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STANDING COMMITTEE ON DEFENCE

(2016-2017)

(SIXTEENTH LOK SABHA)

MINISTRY OF DEFENCE

DEMANDS FOR GRANTS (2017-18)

ORDNANCE FACTORIES, DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION, DIRECTORATE GENERAL OF QUALITY ASSURANCE AND NATIONAL CADET CORPS

(DEMAND NO. 20)

THIRTIETH REPORT

LOK SABHA SECRETARIAT

NEW DELHI

March, 2017 / Phalguna, 1938 (Saka)

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(DEMAND NO. 20)

Presented to Lok Sabha on 09 .03.2017

Laid in Rajya Sabha on .03.2017

LOK SABHA SECRETARIAT

NEW DELHI

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10. Dr Subramanian Swamy
11.@ Shri Om Prakash Mathur

*** Nominated w.e.f on 13.02.2017**
**** Ceased to be Member of the Committee w.e.f. 13.02.2017**
$ Ceased to be Member of the Committee w.e.f. 23.11.2016
 # Nominated w.e.f. 02.01.2017
@ Ceased to be Member of the Committee w.e.f. 10.10.2016
^ Nominated w.e.f. 10.10.2016

SECRETARIAT

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3	Smt. Jyochnamayi Sinha	-	Additional Director
4	Shri Rahul Singh	-	Under Secretary
5	Shri Harish Chandra	-	Executive Assistant

INTRODUCTION

I, the Chairperson of the Standing Committee on Defence (2016-17), having been authorised by the Committee, present this Thirtieth Report on 'Demands for Grants of the Ministry of Defence for the year 2017-18 pertaining to Revenue Budget of Ordnance Factories, Defence Research and Development Organisation, DGQA and NCC (Demand No. 20)'.

2. The Demands for Grants of the Ministry of Defence were laid on 9 February, 2017 in Lok Sabha. The Committee took evidence of the representatives of the Ministry of Defence on 22 and 23 February, 2017. The draft Report was considered and adopted by the Committee at their Sitting held on 3 March, 2017.

3. The Committee wish to express their thanks to the officers of the Ministry of Defence and representatives of the three Services for appearing before the Committee and furnishing the material and information which the Committee desired in connection with examination of the Demands for Grants.

4. For facility of reference and convenience, Observations/Recommendations of the Committee have been printed in bold letters in Part II of the Report.

New Delhi
07 March, 2017
16 Phalguna, 1938 (Saka)

MAJ GEN B C KHANDURI, AVSM (RETD)
Chairperson
Standing Committee on Defence

REPORT

PART-I

CHAPTER -I

ORDNANCE FACTORY BOARD

Ordnance Factories are an integrated base for indigenous production of Defence equipment and ammunition and form the backbone of the country's Defence production. Defence production is a highly specialized sector, full of complexities and challenges where products have to be safe, reliable, consistent and capable of operating under varying terrains as well as climates and in extreme conditions. Accordingly, the technologies applied, which cover a wide spectrum of engineering, metallurgy, chemical, textile, leather, optical technologies etc. have to ensure high quality and productivity, apart from meeting the primary objective of self-reliance. Ordnance Factories also fulfill certain requirements of Paramilitary and Police Forces for arms, ammunition, clothing and equipment. Ordnance Factories endeavour to enhance their capacity utilization not only by securing orders from the Defence forces but also through sustained efforts in diversification to non-Defence customers and exports. However, priority of the Ordnance Factories is indigenous production of Defence products only.

1.2 They produce a wide range of arms and ammunitions for the Infantry, Armoured Corps, Artillery, Air Defence Artillery and Engineer Corps of the Army. Ordnance Factories produce ammunition for Navy and Air Force and have taken up indigenous development of Naval armaments. The factories produce military transport vehicles, infantry combat vehicles, armoured vehicles, optical and opto-electronic instruments, summer and winter uniforms, parachutes, miscellaneous leather goods and general stores. To summaries the role of Ordnance Factory Board include to provide a dedicated manufacturing base for military hardware, indigenization and TOT absorption, maintenance of `War Reserve' capacity and `Life Cycle' support to arms and ammunition supplied etc.

1.3 The Ordnance Factories Organization is a blend of old and state-of-the-art factories, with the first Ordnance Factory established in 1801 at Cossipore, near Kolkata, and two new ordnance factories are coming up at Nalanda in Bihar and Korwa in UP. At present Ordnance Factories manage 41 manufacturing units and 32 other establishments. Ordnance Factories have been continuously upgrading their infrastructure, with induction of state-of-art technologies to meet futuristic requirements of users.

'41 Ordnance Factories are divided into 5 operating divisions, based on the main products/technologies employed:

i) Ammunition & Explosives – 11 Factories.
ii) Weapons vehicles & Equipments - 11 Factories.
iii) Armoured vehicles – 6 Factories.
iv) Ordnance equipment - 5 Factories.
v) Materials & components – 8 Factories.'

1.4 The allocations provided at BE, RE during the year 2016-17 and at BE 2017-18 are as under:-

SALIENT FEATURES OF OFB BUDGET		BE 2016-17	RE 2016-17	BE 2017-18
-Revenue Expenditure Account				
1.	Income/Revenue from supplies to Defence and Non-Defence	15764.96	15393.56	17387.95
2.	Other Income/Receipts	150.11	165.11	165.77
3.	Transfer from RR Fund	450.00	450.00	475.00
	A. Total Income/Receipts	16365.07	16008.67	18028.72
4.	Expenditure on Salary	6656.13	6741.11	7212.99
5.	Expenditure on Material, Electricity and other Misc. Admn Expenses	10026.55	9800.00	11050.00
6.	Renewal & Replacement	450.00	450.00	475.00
7.	Transfer to RR Fund	450.00	450.00	475.00
	B. Total Revenue Expenditure	17582.68	17441.11	19212.99
8.	**Net Revenue(Deficit(-)/Surplus(+)(A-B)**	-1217.61	-1432.44	-1184.27
-Capital Expenditure Account				
1.	New Civil Works towards creation of new facilities at OFKR, OFN and other Factories	229.67	309.67	302.00
2.	New Plant and Machinery towards Modernisation	490.00	394.61	471.68
3.	Stockpile of Material	16.01	11.01	30.00
4	**Total Capital Budget**	735.68	715.29	803.68
Net Revenue and Capital		**1953.29**	**2147.73**	**1987.95**

1.5 The Capital Expenditure and Revenue Expenditure of Ordnance Factories from the year 2011-12 to 2016-17 is as under:

Budget Utilisation

(Rupees in crore)

Year	Capital Expenditure			Revenue Expenditure		
	BE	RE	Actual	BE	RE	Actual
2011-12	400	300	278	11640	12470	12141
2012-13	400	400	349	13015	12114	11936
2013-14	436	466	465	13856	13124	12834
2014-15	1207	660	746	14317	14237	12832
2015-16	760	500	680	14706	15377	14133
2016-17	736	704	704 (Expected)	17583	17441	17441 (Expected)

1.6 The Ministry was asked how Ordnance Factories earn their profits and about the profit percentage charged from the Services. The Ministry of Defence through a written note stated as under:-

> 'The pricing policy adopted by Ordnance Factory Board (OFB) ensures realization of cost of production from the Services on overall basis. The issue prices are predetermined and fixed well in advance of the effecting year and actual cost is available nearly 20 months after fixation of the prices. Due to fluctuation in actual discharge load and target as well as market conditions, there may be minor under-recovery or over-recovery, which is beyond control. Surpluses, if any, generated by OFB are incidental and goes back to Government of India to be used elsewhere.
>
> No profit percentage is charged from the services. It is generally maintained that price of services' items is fixed on "NO PROFIT NO LOSS" basis.'

1.7 On the allocation of funds to various Ordnance Factories and the methodology being adopted for distribution of funds, the Ministry of Defence stated as under:-

> 'On receipt of orders from different indentors, OFB compiles the total order and Division-wise target of production are planned. The factories, based on the target of production, forward the Budget requirements estimated by them duly filled up in a standard proforma and duly vetted by Local Accounts Office. Finance/Budget Division of OFB examines/reviews the Budget Estimates of the factories keeping in view the following points:
>
> a) Target of production as approved by Planning Divisions and Operating Division.
>
> b) Details of Inventory held by the factory in the form of
>
> i) Store-in-Hand (SIH)3
>
> ii) Work in Progress (WIP)
>
> iii) Finished Articles/Finished Components

iv) Store-in-Transit (SIT)

c) Trend of Expenditure vis-a-vis Value of Issue

An Annual Budget Meeting is organised with various factories at OFB HQrs to resolve issues related to budget projections.'

Budget for modernization

1.8 The Committee enquired about the details of the outlay provided and spent by all Ordnance Factories along with complete details of each project/programme proposed, planned and implemented during the last five years on modernization, the Ministry of Defence stated as under:-

'During the last five years (2011-2015), total outlay (Budget Estimate/BE) provided and the actual expenditure are given below:-

(Rs in crore)

Expenditure Head	Financial Year	Capital outlay provided	Actual Expenditure
M&E	2011- 2012	169.99	153.35
	2012- 2013	107.02	90.42
	2013- 2014	251.27	239.21
	2014- 2015	381.96	485.73
	2015- 2016	234.00	312.29
	Sub- Total	1144.24	1281.00
Works	2011- 2012	272	267.11
	2012- 2013	270	265.13
	2013- 2014	221.82	219.94
	2014- 2015	314.96	300.66
	2015- 2016	343.00	339.45
	Sub- Total	1421.78	1392.29
RR	2011- 2012	325	310.25
	2012- 2013	500	415.85
	2013- 2014	699.36	697.01
	2014- 2015	620	562.57
	2015- 2016	400	385.73
	Sub- Total	2544.36	2371.41
Total		5110.38	5044.70

The details of the Expenditure in respect of various projects both in Machine & Equipment(M&E) and Works during last five years by all Ordnance Factories is given as under:-

(A) M&E (Rs in Crore)

Sl. No.	Project	2011-	2012-	2013-	2014-	2015-

		12	13	14	15	16
1	T- 72 OH	0.2	0.51	0.08		
2	T- 90 100 Nos.	5.4	3.28			
3	MBT Arjun	0				
4	Pinaka @1000	13.7				
5	T- 72 Variants	0	6.02	62.57	45.33	14.39
6	Wide Armour Plate (Midhani)	94.06				
7	Aug of Engines - 750 Nos.	0.2	7.04	10.28	13.17	27.12
8	Aug of T-90 (100 to 140)		5.69	10.87	71.61	31.09
9	Spares for T-72 & T-90 OH		26.65	60.69	34.03	33.69
10	MPV	2.86	9.07	2.75	1.66	0.16
11	CPE Itarsi	0.73		0.07	4.95	
12	LPR Khamaria					
13	Large calibre Weapon			41.2	9.56	41.5
14	HMX Plant			6.89	29.29	12.26
15	NG Plant	0.72	0.04	0.07	0	
16	Akash Booster & Sustainer			0.18	3.66	2.37
17	Pinaka @5000			0.36	19.1	36.41
18	Ordnance Factory Nalanda	11.86	5.05	17.62	0.47	2.78
19	Ordnance factory Project Korwa	23.4	25.01	21.64	44.2	8.17
20	125mm FSAPDS (mango)	0			79.99	23.47
21	Ammonium Perchlorate					2.96
22	General NC	9.7	14.09	16	20.9	25.46
23	**Total of Projects**	**162.83**	**102.45**	**251.27**	**377.92**	**261.83**

(B) Works

	Head	2011-12	2012-13	2013-14	2014-15	2015-16
1	MES	76.00	118.18	112.52	69.35	67.56
2	Departmental	120.90	114.95	85.76	125.49	55.08
3	DRDO	68.00	32.00	20.59	66.23	196.46

4	920/37 (Land /compensation)	0.00	0.00	1.07	39.59	0.00
5	Charged	2.21	0.00	0.00	0.00	21.01
6	**Total**	**267.11**	**265.13**	**219.94**	**300.66**	**340.11**

The Expenditure in respect of Renewal and Replacement (RR) Plant & Machinery (P&M) is meant for replacement of existing outlived P&M as per five year plan to sustain the existing capacity. This is met through RR fund which is self generated fund of OFB and not a part of capital outlay.'

1.9 During oral evidence, the Committee asked about the operational activities undertaken on modernisation by investing about Rs. 5000 crore. The representatives of the Ordnance Factory Board replied as under:

'We have almost completely changed the conventional CNC machines in most of the core areas. Where some of the heat treatment processes run for more than 36 hours, we have introduced the time recorder to accurately monitor the process so that it remains under control and so the quality of the produce is result and as a result we do not need too many layers of supervision.'

