome the shortcoming observed during the earlier built ships & also to improve the productivity and reduce the build periods:-

(a) Development of most weapons and sensors is being expedited through DRDO and DPSUs. Through various routes such as 'Buy and Make', 'Buy and Make (Indian)' and 'Make' acquisition process.
(b) Indigenization of warship building steel has been undertaken through DPSU and Private Industries.
(c) New technologies for ship building such as integrated / modular construction has been incorporated in new projects.
(d) MDL has also successfully completed the augmentation of its infrastructure through Mazdock Modernization Project (MMP) which comprises of a new Wet Basin, a Heavy Duty Goliath Crane, a Module Workshop, a Cradle Assembly Shop, Store Building, Submarine Sub Assembly Shop and associated ancillary structure.
(e) MDL has developed new parallel lines of construction of Submarines and also another warship construction facility at Nhava Yard.
(f) In addition, large scale outsourcing is being resorted to for parallel construction of part of ships at different geographical locations."

2.16.4 With regard to outsourcing and vendor development policy, the Secretary (Defence Production) during oral submission to the Committee stated as under :-

"we have come out with the outsourcing and vendor development policy. We are encouraging the PSUs that they ultimately should move towards integrators. They should not manufacture everything in House. If you see trend world-wide, normally in these big companies, their value addition is only in the range of 35 to 40 or less than that itself and they outsource everything and that is how the entire eco-system gets developed in terms of tier one and tier two and tier three. So, this item is regularly monitored as to what is the percentage of outsourcing by the various PSUs. At present, we do not have the big vendors. In fact we have got the small vendors. If you take the HAL, they have got the base around 3000 vendors and mostly, they are small vendors. We are telling them that they must move towards the larger vendors where they can make the systems they can integrate with the result their turnover will go up very fast. Because their labour is very costly, manufacturing cost is very high, so they must outsource and then only, their production, turnover and everything will go up very fast. For SMEs, the Government of India has come out with the notification and that is applicable

even to the DPSUs also that 20 per cent of the orders, they must place the small and medium enterprises."

He further added that:

"They are doing. So, now our entire thrust is how to implement the guidelines on outsourcing and vendor development we have come up with. Infact, we are saying, they even we can set up the facilities and lease those facilities to the small vendors because they may not be able to invest money also. So, we have come out with the comprehensive policy because this is a very important area under 'Make in India'. They are also holding the vendor meet." (V pg-55-56)

2.16.5 It was also brought to the notice of the Committee that in order to encourage the small private Industries, BEL is letting out its test facilities and listed on their website the list of about 70-80 test facilities available across the various units which are available on rent to private industry as part of hand holding the industry.

2.16.6 As a result of outsourcing and vendor development guidelines issued by the Department, outsourcing has shown upward trend in past 3 years.

Year	2013-14	2014-15	2015-16	2016-17 (upto Dec, 2016)
% of value of Outsourcing/Value of Production	34	36	37	41

2.16.7 Various experts during the course of deposition before the Committee referred to the shortage of various defence equipments. In this regard, the Ministry submitted as under:-

" The Modernisation of the Armed Forces is an ongoing process, executed in consonance with the road map laid down in the Long Term Integrated Perspective Plan (LTIPP), and is being carried out by continuous upgradation of the existing equipment and induction of new weapon platforms and systems, based on envisaged capabilities, threat perception, prevailing external security environment, obsolescence management, emerging technologies and availability of funds.

2. The Government regularly reviews the security scenario and accordingly decides to induct appropriate defence equipment based on operational requirements. Deficiencies vis-à-vis the assessed requirements are continually addressed by procurements as per laid down procedures."

Chapter 3

Procurement

3.1 Defence Procurement Procedure (DPP-2016)

With respect to the Defence Procurement Procedure, the Ministry submitted as under:

"The Defence Procurement Procedure (DPP) – 2016 has been promulgated and has come into effect from 1.4.2016.

The DPP 2016 focuses on institutionalizing, streamlining, and simplifying defence procurement to give a boost to 'Make in India' initiative of the Government of India, by promoting indigenous design, development and manufacturing of defence equipment, platforms, systems and sub-systems. 'Make' procedure has also been refined to ensure increased participation of the Indian industry. Enhancing the role of MSMEs in defence sector is one of the defining features of DPP. Cutting down permissible timeframes for various procurement activities, and institutionalizing robust mechanisms to monitor for probity at various stages of the procurement process, are the cornerstones of DPP. Some of the changes in this direction include :-

(i) A new category of acquisition has been introduced - Buy Indian (IDDM), to promote indigenous design development and manufacturing. Under this category, indigenously designed equipment with 40% indigenous content (IC), or equipment with 60% IC will be considered for acquisition. This category will be the most preferred acquisition category, above the existing 'Buy (Indian)' category.

(ii) 'Buy (Indian)' category of acquisition requires a minimum IC of 40% as against 30% in DPP 2013.

(iii) Parameters of SQR have been classified as Essential Parameters A and B. Essential Parameters 'A' are a part of the contemporary equipment available in the market. Essential Parameters – B are those parameters which can be developed and achieved by the vendors using available technologies.

(iv) SQRs will also have Enhanced Performance Parameters, to provision for additional capabilities over and above the

essential parameters; vendors meeting the same will be given additional weightage during evaluation of their product cost.

(v) Offset obligations will be required only in cases where the cost of the contract is more than Rs. 2000 crores.

(vi) Provisions for involving private industry as Production Agencies and Technology Transfer Partners have been incorporated.

(vii) Validity of AoN has been reduced to 6 months (from 1 year) for 'Buy' cases and to 1 year (from 2 years) for 'Buy & Make (Indian) cases. Moreover, draft RFP has to be submitted alongwith proposal seeking AoN.

(viii) Single vendor cases at the bid submission stage, TEC stage and Evaluation stage will not be automatically retracted and could proceed with due justification.

(ix) Preamble has been introduced to serve as the guiding principle for the DPP.

(x) Make procedure now has two sub categories – Make - I (Government funded), Make – II (Industry funded).

(xi) Make - I (Government funded) – involves 90% (against the 80%) funding of the development cost, by the Government. Further, provision for mobilisation advance has been introduced.

(xii) Make - II (Industry funded) - involves prototype development by the industry.

(xiii) A dedicated Project Management Unit will be constituted at the Service Head Quarters level, which will be responsible for driving all Make projects pertaining to the respective services."

3.1.2 Queried about the experience of Ministry of Defence with the DPP 2016 during the last one year, the Ministry in a written reply that:

"Defence Procurement Procedure (DPP) - 2016 favours swift decision making, provides for suitable timelines and delegates powers to the appropriate authorities to ensure an efficient and effective implementation of the procurement process, by all stakeholders concerned. further the Government is committed to the goal of achieving self-reliance in our defence capabilities. Accordingly, the concept of 'Make in India' is a focal point of the current defence

acquisition policy and procedures. In order to achieve this objective, out of the Government approval to 34 capital procurement cases at an estimated cost of Rs. 1,02,338.45 Crore during 2016-17 and current Financial Year (up to 30.04.2017), 23 AoNs of Rs. 96,466.25 Crore value are 'Buy (Indian)'. 'Buy Indian- (Indigenously Designed & Developed Manufactured (IDDM)' and 'Make' categories.

During the same period, 52 contracts involving Rs. 1,24,465.57 crore have been signed for the capital procurement of defence equipment including aircraft, helicopters, missile, artillery guns and simulators."

3.1.3 Further queried about the delay in notifying the Strategic Partnership Chapter in DPP-2016, the MOD gave written reply that:-

"The policy and criteria for selection of Strategic Partners has been finalized with the approval of the Defence Acquisition Council. The policy and criteria have been encapsulated into Chapter VII of the Defence Procurement Procedure, 2016 which has since been uploaded on MoD's website (www.mod.nic.in)"

3.1.4 While deposing before the Committee, the Secretary (DP) further stated to the Committee in an oral submission that:-

"We have brought strategic Partnership policy because we want to develop certain private units as our strategic partners, but at the time of issuing AoN for any platform, we will look into the capacity and capability of the DPSU also. What I am saying is that the general policy is that the capacity of the PSUs will be looked into while deciding about procurement of any platform. That is a part of the strategic partnership policy."

As per DPP2016, FDI upto 49 % has been permitted automatically with upto 100% permitted through government approval, whereas it is likely to result in access to modern technology and to other reasons recorded. Further as per the draft DPP Policy, 2018, FDI regime in defence would further be liberalised and FDI upto 74 % under automatic route would be allowed in niche technology areas. Other initiative would also be taken to promote the involvement of private sector and MSMEs in defence sector.

As per Preamble to Defence Production Policy-2018, Indian has become one of the largest importers of defence goods and services in the world. As per Stockholm International Peace Research Institute (SIPRI) data, India's share in global arms imports is 12.8%."

3.2 Delay in Procurement

3.2.1 When queried about the immediate requirements of equipments and weapons systems and platforms, a representative of the MOD deposed before the Committee:-

> "For equipment weapon systems and platforms, the requirement is guided by LTIPP, Long Term Integrated Perspective Plan. It is for the Army, Navy and the Air Force. It is 15 year perspective plan. So, the requirement flows out of that. So, there are three routes available to equip the armed forces with the modern weapon systems. One is development, followed by production if time is available. Second, production through transfer of technology, if urgently required and volumes are there. Third is through direct import if operational requirements are urgent and volumes are small. This requires a lot of coordination and synergy between R&D Wing, Procurement Wing and the Production Wing. With increased thrust on self-reliance, we are ensuring now that every proposal is examined properly threadbare and to see whether it can be manufactured in India or not and then only we resort to import. DPP procedure also has been accordingly modified where 'Buy Indian' and 'Buy & Make Indian' categories have been given the highest categorisation. That is why in the last one and half years, 90 per cent of the proposal which have been cleared by the DAC, by value, have been categorised under 'Buy Indian' and 'Buy & Make Indian'. Though the turnover of the DPSUs and OFBs going up, considering the increased demand from the Forces, there is definitely a space for the private sector in the defence manufacturing. That is why a number of initiatives have been taken to facilitate private sector manufacturing"

3.2.2 On being asked about the time taken in the procurement procedure and steps initiated to shorten the time taken in the procurement procedure, a representative of MoD submitted to the Committee in an oral submission that:-

> ''जो डिफेंस प्रॉक्योरमेंट प्रोसीजर इस साल बना था, उसमें कुछ कोशिश की गई है कि प्रोसीजर को शॉर्टेन किया जाए। मगर जो आप कह रहे हैं कि बहुत टाइम लगता है। कुछ केसेज़ में हमने भी यह एक्सपीरिएंस किया है कि बहुत टाइम लगता है। particularly at three stages. The first stage is the issuance of the request for proposal तो आर.एफ.टी. ड्ब्ल्यू को ठीक करने में थोड़ा सा टाइम लगता है। उसकी प्रथा अब शॉर्टेन कर दी गई है। Second stage is at the stage of field trials. That is the evaluation of the platforms because we need the requirement to work in mountains and plains, in winter and in summer. Sometimes for complex platforms like aircraft trials, it

may take even upto two years for complete trials. Third and most difficult stage is the contract negotiation stage. The amount of caution and diligence that needs to be required to satisfy…."

3.2.3 Explaining the reasons for delay in acquisition process, a representative of Ministry of Defence told the Committee that preference to indigenous products is also a reason for the same. While deposing before the Committee he stated that

"many times the acquisition process or the manufacturing process suffers because of delays as we want to indigenise many items. In the case of ship building, MDL, CMD has rightly pointed out that they have indigenised a lot of items in ship building activities. In the beginning we imported about 15 items but we have indigenised upto 9 to 10 items and we are importing just five items. So, the whole thrust of the procurement procedure is towards indigenisation. At times, the indigenisation is at the cost of delay. The cases where we can wait or we can innovate or we can indigenise the things, we take that route so that the defence industrial base of the country is improved."