1.10 On delay of projects, reasons thereof, and the current status of enhancement of capacity of OFs, the Ministry has stated as under:-

Current status of on-going projects of OFB

(Rupees in crore)

Project	Annual Capacity		Expenditure till Dec'2016 (Rupees in crore)	Anticipated date of completion
	Existing	proposed		
1	2	3	4	5
T-72 Variants Sanctioned Date: 25.08.10 Sanctioned Cost: Rs.279.63 Completion date as per sanction: Mar'2013	0	50 Nos.	190.04	Dec'2017
Spares for T-72 & T-90 Sanctioned Date: 06.10.10 Sanctioned Cost: Rs.367.52 Completion date as per sanction: Dec'2013	T-72 Tanks -72 & T-90 Tanks-0 set	T-72 Tanks -72-120 & T-90 Tanks-0-50 sets	212.28	Sep'17
750 Engine Sanctioned Date: 25.08.10 Sanctioned Cost: Rs 350.56 Completion date as per sanction	353Nos	750Nos	81.59	Jun'18

Mar'2013				
Aug of T-90 Tanks(100-140) Sanctioned Date: 21.09.11 Sanctioned Cost: Rs 971.36 Completion date as per sanction: Mar'2014	100Nos	140Nos	173.1	Dec'18
Ammonium Perclorate Sanctioned Date: 29.11.10 Sanctioned Cost: Rs 26.48 Completion date as per sanction: Jul'2012	0	220MT/ Anmm	12.4	Aug'17
HMX Plant Sanctioned Date: 01.03.12 Sanctioned Cost: Rs 59.96 Completion date as per sanction: Dec'2016	0	45MT/ Anmm	48.44	Jun'17
Akash Booster& Sustainer Sanctioned Date: 08.12.11 Sanctioned Cost: Rs 105.78 Completion date as per sanction: Mar'2014	150 Nos	500 Nos	10.82	Dec'18
Pinaka@5000 Sanctioned Date: 05.04.13 Sanctioned Cost: Rs 1262.6 Completion date as per sanction: Oct'2015	1000 Nos	5000 Nos	424.97	Sep'18
O F Nalanda Sanctioned Date: 29.11.2001 (Revised)-05.02.2009 Sanctioned Cost: Rs 2160 Completion date as per sanction: Nov'2005 (original)	0	8Lakhs BMCS	669.1	Mar'19
LCW Sanctioned Date: 09.03.12 Sanctioned Cost: Rs 376.55 Completion date as per sanction: Mar'2015	300 Nos	500 Nos	127.74	Jun'18
O F Korwa Sanctioned Date: 25.10.07 Sanctioned Cost: Rs 408.01 Completion date as per sanction:Oct'2010	0	45,000 Nos	408.01	Mar'17
MPV Sanctioned Date: 06.09.10Sanctioned Cost: Rs. 21.06 Completion date as per	0	300 Nos	18.65	Mar'17

sanction:Jun'2013				

Reasons for major delay during this period were due to (i) delay in completion of civil works and (ii) delay in procurement of machinery and equipments.'

The Ministry further informed that major civil works are envisaged under various projects. The execution of works, takes long time which results in delay in project completion. Sometimes procurement of M&E is also a long lead time process. Several problems encountered at different stages as mentioned under:

'(i) <u>Tendering Stage</u>

a) There is limited vendor base since majority of the machine requirements are for customized Special Purpose Machines (SPMs)/tooled up machine and very few offers are received. To have better competition the Tender Opening Date (TOD) gets extended several times.

b) Non- availability of technology like, Forging plant, Chemical plants, Metallurgical plants indigenously. In such cases Global participation is required.

c) Explosive plants have very limited global sources.

d) Retendering of number of cases to avoid Resultant Single Tender (RST) situation.

e) Because of financial crisis in Europe, during this period some of the European suppliers failed to respond to our TE leading to retendering of the cases.

f) The P&M procurement manual during that period had no provision for advance payment. Hence, many suppliers of such machines which were cost intensive did not participate in Tender Enquiry (TE).

(ii) <u>Supply Stage</u>

a) Being customised SPMs/tooled up machines, delay occurred on the part of P&M supplier in design, manufacture & supply of the machine.

b) M/s Hindustan Machine Tools (HMT) is one of the major suppliers of the machine tools to OFs. HMT has not been able to supply machines to OFB within delivery schedule.

c) Because of financial crisis, during this period some of the suppliers in Europe failed to execute the supply timely.

(e) Because of above reasons, i.e. (i) re-tendering of cases and (ii) delay in supply by the supplier, the actual execution could not be completed within schedule.

(iii) Erection & Commissioning Stage

Availability of Building and Services was delayed due to delayed execution of civil works by Military Engineering Services (MES), resulting in long time taken for erection and commissioning of various machines.'

1.11 On being asked about the support being provided to Ordnance Factories by Ministry of Defence by way of budget outlay, etc. the information is as under:-

Budget outlay for 2016-17 is as under:

(Rs in Crore)

	BE 2016-17	RE 2016- 17	Actual Exp. up to Dec'16
Machinery & Equipment (M&E)	490.00	394.61	138.36
Works	229.67	309.67	165.06
Stockpile	16.01	11.01	-
Total	**735.68**	**715.29**	**303.42**

Budget outlay for 2017-18 is as under:

(Rs in Crore)

	BE 2017-18 (Projection)
Machinery& Equipment (M&E)	1041.67
Works	498.00
Charged (Stockpile)	2.00
Total	**1541.67**

Expenditure on Research & Development

1.12 The Committee enquired about the in-house Research and Development conducted in Ordnance Factories for development of new products and the percentage of expenditure in Research and Development to the overall allocations during each of the last five years, the Ministry in its reply submitted as under:

'In-house Research & Development is conducted in Ordnance Factories for development of new products.

The Percentage of Expenditure in Research & Development to overall allocations (Value of Issue) during last five years is as follows:

(Rs in Crore)

	2011-12	2012-13	2013-14	2014-15	2015-16
Expenditure in R&D	35.68	48.02	42.72	55.82	87.97
Overall Allocation (Value of Issue)	12391	11974	11123	11354	13047

Percentage	0.29	0.4	0.38	0.50	0.67

1.13 On the issue of new products/projects being formulated/launched and outsourcing of Research and Development work done by OFB, the Ministry in its written reply has stated as under:

> 'OFB has taken up in-house R&D projects for Indigenous Design and Development of Futuristic Infantry Combat Vehicle (FICV), Air Defence Gun, Electronic Fuze, 7.62x51 mm Assault Rifle, 155/52mm MGS, Dhanush SP Gun etc.
>
> OFB is doing collaborative Research and Development work with reputed Government Institutions of the Country. List of Institutions from which Research Assistance is being taken are:
>
> (a) IIT Bombay
>
> (b) IIT Delhi
>
> (c) IIT Madras
>
> (d) IIT Kharagpur
>
> (e) IIT Kanpur
>
> (f) CIPET etc.'

Products developed by Ordnance Factories

1.14 The Ministry was asked to give the break-up of the total value of products supplied to the three Services, the Ministry in its written note has stated as under:

> 'Supplies to the three Services made during the last two years and current year target and corresponding achievement up to December, 16 is appended below:

(Rs in crore)

Year	2014-15	2015-16	RE Target 2016-17	Achievement upto Dec'16
Services				
Army	9097.78	10496.97	12897.73	7510.10
Navy	215.27	299.96	238.12	136.46
Air Force	347.41	419.28	467.54	360.54
Total	**9660.46**	**11216.21**	**13603.39**	**8007.10**

Indigenization

1.15 The Ministry was asked to furnish the details of the effective steps taken to quantify the level of indigenization in Defence equipment in Ordnance Factories, the Ministry in its written reply has stated as under:-

'Indigenisation of Defence Stores is a major thrust area of OFB and is carried out either through Transfer of Technology (TOT) from Foreign Original Equipment's Manufacturers (OEMs)/DRDO or through in-house R&D. The steps taken to enhance the Indigenisation level in OFB products are furnished as under:

To progress indigenization and TOT absorption in a time bound manner, dedicated Task Forces have been constituted in factories and progress is being reviewed regularly at the highest level of OFB.

Interactive Workshop cum exhibition to display all the imported items at one place with detailed specifications was organized at Heavy Vehicles Factory, Avadi, Chennai and the same is planned to be repeated as well as replicated at other units also.

OFB has also undertaken several projects for design and development through in-house R&D as well as in association with DRDO with a primary objective of import substitution.

The value of indigenisation vis-a-vis value of supplies for the last three years is as under:

(Rs in Crore)

Year	**Value of Supply**	**Value of indigenous content**	**% of Indigenous content**
2013-14	11123	9438	84.85%
2014-15	11364	10347	91.10%
2015-16	13047	11391	87.30%

1.16 The Ministry furnished the details of indigenous production of Defence equipment designed and developed by the OFs vis-a-vis the imported ones, as under:

'Indigenisation details for major projects are as under :

Name of Project	**Present level of indigenization as of Dec'16**	**Planned level of indigenisation**	**Status of indigenisation**
AK-630 Naval Gun	92.78 %	95.6 %	Out of 27 codes (main systems) pertaining to OFB, 24 codes have been indigenized. Indigenized Main Gun AO-18 is planned to be proof fired by Mar'17
Tank T-90	69.5 %	98.5 %	Further indigenisation process commenced after receipt of 2nd Indent of 236 Nos in Dec' 2013
40 mm PFFC	71.85 %	100 %	A task force is working for complete indigenization of end Store by Dec'17. MED, Battery and SAD remain to be indigenized
84mm HEAT-551	85.87%	100 %	Rocket Motor Charge, Base Plate, Safety Spring & Octol are being developed through in house & trade sources

Delay in supply of items produced by Ordnance Factories

1.17 On delay in supply of items to the Forces and the system in place to bring accountability in case of such delay, the Ministry in its written reply stated as under:-

'OFB has made supplies as per mutually agreed targets to Defence to fulfill Defence preparedness.

(i) **T-90 Tank:** Supply of T-90 (Ind) Tanks to Army is delayed for the last 2 years due to Radiator Problem. It was observed that the Tanks fitted with Radiators were getting over heated (coolant temperature rising upto 120°C). Issue of T-90 Tanks was suspended w.e.f. July 2013 due to radiator design and overheating issues. On analysis it was found that Russian OEM, came out with improved design of Radiators (New Design) which has better heat dissipation (28% higher heat transfer capacity). In the Collegiate Meeting held on 13th Nov'2014 under the Chairmanship of Master General of Ordinance (MGO), it was decided to replace with Radiators (ex-import) of new design. Accordingly, a Contract was placed on Russian OEM.

Presently, radiators (ex-import) were imported from Russia. After receipt, the radiators were fitted in the Tanks and are being issued to Army after all trials and Joint Recent Inspection (JRI). As on date 256 (Ind) Tanks out of 300 (Ind) were supplied to Army. Balance 44 (Ind) Tanks would be supplied by Mar'2017.

(ii) **Ammunition:** OFB was supplying based on yearly target received from various indenters upto 2008-09, there have been very minimal slippages. However, in 2010, AHQ vide letter dtd 22/01/10 projected their requirements in the form of "Roll-on-Indent" for 2009-14 as per their deficiency to meet the MARL (Minimum Acceptable Risk Level) requirement which was much higher than the capacity available with OFB. OFB accepted the higher challenging target considering the fact that the additional requirement of AHQ would be met by obtaining product support from Indian trade firms, foreign OEMs and also through capacity augmentation. OFB has achieved 35% growth in 2015-16 compared to 2014-15 which is unprecedented as per industry standards which shows its commitment to meet the requirement of Armed Forces.

In the first Roll-On-Indent (2009-14) out of total 97 items, slippage was only in respect of 21 nos of items which were critical. As per the second "Roll on Indent", out of the total 160 items of ammunition of Army, indent has been placed for 82 items only, out of which no problem is anticipated in supply of 62 items and for 8 items problem is beyond the control of OFB e.g. demand reduction by AHQ, design issue etc. OFB is anticipating problems only in 12 items for which various capacity augmentation measures have been taken like ToT taken for 125mm FSAPDS, product support being taken from OEM for 30mm ammunition, capacity augmentation in-house and support from Indian trade sources.

Based on supplies in 2014-15 & 2015-16 the slippages of critical items have been reduced to 14 from 21. The ammunition items where supplies have improved:

155mm Charge M4A2
105mm IFG HE
84mm HEAT 551
84mm HE
84mm TPT
6. 81mm PWP
7. 81mm HE

OFB Supply Plan by Value

Balance from 1st Roll on Indent (09-14) Value	-	Rs 6,958 Crores
2nd Roll on Indent (14-19) Value	-	Rs 19,517 Crores
Total	-	Rs 26,475 Crores

OFB plan of issue

(Rs in Crore)

Year	Roll-On-Indent (14-19)	OFB Plan (Including Back Log)	Achievement
2014-15	1725	4268	3979
2015-16	3720	4695	4848
2016-17	4373	5211	
2017-18	4772	5785	
2018-19	4927	6717	
Total	19517	26475	

Stock Analysis of Major Ammn Items (Army) (Based on Data of Army Hq as on 30.06.16)

Sl. No.	Stock Position as on 30th June'16	No. of items targeted during Roll-On-Indent 14-19	No Problems Anticipated by OFB	Problems Anticipated by OFB	Problem Beyond control of OFB	Remark
1	40 I	15	15	0	0	9 items demand reduced by AHQ
2	≥30 I and < 40 I	11	9	1	1	2 items demand reduced by AHQ
3	≥20 I and <30 I	19	14	4	1	1 item demand reduced
4	<20 I	21	13	6	2	
5	Trg	10	10	0	0	1 item demand reduced
6	Stock not avl	06	1	1	4	1 item design issue. 3 items indent cancelled by AHQ
	TOTAL	82	62	12	8	

No. of items where problems anticipated by OFB

Sl. No.	Ammn	Stock levels as on 30-06-16	Action Taken
1	125MM HE	25.27 (I)	Production stopped by AHQ Limited BPC to mfr 20K given NOC for import given for 65,443 OFB plans to supply 1L by 18-19
2	125MM HEAT	30.55 (I)	Capacity constraint to mfr SCCC(F) NOC for import given for 62002 OFB plans to supply 75K by 18-19
3	120MM MOR HE	24.18 (I)	Capacity constraint to mfr H/W from Indian Trade firms More sources under development OFB plans to supply 1.5L upto 2018-19
4	DET NO.4 SEC DELAY	4.07 (I)	Capacity constraint due to high man-power intensive Indian Trade firms have developed this items NOC accorded for 6.13L. Further NOC given for 24,00,000 on dt:24-10-2016 Planned to supply 3L p/a from 2016-17
5	81MM SMK PWP	21.88 (I)	Manufacture, handling and transportation of this ammunition is highly fire hazardous OFDR has been given a task to fill the ammunition with Hexachloro-Ethane based composition which is safe to handle. Further augmentation will be after successful filling 50K planned from 2016-17 and onwards
6	81MM MOR ILLG	22.01 (I)	Mfr of time fuze at trade firms are the main constraint. Effort is being made to develop at Ordnance Factory and new trade firms Planned to supply 50K p/a from 2016-17
7	30MM HE/I	-2.95 (I)	Limited demand projected to OFB for last few years Fuze A670M is the main constraint to augment the capacity Effort is being made for importing fuze from JSC Rosoboron
8	30MM HE/T	11.82 (I)	
9	120MM SMK PWP	15.81 (I)	Ban was imposed on established vendor. Fresh vendors are being developed Planned 5K pa from 2016-17 considering manufacture, handling and transportation of this ammunition being highly fire hazardous
10	CTG 9 MM BALL	11.48 (I)	Very high demand from MHA units Priority was given to MHA after discussion with AHQ Capacity augmentation planned at OFV for further 400 lakhs
11	FUZE B-429 FOR 130MM	2.94 (I)	No target was projected for few years Item has to be re-established Effort is being made to develop this item NOC given for 2.5 Lakhs Product support from OEM for 2.5 lakhs is being taken Production at OFCH will restart after successful completion of Failure Review Board
12	MINE APNM 14		Quality problem with input material (empty plastic mine body- Micro crack observed).Matter is being resolved through Alteration Committee.

The details of the products delayed are given above. It may be noted that despite the constraints faced by OFB for achieving targets like fluctuation of demand by AHQ, failure of established source to supply, long lead time for source development etc., concerted efforts are being made to fulfill the requirements of the User.

The delay is mainly attributable to the reasons which are beyond the control of OFB.

The performance of Ordnance factories is reviewed regularly by OFB at the level of Operating Divisions and also by concerned Members and Chairman/OFB. Matters related to Production, Procurement, Quality etc are discussed in detail in Production Review meetings held at OFB with the concerned Factories and measures are taken to resolve identified issues. It is pertinent to bring out that the production achievement during 2015-16 was highest ever due to continuous monitoring and mid course correction, wherever required.'

1.18 The Ministry was asked about the extent to which the delays in supply of items produced by Ordnance Factories have affected the Defence preparedness of the country. The Ministry in its written reply stated as under:-

'While delay in supply happens sometimes due to factors like non-availability of inputs from trade sources in time, quality issues in supplies received from trade, delay in proof clearance (BPC), change of drawing/design etc. However, in such circumstances the User procures such items from alternate indigenous and/or foreign sources to maintain operation preparedness of the Army at desired level.'

Quality Check in Ordnance Factories

1.19 On being asked about quality check conducted by Ordnance Factories and second party inspection so as to avoid defective ammunition reach in the hands of Army, the Ministry in its written reply stated as under:-

'OFB supplies ammunition to Indian Army duly inspected by Quality Control department of factory as well as DGQA (2nd Party Inspection Agency). The following tests are carried for a batch of ammunition production to ensure quality:

All input materials are tested in designated laboratories. 100% dimensional checking is done by factory

Sampling dimensional checking is done by DGQA

On an average, 21 lab tests are conducted by factory and DGQA

On an average, 4% rounds are fired by DGQA as part of dynamic firing

The ammunition batch is accepted and issued to Army only after it passes all the above tests. However, in spite of maintaining stringent checks of quality, during bulk exploitation of above ammunition by user, some defects/accidents are observed sometime. Important reasons for the defect in performance of ammunition are:

Manufacturing deficiencies

Improper handling and storage of ammunition in ammunition depots

Improper maintenance of weapon system in weapon depots

Improper handling of ammunition and weapons during firing

In addition to above, reliability of design always remains an issue.

Responsibility of OFB is to manufacturing and up to dispatching of ammunition to Army and responsibility of storage, handling, maintenance of ammunitions lies with the Army which are equally responsible for defects/accidents.

Unlike other products, ammunition is single-use item. For this reason, 100% inspection including dynamic proof cannot be carried out. A principle of Statistical Quality Control (SQC) is employed for final acceptance of ammunition. SQC is inherently associated with both Producer's risk and Customer's risk. Hence such problems may surface during the process of exploitation.

System of accelerated exploitation of ammunition has been introduced for last two years, to have early feedback on performance of Ammunition. As per reports received on accelerated exploitation from Army, the performance of the ammunition has been found to be satisfactory.'

Manpower in Ordnance Factories

1.20 As regard to the authorised and existing strength of manpower in all Ordnance Factories both technical and non-technical for the last five years, the Ministry in its written note furnished to the Committee stated as under:-

TECHNICAL

	Sanctioned Strength	Existing Strength					
Year		**Apr-12**	**Apr-13**	**Apr-14**	**Apr-15**	**Apr-16**	**Jan-17**
Industrial Employees	94598	56579	56873	55492	54075	51826	50547
Labour	8000	6993	7029	6859	6683	6405	6247
Chargeman (T)	10083	7083	7186	7249	7166	7349	7580
Junior Works Manager (T)	5780	5505	5561	5424	4815	5282	5201
Para-Medical	1507	1354	1311	1250	1278	1227	1235
TOTAL (TECH)	**119968**	**77514**	**77960**	**76274**	**74017**	**72089**	**70810**

NON TECHNICAL

	Sanctioned Strength	Existing Strength					
YEAR		Apr-12	Apr-13	Apr-14	Apr-15	Apr-16	Jan-17
Non Industrial Employees	18226	16034	15442	15161	14647	12753	12232
Chargeman (NT)	2002	1717	1644	1633	1606	1536	1598
Junior Works Manager (NT)	1476	652	607	556	527	676	653
HQ Min	850	711	727	696	629	615	600
TOTAL (NT)	**22554**	**19114**	**18420**	**18046**	**17409**	**15580**	**15083**

Grp A	Sanctioned Strength	Existing Strength
IOFS	2570	1474
IOFHS	283	231
Asst Dir (OL)	39	22
Matron	45	45
Principle Gr I & II	23	15
Staff Officer	14	14
PPS	7	7
Total	**2981**	**1808**

SYNOPSIS		
Category	Sanctioned Strength	Existing Strength as on 01-01-2017
Technical	119968	70810
Non-Technical	22554	15083
Grp A	2981	1808
	145503	87701

Note: The strength of Group 'A' to the tune of 2981 has been part of OFB proposal out of the strength of 145503, which has been granted approval of MoD. The process of revising strength to the tune of approval has to be taken separately by OFB.

1.21 On being asked about whether there has been any shortage of both technical and non-technical manpower in Ordnance Factories and if yes, what steps have been taken by Ordnance Factory Board to overcome the shortage, the Ministry in its written note furnished to the committee stated as under:-

'With regard to the shortage/shortfall in existing strength as against sanctioned strength, 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. Further, promotions to the Employees are given based on the sanctioned strength of each cadre. As such the sanctioned strength is required for maintaining a healthy career progression of the work force while the existing strength is maintained to meet the work load requirements.

However, manpower is being sanctioned every year in respect of all categories of employees based on vacancies available in the recruitment grade and work load requirement. Last manpower sanction for direct recruitment in various technical & non-technical posts (total 4033 IEs & 965 NIEs) was accorded in May, 2016. Action has also been initiated for recruitment of 846 number of Chargeman.

Also, the last exercise of manpower planning for Ordnance Factories was carried out by a Manpower Rationalisation Committee. The Committee recommended reduction of total sanctioned strength of Ordnance Factory Organisation from 163103 to 145503, which has already been approved by MoD. The sanctioned strength of Industrial Employees was revised from 99505 to 94598 and has already been redistributed amongst all Ordnance Factories. The revision of strength in respect of other categories of employees is under process.'

Restructuring of Ordnance Factories

1.22 On being asked by the Committee regarding restructuring of Ordnance Factories and provision of budget for the same, the Ministry stated as under:

'At present, there is no such plan for restructuring of Ordnance Factories. Hence, no budgetary provisions have been planned for the same.'

CHAPTER - II

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION

Defence Research & Development Organization has come a long way since its modest beginning in 1958. Starting with only 10 laboratories, DRDO has grown multi-dimensionally and has evolved to be a core research organization with a vast network of 52 laboratories and establishments spread across the country. With a vision to empower India with cutting-edge technologies and equip our Services with internationally competitive systems, DRDO has proven its competence to produce state-of-the-art strategic and tactical military hardware and related technologies in diverse disciplines such as Aeronautics, Armaments, Combat Vehicles, Combat Engineering, Electronics, Missiles, Life Sciences, Materials and Naval Systems. At the core of this technological strength of DRDO is its expertise in system design, system integration, testing and evaluation and project management built over the last five decades, which has enabled it in developing indigenous capabilities in weapons and their delivery systems.

2.2 DRDO plays significant roles to provide scientific and technological advice on aspects of weapons, platforms surveillance to the Ministry of Defence in support of Defence policy; as evaluator of Defence equipment for the military operational requirements and generating new technological knowledge to be transferred for development of state-of-the-art weapon systems by the Defence industries; to carry out research and cutting edge technology development for building a strong indigenous technology base; to design, develop and lead to production state-of-the-art sensors, weapons systems, platforms and allied equipments for our Defence Services; to support National Cyber Security Architecture –testing capabilities, security solutions, testing hardware, indigenous NW systems, Defence tools, support operations. The Organization also advises the Government to make technical assessments of international security threats and the military capabilities of both current and potential adversaries.

Budgetary Provisions

2.3 Budget Estimates (projection and allocation) and Revised Estimates (allocation) in respect of Department of Defence Research and Development for the last five years and Budget Estimate for the year 2017-18 are given in the following table.