3.2.4. Responding to a query on time and cost overrun of Defence Projects, Secretary (DP) submitted to the Committee in an oral evidence that:-

''जो कांट्रैक्ट हैं, वह फिक्स्ड प्राइस कांट्रैक्ट हो रहे हैं, उसमें टाइम एंड कॉस्ट ओवररन का कंसैप्ट नहीं है। अगर वे लेट करते हैं डिलीवरी **में** तों उन **पर** डैमेजेज़ लगते हैं। उसी डिसिप्लिन को लाने के लिए हमने फिक्स्ड प्राइस कांट्रैक्ट **कर** दिये हैं।"

3.2.5 Responding to a query regarding time and cost overruns of DRDO projects, the Ministry in a written reply stated:

" There has been delay in some of the DRDO projects. There are many causes due to ab-initio development; lack of availability of critical equipment, special materials indigenously as well as infrastructure and testing facilities in the country; mid-term revision in Qualitative Requirements; extended and repeated trials; non-availability of platforms for trials, etc. Delay in production of systems by designated production agencies and problems in absorbing high-end technologies by the production agencies are some other factors which adds to the delay in getting the product/system delivered to the services."

3.2.6 Queried about the lack of transparency in field trials resulting in the disqualification of weapons or ammunitions fairly well used across the world by many armies and hence resulting in single vendors, the MOD in a written reply on 20.08.2015 submitted that:-

> "Capital acquisition of equipment/weapons are based on Services Qualitative Requirements (SQRs). The SQRs are formulated considering peculiar operational, environmental and logistic requirement of Indian Army. These do not necessarily match with the technical specifications of the weapons being offered and their utilization in other armies of the world. During the last five years, nine contracts were concluded with Resultant Single Vendors, for the Army."

3.3 MSMEs in defence Sector

3.3.1 According to Stockholm International Peace Research Institute (SIPRI), India remained the world's biggest arms importer over the past five years, and increased its share of global arms imports from 9.7% in 2007–11 to 12.8% in 2012–16.

3.3.2 Under public procurement policies for MSMEs, a total of 20% share out of the total procurements by Central Government Ministries/Departments/ Public Sector Undertakings are to be procured from the MSMEs.

3.3.3 In a clarification on the assistance to MSMEs working in Defence Sector, the Ministry replied that:

"....Technology Development Fund (TDF) has been established to encourage participation of public/private industries especially MSMEs so as to create an eco-system for enhancing cutting edge technology capability for defence application. The scheme covers funding through grants to industry that may work in collaboration with the academia or research institutions to carry out innovation, research and development."

3.4 Defence Contract writing

3.4.1 Deposing before the Committee, a Defence Analyst stated that:-

> **"xxx xxx** The Price Negotiation Committee in the Ministry of Defence does not have the expertise in technology transactions. In America in the West writing contract is a majorly developed capability. We have great experience of buying but no experience of writing contracts that help us. We end up writing contracts that help the suppliers and the foreign countries."

MoD in this regard stated as under:-

> "As per standard composition of Contract Negotiation Committee (CNC), Acquisition Manager, Technical Manager, Finance Manager, Advisor Cost along with representatives of DGQA/DGAQA/DGNAL, User department and SHQs are nominated in CNC. No incident has come to the notice of the Government where the Indian interests were adversely impacted due to lacunae/loopholes in contract writing."

In this connection, HAL, in response to a query raised during informal discussion with the Committee during its study visit to Hyderabad, stated as under:

> "When the aircraft is manufactured under ToT, OEMs do not provide ToT for critical and high end technology items. In such scenario, HAL is dependent on OEMs for the entire life cycle of product including for upgradation of aircraft. In addition, HAL sources various components/ accessories/ systems from foreign OEMs for the indigenous programmes also, which is commonly followed by the aircraft manufacture worldwide. To avoid dependency on OEMs for the entire life cycle of the product, the Govt support would be required to ensure that comprehensive ToT is provided to the Indian manufacturer."

Chapter 4

Research & Development (R&D) in Defence Sector

As per the information furnished by the Ministry, R&D in Defence Sector in the Country is undertaken mainly through the Defence Research and Development Organisation (DRDO) although other DPSUs also have their R&D apparatus. Total fund availability for R&D in Defence Services in 2017-18 is Rs. 14818.74 crore while actual amount spent in 2016-17 was Rs. 13345.66 crore.

4.1 DRDO

4.1.1 DRDO was formed in 1958 from the amalgamation of the then already functioning Technical Development Establishment (TDEs) of the Indian Army and the Directorate of Technical Development & Production (DTDP) with the Defence Science Organisation (DSO). Over the years, it has grown multi-directionally in terms of the variety of subject disciplines, number of laboratories, achievements and stature. Today, DRDO is a network of more than 50 laboratories which are deeply engaged in developing defence technologies covering various disciplines, like aeronautics, armaments, electronics, combat vehicles, engineering systems, instrumentation, missiles, advanced computing and simulation, special materials, naval systems, life sciences, training, information systems and agriculture. Presently, the Organisation is backed by over 5000 scientists and about 20,000 other scientific, technical and supporting personnel. Several major projects for the development of missiles, armaments, light combat aircrafts, radars, electronic warfare systems etc are on hand and significant achievements have already been made in several such technologies.

4.1.2 Defence Research and Development Organisation (DRDO) is the country's leading organisation involved in design and development of indigenous Defence systems. The organisation has set its sights on making India self-sufficient in Defence equipments ranging from missiles, radars, sonars, electronic warfare, engineering systems, surveillance and recce systems, among others. DRDO is also looking at providing state-of-the-art communication systems, electro-optics,

night vision devices, information security products, naval & airborne weapons etc. Each of these has been developed using indigenous manufacturing and testing facilities to maximum extent.

4.1.3 DRDO has typically worked together with Ordnance Factory Boards (OFBs) and Defence Public Sector Undertakings (DPSUs) to build products/systems for the nation. However, DRDO has also drawn the Indian private sector into its fold both because of requirement and with the view to broadening India's defence industrial base. This is in sync with the Government's vision of 'Make in India' to transform India into a global manufacturing and innovation hub whose products become synonymous with superior quality and inspire confidence among global consumers.

4.1.4 DRDO labs are grouped into seven technology clusters namely, Aeronautical Systems (AERO), Armament and Combat Engineering Systems (ACE), Electronics and Communication Systems (ECS), Life Sciences (LS), Micro Electronic Devices and Computational Systems (MED & CoS), Missiles and Strategic Systems (MSS) and Naval Systems and Materials (NS&M). Each of these clusters function under cluster DGs. The seven DG offices are located at Bangalore (Aero and ECS), Pune (ACE), Delhi (MED & CoS and LS), Hyderabad (MSS) and Vishakhapatnam (NS&M).

4.1.5 DRDO also has three human resource institutions i.e. Centre for Personnel Talent Management (CEPTAM), Institute of Technology Management (ITM) and Recruitment and Assessment Centre (RAC). There are also three certification agencies under DRDO's fold, i.e., Centre for Military Airworthiness and Certification (CEMILAC) for airworthiness products, Centre for Fire Explosive and Environment Safety (CFEES) for fire and explosives and Scientific Analysis Group (SAG) for grading of information security products. These certification agencies provide services not just for DRDO but other organisations of Government of India as well. Additionally, Regional Centers for Military Airworthiness (RCMAs) under the aegis of CEMILAC are located at different stations all over the country. Four

research boards (Aeronautics, Naval, Armaments and Life Sciences) function under DRDO funding to provide thrust to basic research in academia in the areas of strategic importance.

4.1.6 In addition, Department of Defence R&D has one autonomous body viz. Aeronautical Development Agency at Bengaluru, one joint venture viz. BrahMos Aerospace at Delhi and one Deemed university viz. Defence Institute of Advance Technology (DIAT) at Pune.

4.1.7 DRDO has a total strength of 24,578 employees, out of which 7,410 are in Defence Research and Development Services (DRDS), 9,297 in Defence Research and Technical Cadre (DRTC) and 7,871 are in Administration and Allied Cadre.

4.1.8 During the current financial year 2016- 17, DDR&D has been allocated Rs. 13,593.78 crore (BE) which is about 5.5% of the total Defence Budget. A total of Rs. 6,865.73 crore has been allocated under Capital head and R 6,728.05 crore under Revenue head.

4.1.9 During the calendar year, 78 new projects have been sanctioned at a total cost of R 3,723 crore and 42 projects at a total cost of R 1,353 crore have been completed. DRDO currently has 291 ongoing projects (excluding strategic projects) amounting to approximately R49,030 crore (including User share). Out of 291 ongoing projects, 42 large projects (cost ≥ R 100 crore) have a cost of R42,643 crore (DRDO's share~ 70% of the total share).

4.1.10 When enquired about the funds for the R&D in cutting edge Defence Technologies during the last five years, the MoD in a written reply submitted as under:

> "Details of Forecast Budget Estimate (FBE) and Budget Allocations for the Dept. of Defence R&D at different budgetary stages and actual expenditure for the last five years and current financial year is as under:-

(Rs. In Cr.)

Year	BE Proposed	BE Approved	RE Approved	MA Approved	Actual Expenditure
2012-13	14463.66	10635.56	9841.93	9884.94	9794.80
2013-14	16483.28	10610.17	1930.17	10934.17	10868.88
2014-15	18495.46	15282.92	13447.19	13716.14	13257.98
2015-16	19641.56	14358.49	12491.21	13540.11	13277.27
2016-17	18782.86	13593.78	13454.54	13501.00	13345.66 (12th Corr)
2017-18	19935.60	14818.74			

All efforts would be made to utilize the allocations for the current financial in full and additional funds, if required, would projected at later stage. Though, it definitely would help us if full allocations are made at BE stage itself to facilitate prioritization of expenditure in various such Projects//Programmes.'

4.2 Performance of DRDO

With respect to the performance of the DRDO, the C&AG in its 2015 report stated as under:

> "Audit examination of 14 Mission Mode projects carried out by DRDO Laboratories revealed that all the projects failed to achieve their timelines and their probable date of completion (PDC) were extended many times. In five projects there were cost overruns as well. Further, although Operational Requirements / Qualitative Requirements / Broad Technical Requirements of IAF existed in all projects, the requirements of IAF were met to their satisfaction only in one completed project viz., S-band surveillance system project 'Rohini'. In the same project the technology was also transferred leading to its productionisation by BEL and final induction into IAF. The systems developed in other closed projects were yet to be accepted by IAF. The delays can be attributed to inadequate monitoring by different committees as well as to change of requirements by IAF (three projects). Lack of harmonisation (where multiple agencies were involved) was also noticed in two projects. The projects were therefore not carried out in spirit of Mission Mode which adversely affected Air Defence plans of IAF."

4.2.1 As reported in media, a high powered Committee constituted by the Ministry of Defence under Lieutenant General DB Shekatkar (Retired) in May 2016 recommended that as many as 11 laboratories of the DRDO need to closed down or amalgamated and its "non-core" research activities stopped. The

committee also said that DRDO needs to work with "clearly defined" objectives to develop "weapon systems and platforms".

4.3 Manpower in R&D

4.3.1 The MoD in a written reply submitted to the Committee that following steps are being taken to attract the scientists to join DRDO:-

> " DRDO was set up with the mandate of developing cutting-edge technologies and systems for the Indian Armed Forces through R&D in all technology domains. DRDO collaborates with other S&T organisations, like Department of Space (DoS), Department of Atomic Energy (DAE) and Council of Scientific and Industrial Research (CSIR) for common requirements and applications. DRDO has set up specialized centres of technology in select academic institutions of repute of work, e.g. IIT Madras Research Park. DRDO has also selectively chosen its global partners and has MoUs with over 30 countries worldwide for joint collaboration in requisite areas with complementary work share.
>
> We interact with think tanks such as IDSA, CLAWS, INMF, CAPS, NIAS, etc. and have awarded study projects to them which include Defence study in the areas of missiles and strategic systems, unmanned aerial vehicles, etc. DRDO have a structured methodology for interaction with the academia. CARS project (part of any main project) are being given to academic institutions for meeting the immediate requirements in a project.
>
> DRDO has Peer Review Committees (PRC) which are chaired by an eminent person (preferably from outside DRDO) having expertise in the area of the project. One of the main tasks of PRC is to come out with Project Evaluation and Assessment Readiness Level (PEARL) indices at the beginning of undertaking the project (at sub-system level and overall project level) and expected increase in these indices at the time of closure of the project. The Module Readiness Level (MRL) brings about analysis of what is going around the country and where we stand in comparison to the rest of the world.
>
> The Dte of ER & IPR is involved in funding academic institutions through various schemes; creation of Centres of Excellence in select academic institutions of repute to work in specific areas like propulsion, electromagnetic and robotic soldier; and also supports the instrumentality of Memorandum of Collaboration (MoC)/Memorandum of Understanding (MoU). MoCs have been entered with IISc, IIT and Jawaharlal Nehru Center for Advances Scientific Research to assist DRDO in ongoing projects at laboratories. DRDO has selectively chosen

its global partners and has MoUs with over 30 countries worldwide for joint collaboration in requisite areas with complementary work share.