Year	Budget Estimate(BE) (Rs in Cr)		Revised Estimate(RE) (Rs in Cr)
	Projection	Allocation	Final Allocation
2012 – 13	14463.66	10635.56	9884.94
2013 - 14	16483.28	10610.17	10934.17
2014 - 15	18495.46	15282.92	13716.14
2015-16	19641.56	14358.49	13540.11
2016 - 17	18782.86	13593.78	13454.54
2017 - 18	19935.60	14818.74	

2.4 The percentage of expenditure in Defence Research & Development to the overall Gross Domestic Product (GDP) during the last five years and current financial year is given below:

Total GDP vs Defence R&D Expenditure (Rs. in Cr)			
Year	**Total GDP***	**Defence R&D Expenditure**	**Defence R&D Expenditure (as % of Total GDP)**
2012 – 13	*9226879.00[2R]	9794.80	0.10
2013 – 14	*9839434.00[2R]	10868.88	0.11
2014 – 15	*10552151.00[1R]	13257.98	0.12
2015 – 16	*11350962.00	13277.28	0.11
2016 – 17 (BE)	Not Available	13593.78	

**(Based on Economy Survey 2015-16)*
2R-2nd Revision, 1R-1st Revision, AE-Advance Estimates

No authentic information is available on expenditure on Defence R & D as a percentage of GDP in respect of Developed Countries.

Budgetary Allocation

2.5 The Ministry was asked about the plans made by DRDO for development of new weapon systems in this year's Budget, the Ministry in its written reply stated as under:-

> 'DRDO is involved in the development of new technologies & systems in domain areas of missiles, aeronautical systems, armaments & combat engineering systems, naval systems, electronics & communication systems etc. Some of the new weapons systems in testing phase are: New Generation Anti Radiation Missiles (NGARM), Quick Reaction Surface to Air Missile (QRSAM), Man-Portable Anti-Tank Guided Missile (MPATGM), Kautilya, Pralay, Advanced Towed Array Advanced Towed Artillery Gun Systems (ATAGS), 500 kg general purpose bomb, Advanced Light Weight Torpedo, Advance Light Towed Array Sonar (ALTAS), Medium Power Radar (MPR) Arudhra, Nuclear, Biological & Chemical (NBC) products to name a few.
>
> Additionally new projects have also been sanctioned this year for the development of weapon systems for eg. Anti Tank Guided Missile (ATGM) for MBT Arjun Mk-II, corner shot weapon system for pistol and Under Barrel Grenade Launcher(UBGL), Identification of Friend or Foe (IFF) Mk XII(A) system variants, Electric Gun and Turret Drive System (ELEGANT), Akash Mk-1S, Akash New Generation (NG), Supersonic Missile Assisted Release of Torpedo (SMART), Anvesha, RudraM-II, Stand-off Anti-tank Guided Missile (SANT). The total cost of these sanctioned projects is Rs. 2219 Cr. About 65% of DRDO budget is expected to cater to new weapon system development.'

2.6 (a) The Ministry was asked to apprise the Committee how DRDO monitor spending of funds on its projects, the Ministry in its written reply stated as under:-

> 'Monitoring of funds in DRDO projects is carried out throughout the year for optimum utilisation of allocated funds by adopting the following course of action:
>
> - Separate 9 digit Unit Codes for projects costing Rs 2 Cr and above for effective and accurate budget monitoring of Projects.
> - Specific allocation of funds for projects for easy and accurate monitoring.
> - Monthly Expenditure Reports (MERs) by laboratories/establishments
> - Analysis of Monthly Expenditure Reports vis-a vis monthly compilation issued by Controller General Defence Accounts (CGDA) for proper monitoring of expenditure.
> - Periodic review by the concerned Cluster Director General.

- Periodic review by DRDO Management Council (DMC).'

(b) The Ministry was asked to furnish the details of performance audit of work done by scientists/technicians in DRDO, the Ministry in its written reply stated as under:-

The performance of a scientist is assessed through the Annual Performance Appraisal Report of each scientist which contains details of specific targets set for him for the year and his accomplishment by end of the year. Progress is also reviewed during the year through mid-term review. The scientist is also required to make presentation of his achievements before Assessment Board for his career progression in the service.'

Expenditure on Research & Development

2.7 On being asked about the new projects being formulated, the Ministry in its written reply submitted as under:-

'Major new projects being formulated and planned to be taken up in near future are given technology cluster wise:

- **Aeronautics*:*** Full Mission Simulator, High Efficiency High Temperature Turbine, Land Attack Cruise Missile.

- **Armament &Combat Engineering (ACE):** Variants of Wheeled Armoured Personnel Carrier, Wheeled Armoured Platform (WhAP), Chemical, Biological, Radiological and Nuclear(CBRN) (wheeled) recce vehicle, CBRN (Tracked) Mk-II, Magazine Firefighting System for Naval Ships, Next Generation Explosive Reactive Armour, Guided Pinaka, Swarm Robotics.

- **Electronics & Communication Systems (ECS):** Mobile Transhorizon Communication System, Adaptive Algorithms on Experimental Radar Test Bed, Digital Active Phased Array, Compact Airborne Multi Sensor Optronic Payload, Samishti, Advanced GMS & Laser Target Designator (LTD), Next Generation Microwave Receiver Module 'Vamana', Electronic Warfare Suite for LCA Mk-II.

- **Micro Electronic Devices & Computational System (MED&CoS):** Surveillance Using Multilayer Intelligent Tracking Response & Analysis *(*SUMITRA), Ground based High-Power Microwave (HPM)DEW system, Small Intelligent Unmanned Aerial System (SIUAS), Ku-band MBK Transmitter, GaNHEMT MMICs, Multi

PetaflopComputing System, Establishment of Opto-Electronic Devices Enabling Centre.

- **Missile and Strategic System (MSS)*:*** RudraM-III, Submarine Launch Cruise Missile (SLCM).

- **Naval System and Materials (NS&M):** Supersonic Missile Assisted Release of Torpedo (SMART), Compact High Frequency Imaging Technology Prototype (CHITR), Advanced Permanent Magnets for Strategic Applications, Nanotechnology for Radar Absorbing Materials, Advanced Characterization of Nanomaterials.'

2.8 The Ministry was asked to furnish the details of the projection for Twelfth Plan in respect of Research and Development, the Ministry supplied the following information:

'The Projections for XII Plan vs. allocation are presented in the Table below.

Year	Defence Expenditure	Projection	Budget allocated to R&D	%age of Defence Expenditure
2012-13	181776.00	14463.66	9794.80	5.39
2013-14	203499.35	16483.28	10868.88	5.34
2014-15	218694.18	18495.46	13257.98	6.06
2015-16 (RE)	224636.00	19641.56	13277.28	5.91
2016-17 (BE)	249099.00	18782.86	13593.78	5.46

2.9 The Ministry was asked to furnish the reasons for decline, if any , in the allocation made on Research and Development to the total Defence Budget during the Twelfth Plan period and projects which have suffered due to reduced allocation, if any, the Ministry supplied the following information:

'Every year budget requirement is projected by DRDO based on the ongoing projects/programmes and futuristic requirements. Nearly, 80% of total budget is being utilised on Mission Mode (MM) Projects with deliverables for Armed Forces. Short falls in budget affect Technology Demonstration (TD), Science and Technology (S&T), Development of Infrastructure and Facilities (IF), and projects related to Product Support (PS). Due to shortage of funds, projects and other ongoing activities are re-prioritized. Government is making all possible efforts to meet the

budgetary requirement of DRDO, within the available resource, so that its flagship programmes do not suffer due to lack of funds.'

Quality Control

2.10 On the quality check conducted for the products developed by DRDO and whether these projects are state of the art technology, the Ministry supplied the following information:

'Quality checks are conducted for the products developed by DRDO. The following Government Quality Assurance (QA) agencies are authorized to conduct quality check on the products so productionised:-

Indigenous Missile Systems	• Missile System Quality Assurance Agency, Hyderabad (MSQAA)
Products for Indian Army	• Directorate General of Quality Assurance (DGQA)
Products for Indian Air Force	• Directorate General of Aeronautical Quality Assurance (DGAQA)
Products for Indian Navy	• Armament – Directorate General of Naval Armament Inspection (DGNAI) • Others – Directorate of Quality assurance (Warship projects (DQA(WP)) & Directorate of Quality Assurance (Naval) (DQA(N))
Strategic Systems	• Strategic System Quality Assurance Group (SSQAG)

- Indig

Each project (TD/MM) has an internal DRDO QA team. Additionally, MSQAA, DGAQA. DGARA also participate in project reviews and are involved in clearance of DRDO products. A new layer of quality check has recently been added through creation of Dte of QRS at DRDO HQ.'

2.11 The Ministry was asked to furnish the break-up of the total value of items supplied among the three Services, the Ministry supplied the following information:

'The break-up of the total value of items supplied to the three Services and also items which are under induction, as on 31 Dec 2016, is given below.

Products/Systems/Technologies Developed by DRDO Inducted/Under Induction into Services as on 31 Dec 2016		
Service	**Cost (Rs in Cr)**	
	Inducted	**Under Induction**
Indian Army	39503.86	63264.41
Indian Navy	4176.45	25576.29
Indian Air Force	13806.17	93253.97
Other Agencies (Jt Services, MHA, PMF, PSUs)	8654.34	7835.97
Total	66140.82	189930.64
Grand Total (Inducted + Under Induction)	**Rs 256071.46 Cr**	
Note: *Strategic Systems not included.*		

2.12 On being asked about how much foreign exchange money was saved in absolute and relative terms due to products developed by DRDO, the Ministry in written reply stated as under:-

'Production value of DRDO developed products which have been inducted by the Services is approximately Rs 66,141 Cr. Foreign exchange money corresponding to this value has therefore been saved by DRDO, so far.

(This does not include strategic systems)'

Delay in Defence Projects

2.13 On being asked to furnish the position of the major projects of DRDO indicating name of project, date of sanction, original estimated cost of the project, likely date of completion, revised cost of the project, revised date of completion and the money spent on these projects including laboratory-wise categorization, the Ministry in written reply stated as under:-

'Details of major ongoing projects (Cost above Rs. 100 Cr) of DRDO with name of project, developing agency/laboratory, date of sanction, original estimated cost of the project, likely date of completion, revised cost of the project, revised date of completion, and expenditure made are given at ***Annexure "A"'***

2.14 On being asked about the approval of the projects and the key areas of research, the Ministry in written reply stated as under:-

'DRDO projects are dictated basically by two major considerations- the Services Long Term Integrated Perspective Plan (LTIPP) and technology forecasting by DRDO based on global developments. These two combine to give rise to DRDO's Five Year Plans, which fall into 3 major categories:

Mission Mode (MM) Projects: Involving User initiative, time-bound and normally involves more than one lab with Users having a major say in steering the project. This kind of project normally depends on technologies that are already available, proven and readily accessible either within DRDO/India or from abroad at short notice. As time is at a premium, there is normally an alternate/parallel path, which is also selected.

Steps in Mission Mode (MM) Projects

- Formulation of Services Qualitative Requirements (SQRs)
- Prototype development
- Technical trials and limited field trials
- Engineered prototype development
- User assisted technical trials
- Initial production and Transfer of Technology
- Extensive user trials and field evaluation
- Induction of product
- Post induction trials or accelerated user trials
- Full scale production

Technology Demonstration (TD) Projects: Normally initiated by DRDO as feeder technologies for future or imminent projects. These are funded by DRDO. The purpose is to develop, test and demonstrate a particular technology. Modules of this may be developed by industry and design/analysis packages by academia.'

Steps in Technology Demonstration (TD) Project

- Every project proposal (of value greater than Rs 2 Cr) is preceded by 3 major activities-
    - Detailed Feasibility Study
    - Project Evaluation And Readiness Level (PEARL), and
    - Peer Review.

Science & Technology (S&T) Projects: Low level funding solely at lab level with loose alignment to future technology needs. This kind of project is normally taken up with academia involvement and includes a high quantum of research, analysis and simulation modules.

Based on all 3, a final proposal is submitted which covers all aspects of design, analysis & simulation, manufacturing, quality and test & evaluation. The proposal is vetted at multiple levels depending on the value/category of the proposal.

DRDO broadly follows the following development process:

- Break up the planned system/product into its component sub-systems. Identify all technology requirements and assess if available or if it needs to be developed.
- Assess the Technology Readiness Level (TRL) in the country of modules which need to be developed: The TRL table, which is widely followed in USA and Europe has been modified and adapted by DRDO and implemented as Project Evaluation And Readiness Level (PEARL)to assess the availability of technical expertise, infrastructure in the DRDO and country as a whole. This exercise is being done during the preparation of project proposal. This methodology enables the project team to assess the team's confidence in exploiting the national technological resources and organizational expertise and helps to identify technology gaps.

- Work out development strategy, based on DATE of sub-systems, while identifying risk areas and mitigation strategies.
- Identify manufacturing, Quality and testing requirements and plan accordingly.

- Following the sanction of the project, a multi-tier Monitoring and Review process is initiated. This includes quarterly technical review of work completed and gaps/risk areas through PMRCs.

- In addition six monthly Executive Boards and annual Apex Committees oversee the Technology cycle to address various techno-management issues which are likely to crop up.