Four Research Boards (Aeronautics, Naval, Armaments and Life Sciences) functioning under DRDO funding, provide thrust to basic research in academia in areas of defence importance.

The organisation has close interaction with academia and is actively involved in departmental research across the country.

Apart from this, seven Young Scientist Centers have been set up for the involvement of fresh minds and initiatives are on to build more centres. DIAT, Pune is the centre of excellence of international repute for education, training and research in advanced technologies with a view to strengthen national security and self reliance. The proposed Indian National Defence University (INDU) is expected to take up Defence studies in future.

DRDO has numerous strategies to attract piercing talent in order to overcome these problems. Scientists are recruited through ROSSA, Talent Search Scheme. Also, the organization has schemes to hire Junior and Senior Research fellows (JRF/SRF) as well as Research Associates (RAs) which nurtures talent and exposes them to research in the field of Defence.

Government also gives following incentives to attract scientists to joint DRDO:-

a) Promotions are made under merit based Flexible Complementing Scheme without linkage to vacancies.
b) Two additional increments are given to Scientist ‘C’ to Scientist ‘F’.
c) Special Pay of Rs. 4000 to given to Scientist ‘G’.
d) Upto 06 variable increments are given to scientists on promotion upto the level of Scientist ‘H’.
e) Professional Update Allowance in given to scientists upto the level of Scientist ‘G’.

Further in order to attract young talent, DRDO carries out exhibits in platforms like Indian Science Congress, Def Expo, Air Show, etc. where the DRDO products and achievements are broadcasted. Some leading periodic magazines, like ‘Week’ and ‘Outlook’ carry articles pertaining to technologies, R&D efforts and products of DRDO. The DRDO website www.drdo.gov.in is populated with monthly newsletter that provides a flavor of DRDO’s research efforts. It also provides a platform for the curious youngsters to know about job avenues in DRDO.

In order to percolate further, DRDO envisages a project to carry out technology exhibitions in schools and colleges to spread awareness and carve a yearning in the young brains of the country for joining DRDO."

4.3.2 When queried about the steps taken to attract talent and extract best performance from the Scientists in DRDO, the MOD gave the following written reply:-

"In order to extract best performance from the Scientists in DRDO, the department has a holistic Personnel Policy/Incentive Scheme to attract talent and incentivize their achievements.

So far as the promotions of scientists are concerned, they are made under a merit based Flexible Complimenting Scheme (FCS) provided in the DRDO rules, wherein promotions are based purely on merit without any linkage to availability of vacancies or seniority. Under the FCS, scientists recruited at the level of Scientist 'B', in the lowest rung of Gp 'A', can move up to the level of Scientist 'H' in level 15 (HAG Scale) and thereafter upto the level of Distinguished Scientist in the level 16 (HAG+scale) on personal up-gradation basis.

So far as incentives are concerned, earlier these used to be a parity in the same with ISRO/BARC, which were granted through a common Cabinet sanction dated 03rd Feb 1999. However, at present there is a disparity in the incentives as the Performance Related Incentive Scheme (PRIS), which has been implemented in ISRO/BARC, has not been granted to scientists in DRDO. The 7th CPC in its recommendations has not recommended PRIS for DRDO despite the same being in operation in ISRO/BARC."

4.3.3 When asked about the increasing attrition rate of Scientists in DRDO, following reply was submitted:

"As per the data collected by the 7th Pay Commission, as reflected in its report, the attrition rate, defined as the number of scientists resigning/taking VRS during a year as a percentage of total scientists on the payroll at the end of that year, has been on decline during the last few years partly due to PRIS and partly due to salary increase after VI CPC.

Attrition Rate of Scientists (percentage)

Years	DRDO

2010-11	0.87
2011-12	1.16
2012-13	0.93
2013-14	0.82
2014-15	0.53

4.3.4 When asked about the staff position of the Ordnance Factory Boards, the Ministry submitted in a written deposition as under:

"The category-wise strength in respect of Ordnance Factories Organization is furnished below: (As on 01.01.2018)

Category	Sanctioned Strength	Existing Strength
Industrial Employees (Including Labour)	102598	56975
Non-Industrial Employees, Paramedical & HQ Ministerial	20583	13725
Group B Non-Gazetted	12085	8940
Group B Gazetted	7256	6030
Group A	2981	1804
	145503	**87474**

Further, about shortage of officers, in the OFBs, the Ministry stated as under:

"With regard to the shortage/shortfall of Staff/Officers, it is hereby intimated that the sanctioned strength of Ordnance Factories is intended towards catering to peak load requirements of Indian Armed Forces while existing strength is maintained for meeting the current load of the Armed Forces on annual basis. The flexibility is required to help Indian Ordnance Factories to augment the manpower at a very short notice in times of exigency and to cater the workload from time to time.

However, Manpower is being sanctioned every year in respect of Gr.C [Industrial Employees (IEs) & Non-Industrial Employees (NIEs)] & Gr.B [Non-Industrial Employees (NIEs), Non-Gazetted Officers (NGOs) &

Gazetted Officers (GOs) categories of employees based on vacancies available in the recruitment grade and work load requirement. The manpower (Gr.B & C) sanctioned after April 2015 is as follows:

Category	**Month & Year**	**No. of posts sanctioned**
Industrial Employees (Gr. C)	May, 2015	4895
	May, 2016	4033
Non-Industrial Employees (Gr. B & C)	May, 2016	965
Non-Gazetted Officers (Gr. B)	July, 2016	846 (under review)
Gazetted Officers (Gr. B)	May, 2015	188
	July, 2016	127 (under review)
-	**Total**	**11054**
The total number of posts sanctioned to be filled after April 2015 is therefore 11054		

Also,

"The list of officers on deputation to various Ministries/Departments is as under. The deputations are being approved by the competent Authority as per the extant rules governing the deputation. Hence there is no proposal to recall the officers to make up the shortfall."

4.4 Interaction between Public Sector R&D and Industries and leveraging capabilities in other sectors

4.4.1 DRDO technologies are transferred to Indian industries/ DPSUs/ OFBs as per the 'Guidelines for Transfer of Technology'. In the year under report (2016-17) 50 ToT to industries have been executed by DRDO. The export potential of DRDO systems is evident from NOCs granted by MoD to the industries. 142 NOCs for export have been granted by MoD for 310 products for about R 17352 crore, out of

which, 88 products of worth R 10609 crore are based on technology developed by DRDO.

4.4.2 While discussing R&D in Defence Sector, noted international Defence analyst in oral submission before the Committee, stated the following:

> " ….just as in terms of policy-making, there is only integration of defence, foreign affairs, internal affairs handled by the Home Ministry, into a holistic picture, similarly, there is no integration of the scientific establishment and the defence R&D establishment. If you see, they are kind of compartmentalised, there are no reasons why these should be compartmentalised? There is no reason why ISRO's capability in surveillance space should not be utilised for military space R&D. There is no reason, right. It is just that we have created these structures separately; there are bureaucratic reasons why they have been separated. Of course, in the nuclear area under the Nuclear Deal with the United States, we have separated the civilian and the nuclear side. It is the civilian and the military side because of a deal, and we have taken on legal commitments that these two will remain separate. But in other areas there is no need for this kind of tight separation."

4.5 Partnership with Private Sector

4.5.1 When asked about the role of private sector in defence production, the Ministry, in written reply stated that :

> "The preamble to the Defence Procurement Procedure(DPP)-2016, specifically mentions that enhancing the role of MSMEs in the Defence Sector is one of the defining features of DPP. Following specific provisions have been introduced in DPP-2016 that would increase the participation of MSMEs in the defence sector.

- In the 'Make' category of capital acquisition, Government funded projects with estimated cost of prototype development phase not exceeding Rs.10 core and Industry funded projects with estimated cost of prototype development phase not exceeding Rs.3 crore are reserved for MSMEs.
- In addition, it has been mandated to involve MSME associations while carrying out feasibility studies for 'Make' projects. MSMEs have also been granted relaxation in the registration and profitability criteria for consideration as eligible "Indian Vendor" for participation in the 'Make' projects.
- In the discharge of offset obligations, a multiplier of 1.50 is permitted where MSMEs are Indian Offset Partners (IOPs).

  Government of India has notified the Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 under which a minimum of 20% of the total annual procurement is made mandatory from Micro & Small Enterprises by Central Ministries/Departments/Public Sector Undertakings w.e.f. 1st April, 2015.

The capability and viability of the defence and aerospace industry is built on the strength of supply chains, in which the MSMEs are intricately intertwined. There are substantially large number of MSMEs across the country supplying components and sub-assemblies and systems to the Defence Public Sector Undertakings, Ordnance Factories, Defence Research and Development Organisation and private industries.
The Outsourcing from MSEs has increased from 36 % in the year 2014-15 to 41% in the year 2016-17.

4.5.2 On the issue of tie up with various Universities/Colleges/IITs etc for original research in futuristic defence technology, the MoD submitted as under:-

"Defence Research & Development organization has collaborated with premier Universities and Research Institute in the country leading to creation of futuristic technologies for implementing in development of defence and security systems. DRDO has established various 'Centers for Advanced Technology' and 'Centers of Excellence' an academia across the country including IITs - Bombay, Madras and Delhi given below:-

i) Advanced Centre of Research on High Energy Materials (ACRHEM) at University of Hyderabad

ii) DRDO BU - Centre for Life Sciences at Bharathiar University, Coimbatore.

iii) Research &Innovation Centre (RIC) at IIT Madras.

iv) Centre of Propulsion Technology (CoPT), A Bi-Nodal Centre, at IIT Bombay and IIT Madras.

v) IC Bose Centre for Advanced Technology (JCBCAT) at Jadavpur University, Kolkata.

vi) DRDO-IITD Joint Advanced Technology Centre (JATC) at IIT Delhi.

DRDO has engaged academia and research institutes to collaborate for executing research projects and programs through its Centres with focus on technology domains assigned to each Centre.

Defence PSUs have also tied up and collaborating with colleges/Universities/IITs in their R&D programmes."

Chapter 5

Other Issues

5.1 International Cooperation

5.1.1 Defence cooperation has emerged as an important element of India's diplomacy and has served to strengthen relations with friendly foreign countries as well as advance our foreign policy objectives. Defence cooperation covers a wide range of activities and initiatives undertaken by the Ministry of Defence, Armed Forces and Coast Guard for enhancing mutual trust and understanding with counterparts in foreign countries. These initiatives include high level visits, training and capability building exchanges, military-to-military cooperation, joint exercises, defence industry collaboration as well as research and development tie-ups. The year witnessed an all-round intensification of India's defence diplomacy engagement with countries in our extended neighborhood, Africa and the Indian Ocean region as well as with major powers.

5.2 Futuristic Warfare

5.2.1 The concept of war has changed a lot due to various developments including technological advances. Now, the possibilities of traditional wars has come down. The wars are likely to be swift and short.

5.2.2 Elaborating it further, an international Defence Expert while depositing before the Committee submitted as under:-

> "In India, if we look at Defence preparedness both in terms of the concept as well as in policy terms, Defence preparedness is defined very narrowly.
>
> The last full-fledged war which India fought was 46 years ago in 1971. The world has fundamentally changed since then. There was no Internet in 1971, cyber was not an issue in terms of combat potential and the impact on warfare, space platforms were rudimentary in those days. The world has changed fundamentally in the technological sense, in an economic sense, in political sense and also in terms of threats that India confronts today but the evolution of India's Defence preparedness as far as evolution of India's fore structure is

concerned, has certainly not kept pace with the fast changing world that we have today."

5.2.3 Advocating redefining the concept of preparedness, an expert further added:-

"the concept of Defence preparedness needs to be redefined, needs to be broadened. Defence preparedness does not simply mean repulsing the next full-fledged aggression. It means much more that. It means ensuring that in the so-called peace time – there is no peace time because India is facing undeclared wars of different kinds – Defence preparedness ought to be such that no foe of India is able to undermine India's security."