- Annual targets of projects are broken down in terms of sub activities and these are monitored using the Results Framework Document (RFD) tool by PDs/ Lab Directors/ DGs and HQrs.

  As is evident, DRDO follows a systematic and comprehensive project and technology management process during the development cycle.

Procedural Guidelines

The procedural guidelines for processing of project proposals for project sanction/ PDC extension/ re-appropriation of funds and cost revision is as follows:

- All Project proposals will be first considered in the Cluster Council, before initiation.
- Cluster Council will accord 'in principle' clearance to project proposals based on need and lab competence.
- Thereafter the project will be peer reviewed by national experts for robustness of design and development methodology.
- The proposal will then be presented in DRDO Management Council (DMC) for Acceptance of Necessity (AoN) with respect to user requirements and technology buildup needs.
- Project proposals (cleared 'in principle' by Cluster Council and/or DMC) will then be initiated by the concerned lab after cost vetting by finance for approval of Competent Financial Authority (CFA) on file.

2.15 The Ministry was asked to furnish the reasons for the major projects which have not been completed on time and the steps taken to complete the projects within a stipulated period, the Ministry replied as under:-

'Reasons for the Major Ongoing Cabinet Committee on Security (CCS) Projects running behind schedule and remedial measures/steps taken by DRDO to avoid any further delay are given below:

(a) Light Combat Aircraft (LCA): Full Scale Engineering Development (FSED) Programme - Phase II

- Original Date of Completion : Dec 2008
- Revised Date of Completion : June 2017

Reasons for Delay

- First time development, integration and flight testing of a world class fighter aircraft.
- Complexity of system design and very high safety standards leading to extensive testing to ensure flight safety.
- Due to non-availability of indigenous 'Kaveri Engine' design changes were carried out to accommodate GE404 engine of USA.
- US Sanctions imposed in 1998 also led to delay in importing certain items and developing alternate equipment, since vendors identification and development to production cycle took time.
- Change in the development strategy of radar and associated changes on the aircraft.

- Incorporating configuration changes made by the user (for example R60 Close Combat Missile (CCM) was replaced by R73E CCM which required design modifications) to keep the aircraft contemporary.
- Major development activity of avionics was undertaken in order to make aircraft contemporary, which took time but yielded results.'

Remedial Measures

- LCA (Tejas) Programme is progressing satisfactorily as per the schedules mutually agreed with IAF to meet their requirements. Establishment of Tejas production facilities at HAL for a production rate of eight aircraft per annum is progressing concurrently with development activities.

- Phased development approach was changed to concurrent development approach with a view to reduce overall development time. FSED Phase 2 Development Programme was launched concurrently with FSED Phase 1 Programme in Feb 2000 and also LCA Series Production Programme has been launched concurrently with FSED Phase 2 Programme in Mar 2006.

- Outsourcing development activities extensively.

- Formation of LCA Induction Team (from Indian Air Force) at ADA to improve the interfaces with programme and expedite decision making.

- Deputy Chief of Air Staff is reviewing every month to ensure that the objectives of Tejas Programme are achieved without any further cost and time overrun.

- In addition to the weekly reviews conducted at ADA and the Governing Body & Annual Meetings, the Hon'ble RM has set up an Empowered Committee with the Chief of Air Staff reviewing the programme once in every quarter.

- The issue of Kaveri engine has been delinked from Tejas Production Programme.

- Formation of quick response teams for on-site and shop floor resolution of issues.
- Aircraft production line has started

(More than 3000 flights have been completed till date. Initial Operational Clearance (IOC-I) was achieved in Jan 2011. An important milestone in the long journey towards indigenization and Self-Reliance was attained in Dec 2013 by obtaining Initial Operational Clearance-II wherein "Release to Service Certificate" was handed over to the Chief of Air Staff by RakshaMantri in Bengaluru. First Series Production aircraft has been handed over to chief of Air Staff by RakshaMantri on 17th Jan 2015).

(b) **Full Scale Engineering Development Programme of Naval Light Combat Aircraft (LCA-*Navy) – Phase - I***

- Original Date of Completion : Mar 2010
- Revised Date of Completion : Dec 2016

Reasons for Delay

- The LCA Navy Project being a developmental extension to Air Force trainer, was delayed due to the overall delay in Air Force Programme.

- As the LCA Navy is the first naval carrier borne aircraft being designed and developed in the country by HAL and ADA, it had to overcome following changes:
    - Design for larger structural loads
    - Heavier under carriage
    - Arrester Hook design
    - Front fuselage redesign
    - Inclusion of Levcon Flying Surface.

Remedial Measures

- Phased Development Approach has been changed to Concurrent Engineering Approach.

- Outsourcing the development activities extensively.
- Multi-shifts work.
- Close interaction among developing agency, user and production agency.
- Periodic review of project by DRDO and Navy.

LCA Navy Trainer (NavalPrototype-1): Aircraft has been manufactured and already undergoing flight evaluation. Maiden flight carried out on 7 Feb 2015 and completed 5 successful flights within a span of 10 days. So far,38 flights have been carried out.

LCA Navy Fighter (NavalPrototype-2: Structural assembly of Aircraft has been completed and equipping is in final stage.

Shore Based Test Facility (SBTF): The facility has been commissioned at Naval Air Base at Goa. MiG-29K trials have already been carried out at the facility.

(c) Aero Engine – Kaveri

- Original Date of Completion : Dec 1996
- Revised Date of Completion : Dec 2009 (Under Revision)

Reasons for Delay

- Original Probable Date of Completion (PDC) was quite challenging and not pragmatic, as the assessment of development effort required was inadequate due to lack of experience. At that point of time, this project was conceived as the first indigenous aero-engine development project in the country. Till date, all the aero-engines were either outright purchased or manufactured under license-production and did not provide the required database for estimating realistic time

& cost. However, this project has provided a platform for design, development & testing of an indigenous aero-engine and its variants.

- Non-availability of special materials, like nickel and titanium based alloys.
- Lower priority from foreign manufacturing agencies in view of Minimum Order Quantity vis-a-vis the production order quantity from other engine houses.
- Lack of required manufacturing infrastructure at Indian Vendor's facilities
- Any modification in component/system has a lead time of 18-24 months, due to inherent delays of the procurement process.
- Delayed delivery of components and systems from agencies abroad due to lower priority.
- Induction of Kaveri core engine development and its altitude testing was not envisaged in the beginning but was added at a later stage of the programme.
- Flying Test Bed (FTB) trials was not originally included as a milestone in the project. However, based on the recommendations of the Certification Agency and Air Force, FTB programme was included.
- US Sanctions imposed during 1998 affected the delivery of critical systems.
- Lack of infrastructure for engine testing and component/system level testing within the country.
- Engine and component failure during testing.

  (Kaveri Engine was integrated with IL-76 Aircraft at Gromov Flight Research Institute (GFRI), Russia and flight test was successfully carried out upto 12 km maximum altitude and maximum forward speed of 0.7 Mach No. As on Nov 2016, 2771 hours of engine testing have been completed).

Remedial Measures

- Consortium approach has been used for design, development and fabrication of critical components.
- Three tier project monitoring approach is being followed.
- Phased Development Approach has been changed to Concurrent Engineering Approach.
- Outsourcing development activities extensively.

(d) Airborne Early Warning and Control (AEW&C) System

- Original Date of Completion : Apr 2011
- Revised Date of Completion : June 2017

Reasons for Delay

- 27 Months delay due to projection of additional operational requirements by IAF and finalization by issue of mutually agreed Operational Requirements compliance document.

- Due to additional requirement of Certification of aircraft for operation under icing certification which in turn has necessitated additional design work on Aircraft and Mission Systems thereby delaying the delivery of aircraft.

- A delay of 12 months in reception of first aircraft and 14 months delay in delivery of 2nd aircraft from foreign vendor.

- Estimated 12 months delay in delivery of 3rd aircraft as on date.

  (Aircraft was demonstrated (both static and flight display) in Aero India 2015 during 18 – 22 Feb 2015 at Bengaluru. Flight campaign of AEW&C carried out at Jodhpur during 10-14th May 2016 and 6-10th Jun 2016 to benchmark against the performance of the system.

Remedial Measures

- Progress of activities in parallel.
- Working in multiple shifts.
- Close monitoring of project.

(e) Air-to-Air Missile System – Astra

- Original Date of Completion : Feb 2013
- Revised Date of Completion : Dec 2016

Reasons for Delay

- Delay in receiving first batch of seekers.
- Contract was signed in Aug 2006, however, Russian Presidential approval came only in Nov 2007. Contract effective date commenced from 10 Dec 2007.
- Technology problems leading to major mid-course redesign
- Project is progressing as per revised schedule.

  (Captive flight trials on Su-30 Mk-I for avionics integration have been conducted successfully).

Remedial Measures

- Phased Development Approach has been changed to Concurrent Engineering Approach.
- Consortium approach has been used for design, development and fabrication of critical components.

(f) Long Range Surface-to-Air Missile (LR-SAM)

- Original Date of Completion : May 2012
- Revised Date of Completion : Dec 2016

Reasons for Delay

- Delay in finalization of Installation Control Document and Interface Design Specifications.
- Failure encountered in prototype during hang Fire Test.
- Complexity in technologies.
- Ab-initio development.
- Change in design requirement from Design Authority Israel Aerospace Industries (IAI).
- Technology problems in developing a state of the art pulse motor.
- Redesign of Vertical Launch Unit as per Navy Ship Build requirements.
- Flight testing was linked to delivery of components and equipment.
- Project is progressing as per revised schedule.

Remedial Measures

- Outsourcing the development activities extensively.
- Multi-shifts work.
- Close interaction among user and production agency.
- Periodic review of project by Secretary Defence R & D.

2.16 The Ministry was asked tom furnish the reasons for the cost & time overruns in the DRDO projects and remedial measures adopted to check the cost and time overruns, the Ministry in written reply stated as under:-

'The following are some of the reasons for the cost & time overruns in the DRDO projects:-

- Ab-initio development of the state-of-the-art technologies.
- Non-availability of trained/skilled manpower in respect of ab-initio development projects.
- Non-availability of infrastructure / test facilities in the country.
- Technical/technological complexities.
- Non-availability of critical components/equipment/materials and denial of technologies by the technologically advanced countries.
- Enhanced User's requirements or change in specifications during development.
- Increase in the scope of work.
- Extended/long-drawn user trials.

- Failure of some of the components during testing/trials.

The following are some of the important remedial measures taken by DRDO to check the cost and time overruns in ongoing projects

- DRDO has instituted several review mechanisms to monitor programmes and projects regularly, right from their inception, with active participation of the Services, production agencies, academic/research institutions, etc.
- Three tier management and monitoring mechanism has been adopted for all major projects. In case of mega programmes, inter-ministerial apex board has been constituted to manage and monitor them. DRDO has Apex Management Board, Executive Board, Project Monitoring and Review Committee (PMRC), and Project Review Committee to monitor and review ongoing projects. These Boards and Committees are represented by the developers, users, production agencies, inspection agencies, financial authorities, senior scientists from other scientific organizations, etc. and they review and monitor projects periodically.

For all major programmes/projects, there are multi-tier "Programme Management Boards", having representation from the Services, DRDO laboratories and in some cases from academic institutions and other national research laboratories. These Boards periodically monitor and review the programmes and help in early detection of bottlenecks and suggest mid-course corrective actions, as deemed appropriate. Vice Chief of Army Staff (VCOAS) reviews Staff Projects for Army, twice a year. Deputy Chief of Air Staff(DCAS) is a member of the Engine Development Board; VCOAS, VCNS and DCAS are members of Missile Development Board. Light Combat Aircraft(LCA)Programme is being closely monitored and reviewed by the Governing Body and General Body of ADA. Chassis &Automotive System(CAS) and Central Nervous Stimulating(CNS) are members of General Body of ADA, whereas, Chief of Air Staff (CAS),Vice Chief of Naval Staff (VCNS), Deputy Chief of Naval Staff (DCNS) and Deputy Chief of Air Staff (DCAS) are members of Governing Body of ADA. Similarly, major naval programmes are reviewed by Senior Naval Officers, like VCNS, COM and FO-C-in-C.

The following additional initiatives have been taken by DRDO to restrict future time-over runs in projects:

- Revised Procedures for Project Formulation and Management (PPFM-2016) has been launched with mandatory focus on pre-project activity including completion of preliminary/configuration design and procurement plan before project sanction. This will help in proper planning & then cut down on time delays.
- Tracking of timely completion of reviews – Monthly alerts are being provided to DG cluster on reviews due.'