5.2.4 He further added that:-

"we need to redefine the concept of Defence preparedness in policy terms, in terms of fore structure, in terms of procurement. We need to be cognizant of the fact that today the main threats to India are asymmetric in nature. Asymmetric warfare is all that is waged against India and we are not even debating how we can defeat this asymmetric warfare, what tools we need to employ, what kind of fore structure needs to evolve in response to this asymmetric warfare that India is facing and how should our procurement patterns change."

5.2.5 The Ministry of Defence, in a written document submitted to the Committee, elaborated following futuristic technologies:-

" The armed forces have a large variety of missiles. The present inventory is planned to be replaced with new generation missile systems in next 10 to 15 years.

The Armed Forces are holding Anti Tank Guided Missiles (ATGM) which are both Man Portable and Vehicle and Helicopter Mounted. The Air Defence Missiles also called surface-to-Air Missiles (SAM), are held by all the three Services. The Air-to-Air Missiles (AAM) are held by IAF and Navy for engaging aerial targets. Air-to-Surface Missiles (ASM) are used for engaging ground targets from aircraft. IAF and Navy (anti-Ship) are holding these missiles. Surface-to-Surface Tactical Missiles (SSM) are held by the Navy. These are categorized as Ship Launched Missiles and Submarine Launched missiles.

BDL is currently one amongst a few industries in the world having the capability to produce State-of-the-Art guided weapon systems. BDL is the prime production agency for all the missiles developed by DRDO under Integrated Guided Missiles Development Programme (IGMDP) and the weapon systems developed by the DRDO. BDL manufactures & supplies guided missiles, torpedoes and decoys. The four major products are KONKURS-M, INVAR, MILAN-2T & AKASH.

The core competence of the company lies in absorption of new technology, systems integration and upgradation of the existing products to meet the specific needs of the Armed Forces. Company expanded its activities to fulfill the needs of the Navy, with the production of under-water weapons. BDL supports DRDO in realizing new missiles and Torpedoes. Recently on 30th Sept 2015, Hon'ble RM has inaugurated a new missile integration and testing facility at Anantpur near Bangalore.

RADARS

The Armed Forces have a very large inventory of Radars which can be categorised as Air Defence Radars, Surveillance Radars, and Weapon Locating Radars for the Army; Air Early Warning Radars, Surface Early Warning Radars, Surface Navigation Radars, and Weapon Control Radars for the Navy; and Air Defence Radars, Surveillance Radars, and Air Borne Radars for the Air Force.

Radars which are currently in the inventory will be replaced over a period of time by state-of-the-art new radar systems, which are indigenous. DRDO has been very active in the design and development of various categories of radars and they are being manufactured by BEL. Some of the indigenous radars which are already contracted include radars for Air Defence and Surveillance. Major On-going projects of BEL are Akash Missile System, 3D Tactical Control Radar (TCR) and Schilka upgrade.

A high degree of self-sufficiency in the field of design and development and manufacturing of radars has been achieved by DRDO Labs and BEL, respectively.

UAVs

The UAV technology has the potential to transform the way in which the country's borders are secured and surveillance/reconnaissance missions are carried out by military and para-military forces. The Unmanned Aerial Vehicles (UAVs) with their array of sensors and performance capabilities, have acquired increased significance in contemporary military operations. With respect to their size, the UAVs are classified as

Micro/Mini UAVs, Short Range UAVs, Medium Altitude Long Endurance (MALE) and High Altitude Long Endurance (HALE) UAVs. These have been procured through imports.

The Armed Forces have recently signed a contract for Micro/Mini UAVs with an indigenous manufactures. All the three Services are operating a small quantity of MALE/Short Range UAVs. A case for procurement of Additional MALE UAVs is under process and the Services have worked out their long-term requirements. Short-term requirement for HALE UAVs have also been worked out.

DRDO is in the process of design and development of indigenous MALE UAV. Critical technologies that are required are in the field of aero-engines, navigation sensors, Lithium batteries, etc which are being developed /procured.

HAL has a clear roadmap for development and production of Unmanned Aerial Vehicles (UAVs). HAL has initiated R & D activities in design, development and manufacture of following classes of UAVs:

- **Mini UAV:** In-House Design and Development of Mini UAVs of 8 kg class has been taken up by HAL which would be useful for military, para-military and civil sectors for day and night surveillance up to 15 km range and operations up to 5 km above sea level. First flight of the Technology Demonstrator was carried out in Sep 2015.
- **Micro UAV:** Co-development of Micro UAV of 0.5 to 3 kg class has been taken up with CSIR NAL & ADE which are useful for homeland security, day/night surveillance up to 5 to 10 km range.
- **MALE UAV**: HAL has signed an MoU with ADE for Co-operation with ADE for Design & Development and production of Rustom II. Rustom II is a Medium Altitude Long Endurance (MALE) UAV which is being developed for Army, Air Force and Navy, to operate at medium to long ranges to gather real time, high quality imagery and signal intelligence from areas of interest. HAL is the production agency and is investing Rs. 210 Cr as risk sharing partner.
- **Rotary UAV**: HAL has a strategic tie-up with Aeronautical Development Establishment (ADE-DRDO) and Indian Institute of Technology (IIT-Kanpur), for Design and Development of Rotary UAV. Design and Development of 10 kg RUAV has been taken up which will enable assimilation of critical technologies pertaining of RUAV development. First flight is planned in 2016. On successful completion, HAL plans to Design and Develop RUAV of 50 kgs, 200 kgs and 500 kgs class.
- **Combat UAV**: Combat UAVs are expected to play a major role in the wars in future. HAL has the technology base available in the form of Tejas development. HAL can partner with DRDO for the Development of combat UAV. "

5.2.6 Regarding Cyber and Space technologies, following information was submitted :

> "Concurrently, a slew of measures towards optimizing the existing capabilities is ongoing, which include hardening of relevant networks and sharing of alerts and advisories among various Computer Emergency Response Teams (CERTs) within MoD. Coordination with other national Cyber Agencies and undertaking cyber awareness drives to educate the staff on threats, vulnerabilities and risks of cyber domain."
>
> India's Defence Space programme started taking shape along with civil programmes developed by ISRO. A beginning was made in the military use of space assets with the implementation of space based surveillance programme in 2001. To give impetus to space related military capabilities, the Government sanctioned establishment of present organization of Integrated Space Cell under HQ IDS to coordinate space issues of three Services. "

PART-II

OBSERVATIONS/RECOMMENDATIONS

Financial Resources

Increasing the Expenditure on Defence Services

1. The Committee note that India with its strategic location, having a coastline of about 7500 kms and land borders of 15000 kms of which 3323 kms are with Pakistan and 3380 kms with China, its western, north-western, northern and north-eastern borders remaining volatile because of historical as well as strategic reasons, and internal security threats, need Defence preparedness to be kept consistently at the highest level. From the data made available to the Committee, it is found that Defence expenditure has marginally increased since 2014-15 and when compared to Central Government expenditure, the percentage has declined from 13.15 during 2014-15 to 12.20 during 2017-18. Defence expenditure when analysed as a percentage of GDP, in the last few years it has ranged between 2.06 per cent (2014-15) to 1.56 per cent (2017-18). As per Stockholm International Peace Research Institute (SIPRI) study, defence expenditure as a share of GDP of China and France has remained the same, increased in case of Saudi Arabia and Russia and decreased in case of USA and UK in the last decade (2007-2017), however, keeping in view the scale of GDP the developed countries have, the decrease of defence expenditure as percentage of GDP in India, as per Government data, is more noticeable.

2. The Committee further note that the defence expenditure at 1.56% of GDP was at the lowest level since 1962 when India-China war was fought. In the current geo-political scenario, a country of the size of India cannot afford

complacency when it is a question of defence preparedness even for a two-front war while retaining its dominance in the Indian Ocean. The Committee therefore, strongly emphasize that allocation of adequate financial resources for defence preparedness both for the current needs and expansion & modernization plans should be accorded highest priority to enable the services to meet the challenges concerning safety and security of the country.

Increasing the proportion of Capital Procurement Budget within the Defence Budget

3. The Committee express their unhappiness that the share of Capital Expenditure as a percentage of total Defence Services Expenditure is abysmally low and is continuously declining over the years. In the years 2012-13 and 2013-14, the share of capital expenditure was 39% in each year, which in the year 2017-18 and 2018-19 came down to 33% and 34%, respectively. What is more worrisome is the situation whereby the procurement has to be adjusted as per the budgetary allocations made by the Government which are not as per the requirements projected as per LTIPP. The Committee observe that allocations under the Capital head are made for procurements for our Services which include defence equipments, weaponry, aircrafts, naval ships, constructing roads and bridges in border areas, etc. and any decrease in capital expenditure has an adverse impact on modernisation process of our forces and tantamount to compromising safety and security of our Country. The Committee strongly feel that in view of the intensity and complexity of our security challenges due to current geopolitical environment, India cannot afford to be lagging behind in

defence preparedness. There is an urgent need, therefore, to replace the obsolete armaments with state of the art weapon systems for which substantial increase in capital budget is essential. The Committee find the present situation unacceptable whereby the allocations are not being made as per the LTIPP, thereby defeating the purpose of having long term defence plans. The Committee, therefore, recommend that the capital procurement Budget should be in consonance with the projections made by the services as per LTIPP.

4. The analysis of the data with regard to budgetary allocations for capital procurement for services indicates variation in BE, RE and Actuals during various years. The allocations made at Budgetary Estimates stage have been consistently reduced at RE level, and even the reduced allocations could not be utilized fully during the years 2014-15 and 2015-16. In this scenario, the Committee are not able to appreciate the remarks of the Secretary, Defence Acquisition, during the course of deposition that they hear from the Department of Defence that the requirement of the forces is very high and the fund allocation to that extent is not there. The Committee, therefore, while recommending for adequate allocations for defence production would like the Department to analyse the reasons and take all the corrective actions to ensure that the resources allocated are fully utilized which would help in getting further higher allocations in the coming years.

<u>Self- Reliance in Defence</u>

5. The Committee note that the Preamble of the Defence Production Policy 2018 states India as one of largest importer of defence goods and services in the

world. It has specifically been mentioned that despite some salient achievements of our defence production ecosystem, a significant part of our defence requirements continue to be dependent on imports. During the course of examination, the Committee have been apprised by the Department of Defence Production that out of total defence production around 40 per cent is produced indigenously and 60 per cent is imported. The Committee while expressing serious concern over the prevailing situation observe that dependence on foreign suppliers particularly for military hardware not only results in huge expenditure on import of defence equipments but makes the security of the Country vulnerable as during emergency situations the supplier may not provide us the required weapons or spare parts. The Committee are concerned to note that the indigenisation level in the Defence Sector is increasing at a very slow rate. Nothing concrete has been done for implementation of the strategic partnership model unveiled by the Government in May, 2017 which envisaged private players playing a key role in building military platforms like submarine and fighter jets in India in partnership with major global defence companies.

The Committee find that the draft Defence Production Policy 2018 aims at making India one of the world's top five defence producers by 2025 with self-reliance in 13 areas covering almost the entire range of weapons and systems. The Committee while noting the vision document of DPP 2018, would like the Government to take urgent and immediate initiatives in the desired sectors so that India's dependence on imports is decreased thereby improving our defence preparedness. In this regard, the Committee would like to emphasize that

increasing local content in defence platforms and hardware will have a multiplier effect in the sense that it will result in a strong manufacturing sector, generate substantial number of jobs and also save the financial resources. Clear-cut road map should, therefore, be drawn up with effective monitoring to achieve the level of self-reliance envisaged as per the vision document of the draft policy. The Committee may be apprised of the specific steps being taken to that end.

6. The Committee observe that our defence PSUs have travelled a long journey and have talent and expertise in manufacture of various defence equipments and as such the role for defence PSUs which have been producers of key military platforms should be included in the strategic partnership models so as to provide a level playing field to PSUs.

<u>Shortage of Ammunitions in the Armed Forces</u>

7. The Committee during the course of examination have been apprised by the Ministry of Defence that the shortage strictly in the totality is not there yet there are 10-15 ammunitions where there is shortage and some of them of a critical nature.