2.17 The Ministry was asked to furnish the details of the projects delayed and the system in place to bring accountability in case of such delay, the Ministry in written reply stated as under:-

'DRDO has observed that there have been delay in development, trials and production of DRDO developed systems due to various reasons explained in this document while replying to points raised by the Standing Committee (Point Nos 16). After implementation of recommendations of Rama Rao Committee, seven Technology Clusters have been created. Concerned Director General of Technology Cluster has been delegated adequate financial and administrative powersto carry out research and development as per mandate of DRDO. All CCS projects are being monitored by the Cabinet Secretariat through Monthly Report submitted before 10th of every month on status and progress of each CCS Project. "DRDO Management Council(DMC)", chaired by the Secretary, Defence R&D, reviews the progress of ongoing projectsperiodically in which all Director Generals, Additional Financial Advisor, Integrated Financial Advisor are the members of DMC.Problems faced by Project Directors are sorted out then and there to complete projects as per schedule. Online monitoring of projects is being carried out at DRDO HQrs level as well as DG Cluster level to complete ongoing projects on-time.'

2.18 The Ministry was asked to state the extent to which the delays have affected the Defence preparedness of the country, the Ministry in written reply stated as under:-

'There have been some delays in timely completion of projects/programmes by DRDO. However, DRDO systems are contemporary and products worth over Rs. 2.5 lakh Cr have been inducted or are in the process of induction in the Services.'

Indigenisation

2.19 The Committee wanted to know about the details of indigenous production of Defence equipment designed and developed by the DRDO vis-a-vis the imported ones may be furnished to the Committee. In this connection, the Ministry in written reply stated as under:-

'India's Defence requirements in terms of indigenous systems are being taken care of by the Defence Research and Development Organisation (DRDO) which works in providing cutting-edge technologies and systems for the Armed Forces.DRDO has given the country a vast range of products and systems, ranging from the strategic Agni class of missiles, a family of radars and sonars for virtually every platform/application, Electronic Warfare (EW) systems, Main Battle Tank (MBT), combat aircraftand so on.

Technologically advanced countries do not part with their critical technologies to developing countries. These countries offer only "Buy" category of systems to countries, like India. Therefore, we have to develop each system, sub-system, component ab-initioincluding infrastructure and testing facilities. DRDO has made enormous efforts to bring out high level of self reliancein Defence technologies. The

following are some of the major products/systems indigenously developed by DRDO, which has resulted in substantial decrease in import of Defence systems.

Missiles

- Agni Series of Missiles (Range up to 5000 km plus).
- Akash : Medium Range Surface to Air Missile (Range: 25 km)
- BrahMos Supersonic Cruise Missile (Range: 290 km).
- Dhanush : Naval Version of Prithvi Surface to Surface Missile (Range: 250 km).
- Prithvi : Surface-to-Surface Missile (SSM) (Range: 150 km – 350 km).

Armaments

- 105mm FSAPDS ammunitionVijayanta and T-55 (UG) MBTs
- 105mm Indian Field Gun (IFG) & family of ammunition
- 105mm Light Field Gun (LFG)
- 120mm FSAPDS MK-I ammunition for Arjun Tank
- 120mm HESH ammunition for Arjun Tank
- 120mm Main Armament System - MBT Arjun
- 122mm Grad Rocket for BM-21 MBRL
- 125mm FSAPDS MK-I ammunition for T-72/T-90 Tanks
- 125mm FSAPDS MK-I KE Ammunition for T-72 MBT
- 125mm FSAPDS MK-II Ammunition for T-72 Tank
- 30mm AGS-17 HE Grenade ‘Rudra’
- 450 kg / 250 kg HSLD Bomb with RTU and BTU
- 5.56mm INSAS Family : Rifle, LMG & Ammunition
- 51mm Infantry Platoon Mortar & Family of Ammunition
- 7.62mm Self Loading (Ishapore) Rifle
- Bund Blasting Device.
- Family of Mechanical, Electronic & Proximity Fuzes
- Family of Smoke Ammunition for Mortars and Guns
- Fire Detection and Suppression System.
- Fuze FBRN 2I, FBT 3I & 4I for A/C Bombs
- Illuminating Ammunition for 51, 81 & 120mm Mortar & IFG
- Influence Mine, Adrushy.

- Influence Munition Mk-II
- Limpet Munition
- Medium and Short Range ECCM Rockets

- Multi Barrel Rocket Launcher (MBRL), Pinaka (Range: 10 km – 38 km).
- Multi-Mode Hand Grenade.
    - PF, Incendiary and Submunition Warheads for 'Prithvi'
- Portable Handled & Backpack Water Mist System
    - Short Range ASW Rocket
- Under Barrel Grenade Launcher (UBGL).
    - Warheads for Surface to Air Akash Missile

Combat Vehicles & Engineering Systems

- Aircraft Mounted Accessory Gear Box for LCA Tejas
- ArmouredAmbhibious Dozer.
- Armoured Ambulance Tracked (on BMP).
- Armoured Engineer Recce Vehicle (AERV).
- Battery Command Post
- Bridge Layer Tank T-72.
- Bullet Proof Light Vehicle
- Carrier Command Post Tracked (CCPT) on BMP.
- Carrier Mortar Tracked.
- Combat Improved Ajeya (CIA) Tank.
- Gunnery Task Training Simulator
- Launcher
- Light Armoured Troops Carrier
- Main Battle Tank (MBT) Arjun Mk-I.
- Mobile Decontamination System.
- Multispan Mobile Bridging System, Sarvatra.
- NBC Recce Vehicle.
- Operation Theatre on Wheels.
- Replenishment Vehicle
- Riot Control Vehicle
- Unmanned Ground Vehicle.

- Water Cannon.

Aeronautical Systems

- Airborne Early Warning & Control (AEW&C) System.
- Aircraft Arrester Barriers.
- Electronic Warfare Suite for Fighter Aircraft for Mig 27 &Tejas Aircraft.
- Heavy Drop System.
- Light Combat Aircraft (LCA), Tejas.
- Medium Sized Aerostat 2000 m^3 "Akashdeep".

- Parachutes of various Sizes and Capacities
- Pilotless Target Aircraft (PTA), Lakshya-I.
- Remotely Operated Vehicle (ROV), Daksh.
- Remotely Piloted Vehicle (RPV), Nishant.
- Technology for Identification of Friends or Foe

- Unmanned Aerial Vehicle (UAV) Rustom-I.

Electronics& Communication Systems

- 2D-Low Level Light Weight Radar (LLLWR), Bharani.
- 3D-Central Acquisition Radar, Revathi.
- 3D-Low Level Light Weight Radar (LLLWR), Ashlesha.
- 3D-Medium Range Surveillance Radar, Rohini.
- 3D-Tactical Control Radar (TCR).
- Artillery Combat Command & Control System (ACCCS).
- Battle Field Surveillance Radar-Short Range (BFSR-SR).
- Combat Net Radio.
- Command Information Decision Support System (CIDSS), Samvahak.
- Electronic Warfare System, Samyukta for Army.
- Electronic Warfare System, Sangraha for Navy.
- Electronic Warfare System, Varuna for Navy.
    - Inertial Navigation System
- Interception, Monitoring, Direction Finding & Analysis System, Divya Drishti.
- Multifunction Phased Array Radar, Rajendra.
- Night Vision Devices.
- Pulse Compressor Radar, Indra.
- SATCOM Terminals.
- Secured Telephone.
- Servo Valves
- Supervision 2000 Radar.
- Weapon Locating Radar (WLR).

Naval Systems

- Active cum Passive Towed Array Sonar, Nagan.
- Advanced Panoramic Sonar Hull Mounted (APSOH).
- Airborne Dunking Sonar, Mihir.
- Ground Mines
- Hull Mounted Sonar HUMSA.
- Hull Mounted Variable Depth (HUMVAD) Sonar.
- Integrated Submarine Sonar System-USHUS.
- Integrated Submarine Sonar-Panchendriya.
- Low Frequency Dunking Sonar (LFDS).
- Moored Mines.

- New Generation Hull Mounted Sonar HUMSA-NG.
- Torpedo Advanced Light (TAL).
- Torpedo Decoy System.
- Underwater Telephone.

Materials, NBC & Life Sciences Systems

- Armour and Special Steels.
- Bio-digester Toilets
- Combat Free Fall Equipment.
- Flame Retardant.
- Heavy Alloys.
- High Altitude Pulmonary Odema (HAPO) Chamber.
- Integrated Shelters.
- NBC Detection and Protection Items.
- Permafrost Facility
- Submarine Escape Suit.
- Textiles and General Stores.
- Various types of Food Products.
- Water Purification System.

Microelectronic Devices and Computational Systems

- Artificial Intelligence Technologies
- Cyber Security Products
- Data Encryption Technologies
- Microwave Power Modules
- Technologies for Network Management System
- Technologies for Secured Communication

Over the past five decades DRDO has developed a number of systems/products/technologies, a large number of which have been productionised. The value of systems/products/technologies developed by DRDO and inducted into the Services or in the process of induction stands over Rs 2.5 lakh Cr. This figure does not include Strategic Systems.

Products/Systems/Technologies Developed by DRDO Inducted/Under Induction into Services as on 31 Dec 2016		
Systems	**Cost (Rs in Cr)**	
	Inducted	**Under Induction**
Missile Systems	23863.25	55534.62
Electronics and Radar Systems	14010.44	25059.05
Advanced Materials and Composites	4444.28	710.93
Armament Systems	8406.67	19096.12
Aeronautical Systems	598.76	74466.09
Combat Vehicles & Engineering Systems	13235.46	11499.54
Life Sciences Systems	292.21	203.61
Naval Systems	1061.06	3336.62
MED & Computational Systems	228.69	24.07
Total	66140.82	189930.64
Grand Total (Inducted + Under Induction)	**Rs 256071.46**	
Note: Strategic Systems not included.		
Supply order Number reflecting dates of production not available.		

Besides above, DRDO is developing advanced versions of many systems, like Main Battle Tank (MBT)-Mark-II, Rustom-II, Light Combat Aircraft(LCA) Mark-II, Long Range Missiles, etc. Trials of such systems are already going on. Some other major projects are nearing completion. After induction of these systems, our dependency on import will be further reduced. As far as costs of imported systems equivalent to indigenously developed systems are concerned, their costs are considerably higher as compared to indigenous systems.'

Private Sector Participation

2.20 On being asked to furnish a list of the laboratories and projects in which private sector is involved and the technologies developed by DRDO which have been transferred, if any, to Private Sector, the Ministry in written reply stated as under:-

> 'DRDO's products and systems are being developed with partnership of more than 1000 industries including Small and Medium Enterprises (SMEs). The excellent synergy in partnership between DRDO and Industries has led to an enhanced Defence industrial base in the country.
>
> Details of DRDO laboratories/establishments developed products and technologies transferred to private industries during the last five years are given at ***Annexure "B".***
>
> DRDO has come out with the 2nd edition of compendium of industrial partners titled 'DRDO Industry Partnership - Synergy & Growth'. The compendium provides a guide about the core competencies of the industries that will go a long way in strengthening the Government's 'Make in India' initiative.

The 'DRDO Guidelines for Transfer of Technology (ToT)'and the 'Compendium of DRDO Developed Defence Products with Export Potential' were released by Hon'ble Raksha Mantri Shri Manohar Parrikar on 23rd Sep 2015.

In the current year, 50 licensing agreements for ToT to 36 industries were facilitated under category 'A' Technologies. 18NOCs for export have been granted by Ministry of Defence (MoD) based on technology developed by DRDO.'

Products Development by Defence Research and Development Organisation

2.21 Then Ministry was asked whether DRDO consult the user Services before initiating any project, the Ministry replied as under:-

'DRDO has a well established mechanism of regular interaction with the Services to boost up the induction of indigenously developed systems and increase self-reliance of the Armed Forces. Joint reviews of DRDO projects by Secretary DD R&D and Vice Chiefs of the respective three Services and Quarterly Interaction Meetings (QIMs) with all line directorates of Indian Army are conducted regularly to remove bottlenecks and provide necessary guidance to the development team. Indian Navy-DRDO synergy meetings for the long-term requirements of Indian Navy had been initiated and cluster wise meetings are being organized regularly. New projects to be taken up by DRDO laboratories for meeting the User requirements, as projected in the Long Term Integrated Perspective Plan (LTIPP) are being discussed in the various QIMs with Users both before sanction and are reviewed by user during execution.

User is also part of Peer Review for the projects being undertaken with an aim for induction in the Services.

All Mission Mode projects are taken up by DRDO based on the requirements of the Services. The User representative is part of Peer Review, Design Review and Project Monitoring Committees in addition to participation in various phases of trials. Regular monitoring of these projects by the Services are taking place at the Quarterly Interaction Meetings, reviews by Vice Chiefs/Deputy Chiefs and IN-DRDO Synergy meetings.'

2.22 On being asked about how the three services are ensured that they get the latest technologies in conformity with the competitive and dynamic international standards, the Ministry in written reply stated as under:-

'The three Services are ensured that they get the latest technologies in conformity with the competitive and dynamic international standards as follows :-

- Requirement of Armed Forces are met by development of State-of-the-Art Technology Weapon Systems which includes Development of Critical Technologies, Design and Fabrication of Prototype, Testing in Field and Extreme conditions and Transfer of Technologies to Production Agencies leading to Bulk Production and Induction into the Services.

To ensure this, DRDO undertakes the following activities :-

- Analysis of the Services Long Term Integrated Perspective Plan (LTIPP) and mapping/ Synchronization with DRDO Plan.
- Continuously interact with the services to further fine-tune the DRDO Plan.
- Prepare S&T Roadmap.
- Undertake indigenous research and design and development through its Technology Cluster Laboratories invarious disciplines, such as Missiles, Aeronautical Systems, Combat Vehicles, Armaments, Electronics andRadars, Naval Systems andLife Sciences.
- Sponsor Defence oriented Research Activity in reputed and premier Academic Institutions. DRDO also facilitates research in the areas of Aeronautics, Armaments, Naval Sciences& Life Sciencesthrough the four Research Boards.
- DRDO has established Centers of Excellence in various areas, like High Energy Materials, Cryptology, Millimeter Wave and Semiconductor Devices, Aerospace Systems, etc in different Indian Universities and Research Institutions.'

2.23 The Ministry was asked about the contribution of Services towards the Research & Development of high Technology Military Projects, in terms of budget and providing inputs for their operational requirement and also to furnish a list of DRDO projects where the Services have contributed and to the extent of contribution, the Ministry in written note submitted as under:-

'Services have provided document on Long Term Integrated Perspective Plan (LTIPP), which has given inputs about the requirements of Services. Considering the LTIPP, DRDO has prepared a document on Long Term Technology Perspective Plan (LTTPP), which highlights the expected new technology developments in various areas. It is aligned with LTIPP of the Services. The technology development plan covers the 12th, 13thand 14th Five Year Plans (FYP) (2012-2027). The document also covers the new technologies which are not mentioned in LTIPP but will be of interest to Services and covers the period beyond 2027.

Services have provided Qualitative Requirements and valuable inputs to DRDO through following mechanisms of reviews and interactions:

- Quarterly Interaction Meetings (QIM)
- Project Monitoring & Review Committee (PMRC)
- Executive Board Meeting (EBM)
- User Assisted Technical Trails (UATT)
- User Trials

In major Mission Mode (MM) Projects, especially all Strategic programme projects Users i.e. Service Personnel are involved right from the execution. It ensures on job training, immediate modifications as per requirements and state of the art product.

For naval projects, DRDO depends upon Indian Navyto provide platforms such as ships, helicopters and submarines and other logistic support for installation and final sea trials. Navy is also part of different levels system acceptance, like Factory Acceptance Test (FATs), Harbor Acceptance Trials (HATs) and Sea Acceptance Trials (SATs), etc. Similarly, Army and Indian Air Force also provide platforms for trials and actively involved in development trials and training activities.'[

Major Mission Mode Projects are being funded by Services and costs are shared between DRDO and Services. Details of CCS Projects along with the share of the Services are given in the following Table:

S. No	Name of the Programme/ Project	Date of Sanction	DRDO Share (Rs. in Cr)	Share of the Services (Rs. in Cr)	Total Cost (Rs. in Cr)
1.	Light Combat Aircraft (LCA) Air Force Mk-III	Nov 2009	1843.7	729.47	2573.17
2.	Naval Light Combat Aircraft – LCA Navy Mk-I	Mar 2003	1417.22	686.00	2103.22
3.	Naval Light Combat Aircraft – LCA Navy Mk-II	Dec 2009	1152.67	768.44	1921.11
4.	Airborne Early Warning & Control (AEW&C) System	Oct 2004	2180.00	245.00	2425.00
5.	Medium Altitude Long Endurance (MALE) Unmanned Aerial Vehicle (UAV) and Development of Aeronautical Test Range (ATR)	Feb 2011	1225.74	424.00	1649.74
6.	Long Range Surface-to-Air Missile (LR-SAM)	Dec 2005	877.57	1728.45	2606.02
7.	Medium Range Surface to Air Missile (MR-SAM)	Feb 2009	1679.67	8396.01	10075.68
8.	Airborne Warning & Control System (India) AWACS(I) : Phase I	Feb 2013 (in-principle sanction)	1022.60	4090.40	5113.00

2.24 On being asked about the major recommendations of Dr P. Rama Rao Committee and the steps taken by the DRDO to implement these recommendations, the Ministry in written note submitted as under:-

'The major recommendations of Dr P Rama Rao Committee (RRC) are:-

- Introduction of Integrated Financial Advice (IFA) Scheme for financial decentralization in DRDO.

- Creation of Technology Domain based Clusters headed by Director's General.

- Restructuring of DRDO Corporate HQrs.
- Creation of Defence Technology Commission.
- Creation of a Commercial Arm of DRDO to handle spin-off products and technologies meant for civilian use.
- Revamping of HR policies in DRDO.
- Renaming of DG DRDO as Chairman DRDO.

Following steps have been taken by DRDO to implement the accepted recommendations of RRC:-

- IFA scheme for decentralization of finances has been introduced.
- 07 Technology Domain based clusters headed by Directors General have been created.

- DRDO corporate Headquarters has been restructured.
- Revamping of HR policies.
- Renamed the designation of DG, DRDO to Chairman, DRDO.'

Manpower

2.25 As regards to the authorized and existing strength of Scientists in DRDO, the Ministry in a written note furnished to the Committee:

'The authorized and existing strength (as on 31 Dec 2016) of scientists in DRDO is 7878 and 7744, respectively. (This includes Service Officers also).'

2.26 The Committee also desired to know about the number of scientists who have left DRDO during the last five years with the reasons, the Ministry in its written replies stated as under:-

'Number of scientists who resigned from DRDO during the last five years is given below.

Year	No of Scientists Resigned
2012	67
2013	57
2014	33

2015	37
2016	38
Total	**232**

Scientists, who have resigned, have indicated their personal/domestic grounds as the reasons for leaving DRDO.

2.27 The Committee further asked the Ministry about the steps being taken by Defence Research and Development Organisation to put a check on brain drain, if any, in DRDO and to make a career for scientists in DRDO an attractive one, the Ministry explained as under:-

'The trend of resignations of scientists from Defence Research and Development Organisation (DRDO) has declined considerably after the implementation of recommendations of Sixth Central Pay Commission. The number of resignations have now come down to less than 0.5% of the total strength of scientists in DRDO. Government has introduced a comprehensive 'Incentive Scheme for DRDO Scientists', details are given in the succeeding paragraphs. This has also helped in checking the brain drain of scientists from DRDO.

Financial Incentives

- **Additional Increments:** Two additional increments are given to Scientists C, D, E & F at Level 11, 12, 13 & 13A respectively in the Pay Matrix in 7thCentral Pay Commission (CPC) terms.

- **Professional Update Allowance**. Scientist 'B', 'C' & 'D' are granted Rs. 15, 000 p.a., Scientists 'E' & 'F' Rs. 30,000 p.a. and Scientists 'G' & above Rs. 45, 000 p.a. as Professional Update Allowance.

- **Variable Increments**. Up to maximum of six increments are granted to deserving Scientists at the time of promotion under FCS depending upon merit.

Growth related Incentives

To give better growth and promotional avenues to the Scientists in DRDO, Merit based Flexible Complementing Scheme (FCS) is in place, where promotions are based on assessment and not on available vacancies. Under the FCS, Scientist recruited at the level of Sc 'B' in the lowest rung of Gp 'A' can move up to the level of Scientist 'H' in Level 15 Higher Administrative Grade (HAG) scale and thereafter, the level of Distinguished Scientist in the Level 16(HAG+ scale) achievable on personal up-gradation basis.

Proposed Incentives

As regards Performance Related Incentive Scheme(PRIS) it may be mentioned that 7th CPC has not recommended PRIS for DRDO although the same is in operation in Department of Space & Department of Atomic Energy.

Qualification/Skill Improvement

Scientists in DRDO are being sponsored for M.E./M.Tech programmes at Indian Institute of Technologies (IITs), Indian Institute of Science (IISc) and other reputed institutes under the Research & Training Scheme at Government expense so that they can up-grade their knowledge and skills. Further, scientists are also encouraged to complete Ph.D. in their respective field, for which necessary assistance is provided.

Recognition of Contributions

The contributions made by DRDO Scientists are recognized by the Government through various types of Awards being given to these Scientists at the Organization as well as National level. They are nominated to represent the country in Seminars/Conferences Internationally. Scientists are also nominated for Fellowship of various Professional bodies.

Improvement of Working Environment

Mentoring and guiding is a constant interactive process for maintaining a constant level of research standards. Infrastructure and state-of-the-art lab/equipment test facilities, etc are provided to them.'

2.28 DRDO is asking for incentives in line with ISRO and other organisations. In this regard, the Committee asked the Ministry about the profit percentage of DRDO and its comparison with that of ISRO, the Ministry in a written note furnished to the Committee:

'Incentives given to the scientists of Indian Space Research Organization (ISRO), Department of Atomic Energy(DAE) as well as to DRDO are for attracting talent and the same are not linked to profit making which is not the aim of these Departments. At present, there is a disparity in the incentives given to the scientists of these strategic departments. A comparative chart of incentive schemes operational in Department of Space (DOS)/ISRO & DRDO is given below:

Comparative chart of incentive schemes operational in DOS/ISRO & DRDO

S.No.	Details of the Incentive Schemes	DOS /ISRO	DRDO

1.	Incentive of two increments to Scientists/ Engineers at Level 11, 12, 13 and 13A of Pay Matrix as per 7th CPC.	Operational since 1st January 1996.	Operational since 1st January 1996.
2.	Special pay @ Rs.2,000/- in lieu of higher pay scale to Scientists /Engineers at level 14 of Pay Matrix as per 7th CPC.	Operational since 1st January 1996 @ Rs.2,000. After 6th CPC, @ Rs.4,000.	Operational since 1stJanuary 1996 @ Rs.2,000. After 6th CPC @ Rs.4,000.
3.	• Professional Update Allowance for Scientists / Engineers at level 10, 11 and 12 of Pay Matrix as per 7th CPC @ Rs. 15, 000 per annum. • Scientist at the Pay scale of level 13 and 13A of Pay Matrix as per 7th CPC @ Rs. 30, 000 per annum. • Scientists at the Pay scale of level 14, 15, 16 and 17 of Pay Matrix as per 7th CPC @ Rs. 45,000 per annum.	Implemented w.e.f. Oct, 2007	Implemented w.e.f. 1st Sept, 2008 after 6th CPC.
4.	Variable increments at the time of promotion upto six increments for Scientists.	Implemented w.e.f.1st January, 2009	Implemented w.e.f.1st January, 2009
5.	**PRIS – Old Guidelines**		
	• Organisational Incentive @ 20% to all employees (i) with attendance of not less than 150 working days and (ii) ACR should not be "not worth retaining or poor". • Group Incentive @ 10% on achieving set targets.	• PRIS (O) w.e.f. 1st Sept 2008 onwards. **Condition:** Attendance not less than 150 working days. ACR should be average or above. • PRIS (G) approved but not implemented	• PRIS(O) w.e.f. 1st Sept, 2008 not sanctioned • PRIS (G). Not approved.
6.	**PRIS with Revised Guidelines**		
	• PRIS(Organisational) upto 20% with minimum attendance of 175	• PRIS (O) implemented	• PRIS(O) sanctioned

	days. CR Grading Good/B+. • PRIS(G) upto 10% for achieving the set targets. CR Grading should be Very Good or above. Minimum attendance 175 days.	w.e.f. 2010-11. • PRIS (G) not yet implemented.	w.e.f. Financial year 2011-12 linked to achievements in the RFD for year 2011-12. PRIS(O) to be paid out of savings. Not implemented. • PRIS(G) approved w.e.f. 29th Dec, 2012. Not implemented.

The Performance Related Incentive Scheme (PRIS) given to ISRO and DAE is not linked to any profitability, whereas the same has been denied to DRDO scientists with a view that PRIS should be linked to savings/profits.