The Committee find that the OFBs/DPSUs have achieved some expertise in armaments/weapon manufacturing although dependency on imported parts and systems is the area of concern. So far as the production of armaments by Ordnance Factories is concerned, the Committee note that the dependency on import with regard to heavy equipment range, has considerably decreased. In respect of T-90 tanks, the dependency on import has decreased from 40% to 13%

as stated by the representative of MoD during the course of evidence. The Committee still feel that more need to be done to reduce our dependency on imports. In the aforesaid scenario, the Committee recommend that adequate allocations should be provided under the Revenue Head for meeting the shortage of armaments with the Services besides upgrading the manufacturing capacity of OFBs and DPSUs serving to the Services in this regard.

Acquisition/upgradation for IAF

8. The Committee understand that a large proportion of our defence hardware have served their useful life cycle and now need to be replaced urgently. From the information given in Annual Report 2016-17 of the Ministry of Defence, it is noted that IAF is on a trajectory of modernization and is transforming itself into a strategic aerospace power with full-spectrum capability. The draft Defence Production policy 2018, speaks about reducing current dependence on imports and to achieve self-reliance in development and manufacture of various weapon systems and platforms which includes fighter aircrafts, medium lift and utility helicopters. Further the procurement for various aircraft/helicopters is under-way, inter-Governmental Agreement for procurement of 36 Rafale Aircrafts from France has been signed on 23 September, 2016; C-130J has already been inducted and the delivery of balanced aircraft is likely to be completed by July 2017; delivery of AH 64E Apache Attack Helicopters and Chinook Heavy Lift Helicopters is expected to be completed by March 2020. Besides Mirage 2000 and MiG-29 aircraft upgrade is under progress and few upgraded aircraft have already been operationlised in the IAF. The Committee note that air power has a very

important role with regard to defence preparedness in the present security scenario and as such strongly emphasize that budgetary allocation should not come in the way of planned acquisitions of aircraft/helicopters so that the requisite capacities could be built. Besides the Government should follow the acquisition status with the countries from which imports are being made for timely delivery of the aircraft/helicopters.

9. The Committee further note that comprehensive upgrade programme for various aircraft have been undertaken/are being undertaken which include Mirage 2000, MiG-29 aircraft, DARIN III, An-32, IL-76/78 fleet, Mi-17 helicopters. The Committee while noting the upgradation process would like to emphasize for replacement of the aircraft which have completed their life.

10. The Committee observe that as per the standard norm at any time there should be 70% serviceability of aircraft. But the Committee, during the course of evidence have been apprised that the availability/serviceability was 60%. The Committee in this regard would like to stress to address the issues with regard to maintenance and repair of aircraft to ensure serviceability level at any given time as per international norms.

11. The Committee note from the Annual Report 2016-17 that current lot of Su-30 MKI aircraft are being manufactured in HAL through transfer of technology. With regard to Tejas, the first fighter squadron of the IAF with LCA Tejas aircraft, has been formed on July 1, 2016. The Ministry of Defence has apprised that investment of around Rs.15000 crore is estimated to be made in the next five years towards enhancing production rate of LCA Tejas from 8 to 16 aircraft. One

of the expert who deposed before the Committee was all in appreciation for the indigenous production of Tejas and was of the view that Tejas product can be the bulk aircraft for Indian Air Force. The Committee would like the Government to take all the desired initiatives for increasing the production rate of LCA Tejas by HAL not only for our Services but also for exports to other countries. The Committee observe that the induction of more and more indigenous product Tejas in IAF fleet would result in uniformity in the type of aircraft and would also address the issue of maintenance and repair to a great extent.

12. The Committee note that on the one hand, the Secretary (Defence Production) during the course of deposition has stated that HAL have already got the orders of 40 Tejas and another 83 would be sufficient for next 25-26 years, HAL in response to queries raised during the informal discussion with them during the study visit has stated that the firm order to HAL would be liquidated by 2020-21. The Committee would strongly like to emphasize that the Services should plan their orders for the long term and place firm orders with HAL well in advance particularly when the production cycle for aircraft build is very high of the order of 2-3 years.

<u>Shortage of Trainer Aircraft/Accidents</u>

13. The Committee note that IAF is using Pilatus PC-7 aircraft for basic training purpose and 75 of these aircraft are directly procured from OEM. Further requirement of basic training is proposed to be met by HAL's indigenously designed basic trainer aircraft HTT-40. Defence Acquisition Council (DAC) has

cleared procurement for 70 aircraft for IAF. The production of these aircraft is expected to commence during 2019-20.

For the advance training purpose, IAF is using Hawk aircraft which is manufactured by HAL under Transfer of Technology from BAE System. HAL has so far supplied 82 Hawk aircraft to IAF and 17 Hawk aircraft to Indian Navy. Quotation has been submitted by HAL for additional requirement of 20 Hawks for IAF. Also, Navy has initiated action for 12 more Hawk aircraft for which HAL has submitted a budgetary quote.

The Committee have been apprised that design and development programmes for Intermediate Jet Trainer (IJT) and Basic Trainer Aircraft (HTT-40) are under way at HAL. The Committee during the course of examination have been apprised that in total 16 Dhruv helicopters have met with an accidents so far in India. The reasons for these accidents as brought out in the report of Court of Inquiry (CoI) have been mainly attributed to human error and environmental factors. The Committee in this regard strongly recommend to look into the issues related to training. Urgent steps should be taken for procurement of trainer aircraft to meet the needs of training. In this context, the Committee would like the Government/Services to consider taking the help of simulators and private companies which not only would compensate for the infrastructure gap but would also help in saving the capital expenditure. Environmental effects are to be remedied and this needs a special research programme. Committee would like that such a programme be initiated speedily by involving the ministries of Science and Technology and Environment, Forests and Climate Change.

Shortage of Night Vision Equipment

14. As per the status of Night Vision Equipment as stated by the Ministry of Defence in respect of Indian Army, as on date the holdings of night vision equipment vis-à-vis authorization are ranging from 70% to 80%. The deficiencies are due to routine discard for which procurement cases are actively being processed. The Committee have further been apprised that a contract for procurement of night vision Goggles for C-130 Aircraft has been signed on 16.09.2016. The Committee also find that third generation night vision devices like Electro Optical Fire Control System (EON-51) and Stabilised Optronic Pedestals (SOP) have been fitted on Indian Navy Ships. The Committee while taking note of the importance of Night Vision Equipment for military operations, would like to stress for taking all the desired initiatives to meet the deficiencies.

Ordnance Factory Board-Their role and contribution to preparedness of armed forces

15. The Committee note that 41 Ordnance Factories function under Ordnance Factory Board (OFB) and their core competence include small, medium and large caliber weapons, mortar equipment, signaling and related stores, rockets & aerial bombs, fuses, explosives, chemicals & propellants, trucks, tanks & its variants, night and day vision sights & instruments, brake parachutes, tentage, clothings etc. The turnover of the OFBs during 2015-16 was Rs.14158 crore which is proposed to be increased to Rs.20,000 crore in three years. With regard to modernization of OFB, the Committee find that Rs.2956 crore were spent during 11th Plan and during 12th Plan, the amount spent on modernization increased to Rs. 8635 crore, i.e., which is nearly three times increase from the spending during

the 11th Plan. So far as achievements of OFB are concerned, it *inter alia* include developing and supply of first NBC vehicle to Indian Army, participation in RFP of upgunning of 130 mm Gun to 155 mm x 45 Calibre Gun, development of MOD-II Chaff launcher system, 7.62 x 39 mm Assault rifle "GHAATAK", Bi-Modular Charge System (BMCS) and 155 x 45 Calibre Fund "Dhanush".

The Committee during the course of examination have been apprised about the major challenges/constraints before the OFBs like Non-Uniform demand from Armed Forces & Security Forces, uneconomic quantities to be produced to meet strategic needs, difficulties in entering into long term agreement with dedicated vendors and low scale of production which does not attract the vendors to respond to LTE/OTE. The Committee understand that there are quality issues on the part of the Services with regard to the armaments produced by the Ordnance Factories. The Committee while taking note of the achievements and the constraints of Ordnance Factories would like to emphasize for better coordinating mechanisms between the OFBs and the Services. There is an urgent need on the part of the Services to place the orders for various armaments well in advance keeping in view the complexities and the long period required for production of armaments so as to sustain the viability of these Factories. Now when the draft Defence Production Policy 2018-19 talks of active participation of private sector in the defence production, OFBs need to work more professionally and increase their competence. As mentioned earlier, modernisation and upgradation of technology in Ordnance Factories should be given top priority.

Strengthening DPSUs

16. With the objective of achieving self-reliance in defence production, the DPSUs which include the Ordnance Factories have been continuously modernizing and upgrading their capabilities and expanding their product range. The Committee also note that DPSUs, through in-house research and development initiatives, have developed a large number of products in addition to a number of products and equipment being produced through transfer of technology. The Committee are however, concerned that due to high dependence on external content, low percentage of value addition in the DPSUs, low labour productivity and high production costs, the DPSUs have not been able to meet the defence requirements of the Country. Moreover, delays on the part of foreign suppliers also lead to cost and time overrun in development of weapon systems. To quote an example, the manufacturing of warships and submarines in Mazagaon Dockyard Limited, in the past, got delayed because the foreign supplier did not supply vital components in time. The Committee also note that the DPSUs take long time in the acquisition/production of weapon systems due to a number of other factors including changes sought in weapon specification by the Armed forces, delay in availability of know-how from external sources. The Committee feel that the DPSUs have, over the years, accumulated experience and technically skilled manpower to deliver high value and high volume projects. About Mazagaon Dockyards Limited, the Committee have been informed that to overcome the shortcomings observed during the earlier built ships and also to improve the productivity and reduce the build periods, development of weapons

and sensors is being expedited through DRDO and DPSUs through various routes such as 'Buy and make', 'Buy and make (Indian)' and 'Make' acquisition process. Moreover, indigenisation of warship building steel is being undertaken through DPSU and private industries and large scale outsourcing is being resorted to for parallel construction of part of ships at different geographical locations.

The Committee feel that optimum utilisation of potential of the DPSUs is essential for their strengthening. For this they have to be enabled to produce not only for our own requirements but also be able to export their products. In this regard, the Committee feel that platforms such as Defexpo are ideally suited to project the capabilities of DPSUs. The Committee, accordingly, recommend that DPSUs may be given adequate autonomy and resources to enable them to operate on commercial basis and sell their products to the global customers without depending continuously on the Government. However, the Committee feel it necessary to underline that in case of conflict, the demands of the national armed forces have to be given primacy.

<u>Gaps between orders received and delivery scheduled/made - Synergy between Armed Forces and DPSUs in Defence Hardware Production</u>

17. From the data made available, the Committee find that the overall value of production of 10 DPSUs which include OFB has increased from Rs.41047.74 crore during 2013-14 to Rs.54132.36 crore during 2016-17. However, the data of performance of individual DPSU indicates that in MDL and GRSE, the value of production has decreased from 4169.64 crore and Rs.1707 during the year 2015-

16 to Rs.3510 crore and Rs.936.70 crore during 2016-17 respectively. The Committee would like to be apprised about the specific reasons for decline in value of production in these two DPSUs.

18. The Committee further find that the percentage achievement with regard to supply of ammunition to Army by the OFB has been stated by the Ministry as 93, 98 and 91 per cent during the years 2014-15, 2015-16 and 2016-17 respectively. However, the overall data of indent for 2014-19 has been stated to be Rs.26, 475 crore against which the delivery made till March, 2017 has been shown as Rs.12,919 crore which do not commensurate to the percentage achievement which has been stated as more than 90 per cent as stated above. The Department has furnished the detailed data with regard to order received, delivery made and delivery due by OFB and DPSUs with regard to various items indented by the forces which indicates that in some of the cases the delivery has yet not started even though a substantial period has lapsed since the contract was made. For example, in case of HAL, LCA Tejas (FOC configuration) contract was made during December, 2010 by IAF and delivery is yet to start. Again in case of MDL, the contracts for Project P75 Submarines(6); Project P15B Destroyers(4) and Project 17A Stealth Frigate(4), were made during October, 2005, January, 2011 and February, 2015 respectively, but the deliveries are yet to start. There are similar cases in case of other DPSUs too, where the delivery is yet to start or most of delivery is due. One of the expert has drawn the attention of the Committee towards long time taken for production of destroyers in MDL which take almost five years whereas the same kind of vessels can be produced in 2-2.5

years in Asia and globally. In this context, the Department of Defence Production has apprised the Committee that due to the several productivity measures taken recently by MDL, the average build period is expected to come down from earlier 88 months (P15A Destroyers) to 72 months (P15B Destroyers).

The Committee note from the aforesaid scenario that there is a huge gap between the orders received, targeted deliveries and deliveries made. The Committee strongly feel that there is need for synergy between the Services and DPSUs which is absolutely essential for defence preparedness of the country for which some hand-holding on the part of armed forces of the DPSUs is required and both need to work in the spirit of partnership. In the opinion of the Committee, such lack of coordination is detrimental to our national interests. The Committee, therefore, recommend that the Ministry may constitute an institutional mechanism consisting of representatives of both the parties to facilitate synergy between them. The Committee may be apprised of steps taken in this regard.

19. The Committee note that the existing Procurement system for advanced weapons involves three stages. The first stage is the issue of Request for Proposal and second stage is that of field trials. The Committee have been informed that the second stage takes considerable time- sometimes upto two years for completion of trials. The third stage which requires caution and diligence is the most difficult stage of contract negotiation stage. The Committee further note that procurement and acquisition of defence hardware is a long drawn process where there is involvement of a large number of stakeholders. The

coordination issues between such large number of stakeholders sometimes result in avoidable delays. The introduction of the DPP 2016 tries to redress the situation. The Committee feel that with proper advance planning the time for first and second stage can be substantially reduced which would address the issue of shortage of required defence hardware with the defence forces. Sometimes, the decision to buy advanced weapon systems also result in controversies being created on the ground of payment of kickbacks and commissions. The Committee feel that such delays are avoidable and ultimately, the defence preparedness of the Country suffers. The Committee, accordingly, recommend that Ministry may take appropriate steps to constitute an integrated institutional mechanism with adequate in-built transparency consisting of all key stakeholders in order to reduce delays in procurement process.

Partnership with Private Sector

20. India has become one of the largest importer of defence goods and services in the world. As per Stockholm International Peace Research Institute (SIPRI) data, India's share in global arms imports during 2012-16 is 12.8%. The Committee also note that in order to achieve maximum extent of self-reliance in defence sector, the Government has provided incentives to private sector under the Make in India Programme. It has allowed 100% FDI in defence sector- while up to 49% FDI will be under automatic route, FDI above 49% will be through Government route where it is likely to result in access to modern technology. Further as per the draft DPP Policy 2018, FDI regime in defence would further be liberalized and FDI up to 74% under automatic route would be allowed in niche

technology areas. There are other initiatives also taken to promote the involvement of private sector and MSMEs in defence sector.

While noting that harnessing available potential in private sector, using its management, scientific and technological skills may be key to achieving total self-reliance, the Committee find that there is no existing mechanism to facilitate public-private partnership in the defence sector. Moreover, the strategic partnership model formulated for defence production does not specify a clear role for major defence PSUs. There seems to be a total lack of coordination among Government agencies in so far as integrated approach to public-private partnership in defence sector is concerned. The Committee are of the opinion that given long history of weapons manufacturing in India, there is a skill set and trained man power existing in the Country, particularly in the DPSUs which can be leveraged for further growth. However, to make private sector- public sector partnership meaningful, the DPSUs have to extend necessary assistance to private sector. Such partnership will not only result in substantial savings of money but also create jobs in the country. Such partnership will be able to combine the capabilities existing in the private sector with experience of public sector and prove to be a win-win situation for both and will result in overall betterment of the Country. The Committee, therefore, recommend that appropriate steps may be taken to institutionalise public-private participation in defence sector. The Committee may be informed of the steps taken in this regard.

21. The Committee observe that defence is highly sensitive area and utmost care need to be taken to maintain the confidentiality/secrecy about our

data/technology/capabilities. While taking initiatives to liberalize FDI and private sector partnership in defence production, the Committee would like the Government to take all the requisite precautions to ensure that our defence capabilities are not compromised at any cost.

Encouraging MSMEs in Defence sector

22. The Committee note that for encouraging Small and Medium Enterprises (MSME), Government of India has come out with a notification whereby 20% of orders are to be placed with MSME sector. The Government has also decided to formulate a scheme for providing financial assistance to these enterprises to take up design and development work in the defence production. The Committee also note that the Technology Development Fund (TDF) has been established to encourage participation of public/private industries specially MSMEs so as to create an ecosystem for enhancing cutting edge technology and capability for defence application. Under the TDF Scheme, funding is covered through grants to industry that may work in collaboration with academia or research institutions to carry out innovation, research and development. The Committee desire that the Ministry should ensure that the financial assistance as envisaged under the Scheme is provided to the MSME sector and adequate orders are placed with them to fully utilise their potential. The Committee would also like the Government to examine the feasibility of inserting a provision in the defence offset policy mandating setting up of defence production facilities in the MSME sector in order to expand domestic production base and promote 'Make in India' initiative.

Performance of Defence Research and Development Organisation (DRDO)

23. The Committee note that the Defence Research and Development Organisation is the premier institution in defence research in the Country with more than 50 laboratories, 5000 scientists and 20,000 other scientific, technical and supporting personnel and a budget of about Rs. 13600 crore which is about 5.5% of total defence budget. (DRDO) is Country's leading organisation involved in design and development of indigenous Defence systems. DRDO is engaged in developing defence technologies covering aeronautics, armaments, electronics, combat vehicles, engineering systems, instrumentation, missiles, advanced computing and simulation, special materials, naval systems, life sciences, training, information systems and agriculture. The Committee also note that the DRDO and the DPSUs are expected to be storehouses of strategic know how in the development of missiles, armaments, light combat aircrafts, radars, electronic warfare systems and other defence hardware. In this background, the Committee are surprised to note that the Country has to depend on foreign suppliers not just for sophisticated weapons but also for basic defence armaments and that DRDO has not been able to meet nation's expectations. The Committee note from the 2015 report of C&AG that an examination of 14 mission mode projects, carried out by DRDO laboratories, revealed that all projects failed to achieve their timelines and the probable date of completion (PDC) was extended many a times. These mission mode projects include the crucial S-band surveillance system 'Rohini' radars, secure video and fax communication between airborne platforms and ground station 'Meghdoot' and electronic warfare suit for the modified MIG-29

fighters. Further, the Committee also note that a high power Committee constituted by the Ministry of Defence which reviewed the functioning of DRDO had said that at least 11 laboratories of the DRDO need to be closed down or amalgamated and its "non-core" research activities stopped. The high powered committee also said that DRDO needs to work with "clearly defined" objectives to develop "weapon systems and platforms". The committee felt that end-users — the three services — must be consulted on areas of research and development of weapon systems. The Committee are of the view that the functioning of DRDO needs a major overhaul and its contribution in the context of country's requirements need to re-examined. The Committee would also like the Government to examine various reports coming out in media/blogs about non-development of seeker technology for development of Short-Range Surface to Air Missiles (SRSAM).

Leveraging Our Capabilities in Space and Information Technology for R&D in Defence

24. Vision statement of Draft DPP 2018 states about making India among the top five countries of the world in Aerospace and Defence industries, with active participation of public and private sector, fulfilling the objective of self-reliance as well as demand of other friendly countries. The Committee note that alongwith the DPSUs, the Country has institutions like ISRO in the field of research in cutting edge technologies in the field of missile and space technology. Performance of ISRO has been laudable and it has become a world leader in satellite launch vehicles. It is also offering its services on commercial basis to

other countries. The Committee feel that it is very important to leverage our capabilities in space and nuclear technology not only for self reliance in defence hardware but also to become a major exporter. For this, an attitude of partnership and collaboration needs to be developed between organisations such as ISRO, DRDO and the DPSUs. The Committee, therefore, recommend the formation of an inter-ministerial group to facilitate such collaboration. The Committee may be apprised of steps taken in this direction.

Defence Preparedness for Future Wars

25. The Committee note that there has been a fundamental change in the nature of modern warfare. Apart from maintaining a massive conventional arsenal, countries also need to prepare for future wars. Future warfare is headed towards cyber warfare, drones, automated warfare systems, stealth technology and precision guidance. The foundation of such warfare systems are information technology and artificial intelligence. The Committee also note that preparedness for futuristic wars involve all three wings of armed forces and Country needs to have state-of-the-art technologies on all three fronts. The Committee, however, feel that preparation for futuristic warfare has to be undertaken without any compromise on conventional war preparedness. The Committee understand that the Government is seized of the importance of futuristic war technologies and through its R&D institutions, is working to develop them. However, the Committee feel that the Country needs to invest more resources on getting ready for futuristic warfare and also leverage its capabilities in information technology for this. The Committee, therefore, recommend that the Government may take steps for constituting an institutional arrangement to oversee the state of

preparedness of the country in futuristic warfare. Adequate flexibility should be introduced in the system to leverage our capabilities, including those existing in private sector, in other related sectors such as space technology, information technology and artificial intelligence for preparation relating to futuristic warfare.

International Cooperation in Defence

26. The Committee note that cooperation in defence sector among friendly countries is an integral element of defence preparedness. The geographical location of the Country makes it incumbent to seek partnership in defence sector with friendly countries. The Committee feel that the architecture of such a partnership may be based on shared values and interests. The Committee, accordingly, recommend that the Government take adequate steps to ensure that regional and global partnership with friendly countries in defence sector is fully integrated into our Defence Preparedness architecture. The Committee may be informed of the steps taken in this regard.

Contract Writing relating to Defence Hardware Procurement

27. The Committee note that entering into contract with foreign Governments and foreign defence suppliers is a highly specialised job. The Committee have been apprised by the Ministry of Defence that as per standard composition of Contract Negotiation Committee (CNC), Acquisition Manager, Technical Manager, Finance Manager, Advisor Cost alongwith representatives of DGQA/DGAQA/DGNAI, User department and SHQs are nominated in CNC. The expert who deposed before the Committee brought their attention to lack of

expertise in writing contracts due to which the foreign suppliers are able to take advantage of loopholes and maximise their profits and, at the same time, adversely affect our interests. Moreover, in the absence of stringent conditions, they may also go back on their commitment to supply spares and transfer technological know-how on one pretext or other during emergency. Although the Ministry of Defence in the written replies has stated that no incident has come to the notice of the Government where the Indian interests were adversely impacted due to lacunae/loopholes in contract writing, HAL, has requested for Government support to ensure that comprehensive ToT is provided to the Indian manufacturer. It has specifically been mentioned that when the aircraft is manufactured under ToT, OEMs do not provide ToT for critical and high end technology items. The aforesaid contention of HAL clearly indicates need for making our contract writing system more professional so as to fully protect the interest of Services/country. The Committee, therefore, feel that a dedicated team of personnel who have sufficient expertise in contract writing, particularly in defence acquisitions, is the need of the hour. The Committee, accordingly, recommend that the Ministry may take steps to create a team of skilled personnel with adequate training for writing contracts in the defence acquisitions. The Committee also desire that services of senior qualified representatives of the armed forces may also be secured during contract finalisation.

Miscellaneous

Human Resources of DPSUs and Other Defence Production Institutions

28. The Committee note that a large number of people, including technical personnel are employed in the DPSUs, OFBs and organisations such as DRDO. So far as the Ordnance Factories are concerned, the Committee have been apprised that the existing strength of OFBs officers/industrial employees/non-industrial employees is 87474 out of total strength of 145503. Even when out of the sanctioned strength of 2981 Group A officers, the existing strength is 1804 officers which include engineers and non-technical officers who are on deputation. The Committee have been apprised that the sanctioned strength of ordnance factories is intended towards catering to peak load requirements of Indian Armed Forces while existing strength is maintained for meeting the current load of the Armed Forces on annual basis. The flexibility is required to help Indian Ordnance Factories to augment the manpower at a very short notice in times of exigency and to cater to the workload from time to time. The Committee are not able to comprehend why such a large number of officers and employees are to be kept as a cushion to meet the short notice exigencies. The Committee in this regard would like to recommend to review the manpower requirement of Ordnance Factories. Besides, the Committee would also like to emphasise to use the trained manpower in the OFBs/PSUs for the defence purposes.

29. The Committee also note that many talented scientists exit from premier research institutions such as DRDO to find better opportunities in foreign based companies which is detrimental to our interests. Moreover, the Committee also

find that technical manpower in the DPSUs such as HAL are concerned about their future because of lack of orders from the Government. Reportedly same situation prevails in other DPSUs also. The Committee, therefore, recommend that it is in our national interest to ensure that the manpower possessing valuable knowledge, experience and expertise are retained in the Country by providing better work environment, research infrastructure and recognition including appropriate financial incentives. The Government needs to ensure that there is no anxiety among the technical personnel about their future.

30. HAL in a written submission before the Committee has made a suggestion for creation of additional post of Director (Corporate Planning and Business Development). Besides, the attention of the Committee has been drawn to the need for upgradation of pay scales of officers of the company on par with PSUs like BHEL/NTPC based on the recommendations of the Expert Group constituted by the Government under the Chairmanship of Shri B. K. Chaturvedi for restructuring and strengthening of HAL. The Committee would like the Ministry of Defence to consider the proposals submitted by HAL positively in view of interest of the organisation.

NEW DELHI;
July, 2018
Shravana (Saka)

DR. MURLI MANOHAR JOSHI,
CHAIRPERSON,
ESTIMATES COMMITTEE.

MINUTES OF THIRD SITTING OF THE COMMITTEE ON ESTIMATES (2015-16)

The Committee sat on Monday, the 29th June, 2015 from 1100 hrs. to 1345 hrs. in Committee Room 'E', Parliament House Annexe, New Delhi.

PRESENT

Dr. Murli Manohar Joshi – Chairperson

Members

2. Shri Sultan Ahmed
3. Shri Ashwini Kumar Choubey
4. Shri Ram Tahal Choudhary
5. Col. Sonaram Choudhary
6. Shri Ramen Deka
7. Shri Kalikesh Narayan Singh Deo
8. Shri Sanjay Dhotre
9. Shri P.C.Gaddigoudar
10. Shri Sudheer Gupta
11. Smt. Darshana Vikram Jardosh
12. Shri P. Kumar
13. Shri Ravindra Kumar Pandey
14. Md. Salim
15. Shri Arvind Sawant
16. Shri Ganesh Singh
17. Shri Rajesh Verma
18. Shri Jai Prakash Narayan Yadav

SECRETARIAT

1. Shri Devender Singh - Additional Secretary
2. Shri Vipin Kumar - Director
3. Shri Srinivasulu Gunda - Additional Director
4. Shri U.C. Bharadwaj - Deputy Secretary

WITNESSES

MINISTRY OF DEFENCE

Sl. No.	Name	Designation
1.	Shri Ravi Kant	Additional Secretary
2.	Shri J.R.K. Rao	Joint Secretary (ES)
3.	Shri K.K. Pant	Joint Secretary (AS)
4.	Smt. Kusum Singh	Joint Secretary (P&C)
5.	Rear Adm. (Retd.) N.K Mishra	C&MD (HSL)
6.	Rear Adm. (Retd.) A. K. Verma	CMD (GRSE)
7.	Cdr. P.R. Raghunath	Officiating, CMD (MDL)
8.	Shri V. Udaya Bhaskar	CMD (BDL)
9.	Radm (Retd.) Shekhar Mital	CMD (GSL)
10.	Shri S.K. Sharma	CMD (BEL)
11.	Shri P.R. Naik	Director, (BEMEL)
12.	Shri M. Narayana Rao	C&MD (MIDHANI)
13.	Dr. T. Suvarna Raju	Chairman (HAL)
14.	Shri Subir Mallick	JS&AM (LS)
15.	Shri Rabindra Panwar	JS&AM (MS)
16.	Shri Rajiv Verma	JS&AM (Air)
17.	Maj. Gen. SS Hasabnis	TM (LS)
18.	Shri S. Yamdagni	DGOF & Chairman OFB
19.	Shri D. K. Mahapatra	Secretary, OFB
20.	Dr. Sudershan Kumar	C CR&D & Chairman OFB
21.	Shri GS Malik	CC R&D (RM & Imp)
22.	Dr. JP Singh	Director
23.	Air Vice Marshal Sandeep Singh	ACAS (Plans)
24.	Maj. Gen. I Narayana	ADG (WE)

2. At the outset, the Chairperson welcomed the Members to the Sitting of the Committee and briefed them about the agenda of the meeting. He then directed that the representatives of the Ministry of Defence be called in.

[The witnesses then entered the Committee room]

3. The Chairperson welcomed the representatives of the Ministry of Defence and drew their attention to Direction 55(1) of 'Directions by the Speaker, Lok Sabha' regarding confidentiality of the proceedings of the Committee. Thereafter, he asked the representatives to brief the Committee on the subject 'Defence Production and Procurement'. The Ministry gave powerpoint presentation giving an overview of the subject. The main points of the discussion related to the objectives, pricing policy, modernization, research and development activities, future programmes for production and procurement of technology and other necessary items by the Ministry of Defence. Further, the Committee were also briefed about the profile of various Defence Public Sector Undertakings (DPSUs) which inter-alia included the value of production, profit, R&D Expenditure and modernization expenditure alongwith the current product profile and key projects of these DPSUs. The Members raised several queries and sought clarification concerning the above aspects from the representatives of the Ministry. The representatives of the Ministry gave clarifications on the points raised by the Members of the Committee. The Chairperson directed the representatives of the Ministry to submit written replies to the Committee Secretariat in respect of the unanswered queries within a week or at the earliest possible date. The representative of DRDO also requested to give them some other time to fully brief the Committee about the research work and other strategic programmes being under taken by their organisation. The Chairperson agreed to their request.

4. Thereafter, Chairperson informed the Members of the Committee about the sad demise of Shri Dileep Singh Bhuria, a sitting Member of the Committee. The Committee passed a condolence resolution and observed silence to pay homage to the departed soul.

5. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.

MINUTES OF THIRD SITTING OF THE SUB- COMMITTEE OF DEFENCE OF COMMITTEE ON ESTIMATES (2015-16)

The Sub- Committee sat on Tuesday, the 13th October, 2015 from 1500 hrs. to 1640 hrs. in Commmittee Room 'C', Parliament House Annexe, New Delhi.

PRESENT

1. Shri Kalikesh Narayan Singh Deo - Convener
2. Shri Ram Tahal Chaudhary
3. Col. (Retd.) Sona Ram Chaudhary
4. Shri P. Kumar

SECRETARIAT

1. Shri Devender Singh – Additional Secretary
2. Shri Vipin Kumar – Director
3. Shri Srinivasulu Gunda – Additional Director

LIST OF REPRESENTATIVES

MINISTRY OF DEFENCE, DEPARTMENT OF DEFENCE PRODUCTION

1. Shri A.K Gupta, Secretary (DP)
2. Smt. Surina Rajan, Addl. Secy. (DP)
3. Shri K.K. Pant, JS (AS)
4. Shri Sanjay Prasad, JS (LS)
5. Shri Bharat Khera, JS(NS)
6. Dr. A. R. Sihag, DG (Acq.)
7. Dr. Sudershan Kumar, CCR&D
8. Shri A.K Prabhakar, DGOF &Chairman, OFB
9. Lt. Gen Ravi Thodge, MGO
10. Air Marshal BBP Sinha, AOA
11. AVM Krishna BR, ACAS (Proj)
12. Shri Shamsher Singh, ADG QA (A)

13. Shri V Udaya Bhaskar, CMD, BDL
14. Dr. T. Suvarna Raju, CMD, HAL
15. Shri S. K Sharma, CMD, BEL
16. Brig OP Gulia, DACIDS
17. Shri DK Mahapatra, Secretary/OFB
18. V Adm GS Pabby, CWP&A
19. Maj Gen JS Menon, ADG (EM)
20. Shri Prateek Kishore, HPO
21. Shri Ravin Kulshrestha, Dir. (P&C)

2. At the outset, the Convenor welcomed the representatives of the Ministry of Defence (Department of Defence Production) to the sitting of the Sub-Committee on Defence of Committee on Estimates (2015-2016) for briefing on the subject 'Preparedness of Armed Forces, Defence Production and Procurement with special reference to Missiles/Radars/UAVs and other futuristic technologies.' and drew their attention to Direction 55(1) of 'Directions by the Speaker, Lok Sabha' regarding confidentiality of the proceedings of the Committee.

3. Thereafter, a representative of the Ministry of Defence (Department of Defence Production) made a power point presentation on the subject. During the power point presentation, the representative of the Ministry explained about various aspects and working of Defence Production and Defence Industry base like Ordnance Factory Board, Defence PSUs and Private sector participation, their achievements, major landmarks, production capacities, value of production, R&D expenditure, etc. The Committee sought clarification on various issues related to the subject on which representatives of the Department responded. To the points on which the representatives could not readily responded, the Convener directed the Department of Defence Production to furnish written replies within 15 days.

4. The witness then withdrew. The Sub-Committee then adjourned.

5. The verbatim proceedings of the sitting of the Sub-Committee were kept on record.

MINUTES OF FOURTH SITTING OF THE SUB- COMMITTEE OF DEFENCE OF COMMITTEE ON ESTIMATES (2015-16)

The Sub- Committee sat on Friday, the 20th November, 2015 from 1130 hrs. to 1300hrs. in Committee Room No. 139, Parliament House Annexe, New Delhi.

PRESENT

1. Shri Kalikesh Narayan Singh Deo - Convener
2. Dr. Sanjay Jaiswal
3. Shri Ram Tahal Choudhary
4. Shri P. Kumar
5. Shri Anil Shirole

SECRETARIAT

1. Shri Vipin Kumar – Director
2. Shri Srinivasulu Gunda – Additional Director

LIST OF REPRESENTATIVES

MINISTRY OF DEFENCE, DEPARTMENT OF DEFENCE PRODUCTION

1. Smt. Kusum Singh, JS (P&C)
2. Shri K.K. Pant, JS (AS)
3. Shri Sanjay Prasad, JS (LS)
4. Shri AKK Meena, JS &AM (MS)
5. Dr. K. Tamilmani, DG (Aeronautics)
6. AVM BR Krishna, ACAS (Project)
7. Shri V Udaya Bhaskar, CMD, BDL
8. Dr. T. Suvarna Raju, CMD, HAL
9. Shri S. K Sharma, CMD, BEL

2. At the outset, the Convener welcomed the representatives of the Ministry of Defence, Department of Defence Production to the sitting of the Sub-Committee on Defence of Committee on Estimates (2015-16) for briefing on the subject 'Preparedness of Armed Forces Defence Production and Procurement with special reference to weapons and aircrafts with Indian Air Force' and drew their attention to Direction 55(1) of 'Directions by the Speaker. Lok Sabha' regarding confidentiality of the proceedings of the Committee.

3. Thereafter, a representative of the Ministry of Defence, Department of Defence Production made a power point presentation regarding 'Preparedness of Armed Forces, Defence Production and Procurement with special reference to weapons and aircrafts with Indian Air Force'. During the power point presentation, the representative of the Ministry explained about the availability of various aircrafts and weapons being used by the Indian Air Force. The Committee sought clarification on various issues related to the subject to which representatives of the Department responded. On the points/issues raised by the Members, which the representatives could not readily responded, the Convener desired the Department may furnish written replies on those issues/points within 15 days.

4. The verbatim proceedings of the sitting of the Sub-Committee were kept on record.

The Sub-Committee then adjourned.

MINUTES OF EIGHTEENTH SITTING OF THE COMMITTEE ON ESTIMATES (2016-17)

The Committee on Estimates (2016-17) sat on Tuesday, the 28th February, 2017 from 1100 hrs. to 1400 hrs. in Committee Room 'C', Parliament House Annexe, New Delhi.

PRESENT

Dr. Murli Manohar Joshi – Chairperson

MEMBERS

2. Shri A. Arunmozhithevan
3. Shri George Baker
4. Shri Ashok Shankarrao Chavan
5. Shri Ashwini Kumar Choubey
6. Shri Sanjay Dhotre
7. Shri P.C. Gaddigoudar
8. Shri P. Kumar
9. Shri K.H. Muniyappa
10. Shri Bhagirath Prasad
11. Shri Konakalla Narayan Rao
12. Shri Arvind Sawant
13. Shri Gajendra Singh Shekhawat
14. Shri Jai Prakash Narayan Yadav

SECRETARIAT

1.	Shri N.C. Gupta	–	Joint Secretary
2.	Shri Vipin Kumar	–	Director
3.	Shri R.S. Negi	--	Under Secretary

WITNESSES

Sl. No.	Name	Designation
1.	Dr. Bharat Karnad	Professor, National Security Studies, Centre for Policy Research, New Delhi
2.	Dr. Brahma Chellaney	Professor, Centre for Policy Research, New Delhi
3.	Commodore C. Uday Bhaskar (Retd.)	Director, Society for Policy Research, New Delhi

2. At the outset, Chairperson welcomed the Members to the sitting of the Committee and briefed them about the subject matter to be transacted in the Sitting. Thereafter directed that Dr. Bharat Karnad, Professor, National Security Studies, Centre for Policy Research, New Delhi be ushered in.

3. The Chairperson welcomed the witness and drew his attention to Direction 55 (1) of Directions by the Speaker, Lok Sabha, regarding confidentiality of the proceedings of the Committee. After the customary introduction was over, the Chairperson asked the witness to brief the Committee on the subject 'Preparedness of Armed Forces - Defence Production and Procurement'. Thereafter, Dr. Bharat Karnad briefed the Committee about the structural problems in Defence Production and Procurement. He stated that in absence of any vision document or well defined strategy/game plan and National interests, various agencies of government and various wings of the Defence Forces have clash of interpretations on these issues. He also opined that there is a need for self reliance in Defence Production, development of indigenous defence industry, insufficient stock of War Wastage Reserve. Is also dealt with issues related to leak of sensitive information /confidentiality/security of imported Arms, import of obsolete defence technologies, deficiencies/loopholes in contract writing for Defence Procurement and non-implementation of terms and conditions of defence contracts (particularly regarding technology transfers). He also raised his serious concern regarding the poaching of Indian brains trained in cutting edge defence technologies by the Chinese companies.

The witness then withdraw

At 1200 hrs the Committee adjourned for the Tea break.

4. Thereafter, resuming the discussion, Dr. Brahma Chellaney briefed the Committee that the Indian defence preparedness has not kept pace with the changing world. He emphasized that India need to integrate its defence preparedness with foreign policy and internal security and also need to integrate its scientific R&D with Defence R&D; need for deputation of Uniformed officers and diplomats in senior positions in Defence Ministry. He also suggested that instead of emphasizing on conventional warfare, we need to build our capacities in Cyberspace, Missiles and Nuclear preparedness.

5. Commodore C. Uday Bhaskar while briefing the Committee stated that India's defence preparedness is well below par and dependent on imports. The performance of the DPSUs and Ordnance Factories is not upto the mark. He also felt that defence procurement is plagued by ineptitude and turpitude and lack domain expertise among current civilian officers in Defence Ministry. He emphasized that Indian Public Sector cannot meet its requirement, so involvement of private sector is desirable in defence production.

6. Thereafter, Dr. Bharat Karnad briefed the Committee that in its current form, Make in India Programme is just another name for licensed production which we have done in 60 years and Government should emphasize on 'Made in India' instead of 'Make in India' by designing, developing and producing our own technologies. He also suggested that all DRDO Labs, Research Units, OFB factories etc. should be handed over to Private Sector Industrial giants. Government should fund upto prototype and then procure final weapons systems by competitive process from them.

7. The Members raised several queries and sought clarifications concerning the above aspects from the witnesses. The witnesses gave clarifications on most of the points raised by the Members. The Chairperson then directed the witnesses to submit replies in respect of the unanswered queries to the Committee Secretariat at the earliest.

The witnesses then withdrew.

8. The verbatim proceedings were kept on record.

The Committee then adjourned.

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MINUTES OF TWENTY SECOND SITTING OF THE COMMITTEE ON ESTIMATES [2016-17]

The Committee on Estimates (2016-17) sat on Tuesday, the 11th April, 2017 from 1500 hrs. to 1740 hrs. in Committee Room 'D', Parliament House Annexe, New Delhi.

PRESENT

Dr. Murli Manohar Joshi, Chairperson.

MEMBERS

2. Shri George Baker
3. Shri Ashok Shankarrao Chavan
4. Shri Ram Tahal Chaudhary
5. Col. Sonaram Choudhary
6. Shri Raman Deka
7. Shri Sanjay Dhotre
8. Shri P. C. Gaddigoudar
9. Shri K. H. Muniyappa
10. Shri Bhagirath Prasad
11 Shri Arvind Sawant
12. Shri Jugal Kishore Sharma
13. Shri Gajendra Singh Shekhawat
14. Shri Anil Shirole

SECRETARIAT

1.	Shri N. C. Gupta	Joint Secretary
2.	Shri Vipin Kumar	Director
3.	Shri Srinivasulu Gunda	Director

WITNESSES

Sl. No.	Name
1.	Shri Katyayani Shankar Bajpai
2.	Major General (Dr.) G. D. Bakshi, SM, VSM (Retd.)

2. At the outset, Chairperson welcomed the Members to the sitting of the Committee and briefed them about the subject matter to be discussed in the Sitting. The Chairperson thereafter directed to call Shri Katyayani Shankar Bajpai, Former Diplomat.

3. The Chairperson welcomed the witness and drew his attention to Direction 55 (1) of Directions by the Speaker, Lok Sabha, regarding confidentiality of the proceedings of the Committee. After introduction, the Chairperson asked the witness to brief the Committee on the subject 'Preparedness of Armed Forces-Defence Production and Procurement'. Shri Bajpai briefed the Committee about the structural problems in Defence Preparedness, Production and Procurement etc. He emphasized on the need for stable tenure of the bureaucrats to ensure proper understanding and their meaningful contribution to the policy making in defence related matters.

The Committee adjourned for tea break.

4. Resuming the discussion, the Chairperson welcomed another Defence expert Major General (Dr.) G. D. Bakshi, SM, VSM (Retd.) and drew his attention to Direction 55(1) of Directions by the Speaker, Lok Sabha regarding confidentiality of the proceedings of the sitting. Dr. Bakshi briefed the Committee about the emerging geo-political situations around the world impacting Indian Security, need for urgent phasing out of old Soviet era weaponry and replacing it with modern ones, need for development of in house defence production by involving Private sector, increase in defence budget. He also impressed upon the need for urgent acquisition of armaments for the forces, strengthening of Air power of the country and strengthening diplomatic relation with other countries in the neighborhood of China.

5. The Members raised several queries and sought clarifications concerning the above aspects from the witnesses. The witnesses gave clarifications on most of the points raised by the Members. The Chairperson also requested the witnesses to furnish relevant information on the subject to the Committee Secretariat at the earliest.

6. The verbatim proceedings were kept on record.

The Committee then adjourned.

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MINUTES OF THIRD SITTING OF THE COMMITTEE ON ESTIMATES (2017-18)

The Committee sat on Wednesday, the 21st June, 2017 from 1500hrs to 1800hrs in Room No. 53, Parliament House, New Delhi.

PRESENT

Dr. Murli Manohar Joshi – Chairperson

Members

2. Shri A. Arunmozhithevan
3. Shri Aswini Kumar Choubey
4. Col. Sonaram Choudhary
5. Shri Sanjay Dhotre
6. Shri P. C. Gaddigoudar
7. Shri Prakash B. Hukkeri
8. Smt. Kavitha Kalvakuntla
9. Dr. Sanjay Jaiswal
10. Shri Nanabhou Falgunrao Patole
11. Dr. Bhagirath Prasad
12. Shri Y. V. Reddy
13. Shri Arvind Sawant
14. Shri Janardan Singh Sigriwal
15. Shri Jai Prakash Narayan Yadav

SECRETARIAT

1. Shri Vipin Kumar - Director
2. Shri R. C. Sharma - Deputy Secretary

WITNESSES

Ministry of Defence

Sl. No.	Name	Designation
1.	Shri Ashok Kumar Gupta	Secretary (Defence Production)
2.	Air Marshal S. B. Deo	Vice Chief of Air Staff
3.	Smt. Smita Nagraj	DG (Acq)

4.	Shri S. C. Bajpai	DGOF &Chairman
5.	Shri S K Kohli	FA (DS)
6.	Lt. Gen. RR Nibhorkar	MGO
7.	Air Marshal R Nambiar	Dy Chief of Air Staff
8.	Dr. G. Satheesh Reddy	Scientific Advisor to Raksha Mantri
9.	Dr. Zakwan Ahmed	OS & DG (R&M)
10	Shri Vijayendra	JS (NS)
11.	Smt. Kusum Singh	JS (P&C)
12.	Shri Sanjay Garg	JS (DIP)
13.	Shri Chandraker Bharti	JS (Aero)
14.	Shri Sanjay Prasad	JS (LS)
15.	Shri Rajiv Sen	Economic Advisor
16.	Shri A N Das	Additional FA & JS
17	RAdm (Retd) Shekhar Mital	CMD, GSL
18.	RAdm V. K. Saxena	CMD, GRSE
19.	RAdm D K Tripathi	ACNS (P&P)
20	Shri V Udaya Bhaskar	CMD, BDL
21.	Shri Kaveri Rangarajan	CEO, HAL
22.	Shri M. D. Gowtama	CMD, BEL
23.	Shri D K Hota	CMD, BEML
24.	Dr. D K Likhi	CMD, MIDHANI
25	Cmde Rakesh Anand	CMD, MDL

2. At the outset, the Chairperson briefed the Members about the subject matter and its importance to be discussed during the sitting and then directed that the representatives of the Ministry of Defence be called in.

3. The Chairperson welcomed the witnesses and drew their attention to Direction 55 (1) of Directions by the Speaker, Lok Sabha, regarding confidentiality of the proceedings of the Committee. The Committee a took serious view on inordinate delay in furnishing the replies to the List of Points on the subject by the Ministry. Secretary(Defence Production) tendered his apology for not furnishing the replies on time. The representatives of the Ministry of Defence gave a power point presentation on the subject 'Preparedness of Armed Forces- Defence Production and Procurement'.

4. The Committee expressed their serious concern over unduly long time taken in defence equipment procurements, substandard quality of research work in DRDO Laboratories, inadequate quantities of War Wastage Reserve, lack of production orders to HAL, low/poor quality of production in DPSUs and shortage of manpower in DPSUs. The Committee emphasized that Defence Production and Defence R&D are key to economic and sustainable development of the country. They also emphasized the need for exploring the possibility of exporting the products of DPSUs for their long term sustainability and associating universities/colleges for research work in defence and other fields.

5. The representatives of Ministry answered to the queries raised by the Members. The Chairperson, thereafter, directed the witnesses to furnish information on the queries on which information was not readily available with them to the Committee Secretariat at the earliest.

The witnesses then withdrew.

6. The verbatim proceedings were kept on record.

The Committee then adjourned.

MINUTES OF THE THIRD SITTING OF THE COMMITTEE ON ESTIMATES (2018-19)

The Committee sat on Tuesday, 22 May, 2018 from 1430 hrs. to 1500 hrs. in Room No. 53, Parliament House, New Delhi.

PRESENT

Dr. Murli Manohar Joshi – Chairperson

Members

2 Shri George Baker
3 Shri Kalyan Banerjee
4 Shri Ramesh Bidhuri
5 Shri Dushyant Chautala
6 Col. Sonaram Choudhary
7 Shri Sanjay Dhotre
8 Shri Nishikant Dubey
9 Shri Kaushalendra Kumar
10 Shri P. Kumar
11 Shri Rajesh Pandey
12 Shri Ravindra Kumar Pandey
13 Dr. Bhagirath Prasad
14 Shri Arvind Sawant
15 Shri Jugal Kishore Sharma
16 Shri Jay Prakash Narayan Yadav

SECRETARIAT

1. Smt. Sudesh Luthra - Additional Secretary
2. Shri N.C. Gupta - Joint Secretary
3. Shri Santosh Kumar - Additional Director

At the outset, the Chairperson welcomed the Members to the sitting of the Committee. The Committee then took up the draft Report on the subject Preparedness of Armed Forces - Defence Production and Procurement' pertaining to the Ministry of Defence for consideration. The Committee discussed and adopted the draft Report with some additions to Para Nos. 22 & 23, as suggested by Shri Nishikant Dubey, Member of the Committee, as given in the Annexure and authorised the Chairperson to finalize the draft Report on the basis of factual verification by the Ministry of Defence and present the same to Lok Sabha.

The Committee, then, adjourned.