DRDO is not a profit making Organisation, It has a vision to empower India with cutting-edge technologies and equip our Services with internationally competitive systems. DRDO has proven its competence to produce state-of-the-art strategic and tactical military hardware and related technologies in diverse disciplines such as Aeronautics, Armaments, Combat Vehicles, Combat Engineering, Electronics, Missiles, Cyber Security, Low Intensity Conflict, Life Sciences, NBC Detection and Protection, Advanced Materials, Naval Systems, etc. At the core of this technological strength of DRDO is its expertise in system design, system integration, testing and evaluation and project management built over the last five decades, which have enabled it in developing indigenous capabilities in weapons and their delivery systems. Over the past five decades DRDO has developed a number of systems/products/ technologies, a large number of which have been productionised. The value of systems/products/technologies developed by DRDO and inducted into the Services or in the process of induction stands at over Rs 2.5 lakh Cr. This figure does not include Strategic Systems.

DRDO has transformed into a highly professional Organisation with a strong technology base and management systems to undertake indigenous development of state-of-the-art Defence systems in a holistic manner including design, development, integration and production. DRDO has made the country proud through achievement of technological self-reliance in a number of critical areas including ammunition, armoured systems, missiles, sonar systems, electronic warfare systems, NBC Defence, advanced computing, etc.

Today, India is one of the few countries in the world to have:

- Multi-level Strategic Deterrence capabilities.
- Capability to produce an Inter Continental Ballistic Missile.
- Its own Ballistic Missile Defence (BMD) Programme.
- Developed a Nuclear–Powered Submarine.

- Developed its own Main Battle Tank.
- An Indigenous 4th+ Generation Combat Aircraft.

2.29 (i) On being asked about whether the Defence Research and Development Organization (DRDO) has requested the Ministry of Human Resource Development, the University Grants Commission and other State Governments to bring changes in the education syllabus in order to meet the requirement of skilled manpower for domestic Defence industries, the Ministry in written reply submitted as under:-

'Defence Research & Development Organization has not sent any request to the Ministry of Human Resource Development/University Grants Commission or any State Governments to bring changes in the education syllabus to meet the requirement of skilled manpower for domestic Defence industries. So far, as syllabus of universities is concerned, it is in the purview of Ministry of Human Resource Development(HRD)/University Grants Commission(UGC) to take desired steps. It is understood that the UGC had constituted an Expert Committee to review the existing syllabus of Defence and Strategic Studies at the Under Graduate/Post Graduate and M.Phil./Ph.D levels, and also to suggest the amendments/modifications, deletions/additions in the existing syllabus of Defence and strategic studies. The recommendations of the Expert Committee were ratified by the UGC in its meeting held on 27th April, 2012. Universities, being completely autonomous in academic matters, are free to revise the syllabi and curricula as suggested by the UGC. The UGC has also decided to support the upgrading of the departments of Defence and strategic studies in ten universities in the country during 12th Plan Period. As a follow up action, UGC has invited proposals from five universities recommended by the Expert Committee i.e. University of Allahabad, University of Madras, University of Pune, University of Manipur, and University of Punjab, for up-gradation of existing Department of Defence and Strategic Studies. On its part, DRDO collaborates with various universities/institutions for research & development studies in various fields of Defence science & technology, which in turn leads to human resource development in the country. It is also pertinent to mention that Defence Institute of Advanced Technology (DIAT), a deemed university funded by the Department of Defence Research & Development, also provides M.Tech and Ph.D. programmes in the streams of Strategic Defence importance for participants, from Defence Services and outside.'

(ii) On being asked about how many projects have been initiated by DRDO and since when and the share of a project/scientist/technical manpower in normal circumstances, the Ministry in written reply submitted as under:-

'The total number of new projects sanctioned by DRDO in X, XI and XII FYP including cost are given below:

Plan Period	No. of Projects	Cost of Projects (Rs in Cr)
X FYP (2002-2007)	415	13591.04
XI FYP (2007-2012)	314	24144.76
XII FYP (2012-till date) 10 Jan 2017	321	13005.52
Total	1050	50741.32

Typically, project manpower depends upon cost, scope & category of project undertaken. However, most of the laboratories follow a matrix structure of manpower allocation for projects. Each laboratory has multiple technology groups based on the area of the work of the laboratory. The project has a small core team and most of the technical activities associated with the project is assigned to the technology group in the laboratory or even in other sister laboratories.

Thus a scientist in a technology group may be working on multiple projects wherein that particular technology goes into it. Further, these projects can also be from other DRDO laboratories. It is also not possible to have percentage time allocation for each project for an individual scientist in a technology group.'

2.30 On being asked about the performance audit of the work of scientists of DRDO and the details about the reasons of not having such a thing done so far, the Ministry in written reply stated as under:-

'Performance audit of DRDO laboratories is being done on case-to-case basis by audit authorities during the last few years.

Apart from this, DRDO has been audited by a number of Committees in the recent past as listed below:

- Kelkar committee – suggestions have been implemented
- Rama Rao Committee – suggestions under the purview of DRDO have been implemented. The others have been forwarded to the Government for approval.

- Economic assessment conducted through National Council for Applied Economic Research (NCAER).

The performance of a scientist is assessed through the Annual Performance Appraisal Report of each scientist which contains details of specific targets set for him for the year and his accomplishment by end of the year. Progress is also reviewed during the year through mid-term review. The scientist is also required to make presentation of his achievements before Assessment Board for his career progression in the service.'

2.31 The Ministry was asked to give the details the projects targeted and achieved during 11th Plan and 12th Plan and the present status of these projects, the Ministry replied as under:-

'Details of major projects (cost more thanRs. 100 Cr) sanctioned during 11th and 12th Plan with date of sanction, sanctioned cost and present status are given in the following tables:

Details of major projects (Cost more than Rs. 100 Cr) sanctioned during 11th FYP (01 Apr 2007 – 31 Mar 2012)

S.No	Project	Date of Sanction	SanctionedCost (Rs in Cr.)	Status
1	Medium Range Surface to Air missile (MRSAM) System for Indian Air Force	Feb 2009	10075.68	Ongoing
2	Light Combat Aircraft (LCA)Development Programme : Phase-III	Nov 2009	2573.17	Ongoing
3	Naval Light Combat Aircraft (LCA-Navy Phase-II)	Dec 2009	1921.11	Ongoing
4	Medium Altitude Long Endurance (MALE) Unmanned Aerial Vehicle (UAV) code named Rustom and Development of Aeronautical Test Range (ATR) at Chitradurga (Rustom-II)	Feb 2011	1649.74	Ongoing
5	Active Electronically Scanned Array Radar	Jan 2012	459.65	Ongoing
6	Hypersonic Wind Tunnel(HWT)	Oct 2010	412.00	Ongoing
7	NBC Defence Technologies	Mar 2010	181.65	Under Closure
8	Dual Colour Missile Approach Warning System For Fighter Aircraft	Nov 2008	273.80	Under Closure

9	Land Based Prototype for AIP	Aug 2010	216.60	Under Evaluation
10	40 GHz Upgradation of MMIC Facility	Feb 2012	208.98	Ongoing
11	Advanced Light Weight Torpedo	Feb 2008	194.53	Ongoing
12	Multi Mission Radar	Feb 2012	193.44	Short Closure
13	D-29 System (Internal EW system for MIG-29 Upgrade Aircraft)	Mar 2010	168.85	Under Evaluation
14	Sea keeping and Manoeuvring Basin (SMB)	Sep 2007	168.58	Under Closure
15	Medium Power Radar (MPR) for IAF	Nov 2008	134.14	Under Evaluation
16	Instrumented Airborne Platform for Real-time snow cover,avalanche and glacier monitoring	Sep 2011	125.94	Ongoing
17	Nirbhay- Development Flight Trials	Dec 2010	102.28	Ongoing

Details of major projects (Cost more than Rs. 100 Cr) sanctioned during 12th FYP (01 Apr 2012 – Till date)

S.No	Project	Date of Sanction	SanctionedCost (Rs in Cr.)	Status
1	National Open Air Range	Aug 2014	468.00	Ongoing
2	Quick Reaction Surface To Air Missile (QR-SAM)	Jul 2014	476.43	Ongoing
3	Kautilya	Jul 2012	487.80	Ongoing
4	Development of 1500 hp Engine	Dec 2013	398.02	Ongoing
5	Solid Fuel Ducted Rocket Ramjet Technology for Air Launched Tactical Missiles (SFDR)	Feb 2013	366.00	Ongoing
6	EW Systems for Capital Ships,Aircrafts & Helicopter of Indian Navy titled as `Samudrika`	Jul 2012	342.29	Ongoing
7	New Generation Anti Radiation Missile (NGARM)	Dec 2012	317.20	Ongoing
8	Post Development Support of AEW&C System	Sep 2013	314.32	Ongoing
9	System definition & engineering of DRDO AIP system on P-75 submarines and development of	Jun 2014	270.00	Ongoing

	deliverable lox system			
10	D-Jag System Internal RWJ System for Jaguar DARIN III Upgrade Aircraft	Aug 2012	268.27	Ongoing
11	155 mm / 52 Caliber Advanced Towed Artillery Gun System (ATAGS)	Sep 2012	247.90	Ongoing
12	DRDO - Flying Test Bed	Sep 2012	173.48	Ongoing
13	Submarine Periscope	Mar 2014	163.77	Ongoing
14	Qualification and Certification of DMR-249 Grade Steels, Plates, Bulb Bars and Weld Consumables	Dec 2012	159.30	Ongoing
15	Consultancy for AB3 Steel and Establishment of Indigenous Production	Jan 2013	158.75	Ongoing
16	Augmentation of Environmental Test Facility for warheads and Electronic System	Sep 2013	121.17	Ongoing
17	Advance Light Towed Array Sonar -ALTAS	Apr 2012	114.42	Under Evaluation
18	Technology Development of Engine Fuel Control System (EFCS)	Oct 2014	177.72	Ongoing
19	Collaborative Development of Low Vulnerable High Performance Propellant with Low Temperature Coefficient and Improved Life of Ammunition	Sep 2014	267.02	Ongoing
20	Project Pralay	Mar 2015	332.88	Ongoing
21	Development of Multi-kilowatt Fibre Laser	May 2015	289.55	Ongoing
22	Lead-in Project for Design of GHATAK and Development of Critical advanced Technologies for GHATAK & AMCA	May 2106	231.00	Ongoing
23	AKASH-NG – New Generation	Sept 2016	470.00	Ongoing
24	Development of Supersonic Missile Assisted Release of Torpedo SMART	Nov 2016	340.00	Ongoing
25	Rudra M-II	Mar 2016	489.06	Ongoing
26	ANVESHA	May 2016	479.28	Ongoing

Closed Projects

2.32 The Ministry was asked to furnish the details of closed projects and the money spent on these closed projects, specific reasons for closed projects/dropped projects and the

system in place to bring accountability in case of such closed projects, the Ministry in written reply stated as under:-

'(Over a period of time DRDO has successfully completed many projects/programmes. In DRDO terminology, "closed projects" means "short closed projects" or "dropped projects". The details of projects undertaken by DRDO and recently closed/dropped/abandoned,along with the reasons and cost involved,are given below:-

S. No	Lab	Project	Date of Sanction	Likely Date of Completion	Sanctioned Cost (Rs in Cr)	Expendi-ture (Rs. in Cr)	Reasons for closure
1	ADE	Fabrication of 55 Nos Sudershan Mk-I Kits for Evaluation Trials	Jan12	Jan16	85.13	00.10	Requirement dropped by user
2	CAIR	Semantic Service Oriented Architecture	Jun12	Dec 14	04.90	00.18	Being taken up another project with enhanced scope
3	LRDE	Multi Mission Radar	Feb12	Jun15	193.44	0 6.60	Subsumed in QR-SAM Project
4	RCI	Missile Mass Properties Measurement System	Jun09	Jun13	10.00	05.77	Technical Shortcoming
5	VRDE	Development of 4-Strok Horizontally Opposed 4 Cylinder Engine for UAV	Nov10	Oct15	45.80	02.76	Change in User Requirement from 130 HP Gasoline Engine to 180 HP Diesel Engine

2.33 The Ministry was asked to state the extent to which the closed projects have affected the Defence preparedness of the country, the Ministry in written reply stated as under:-

'Short closed projects have not affected the Defence preparedness as most of them are concept/technology demonstration projects to prove technologies for future development.'

2.34 On being asked about the procedure to update the weapons system designed and developed under Transfer of Technology and in how many projects the Defence labs have updated the system, the Ministry in written reply stated as under:-

'Transfer of Technology (ToT) happens in acquisition cases, under **'Buy and Make with ToT'** where the ToT is acquired by MoD from foreign Original Equipment Manufacturers(OEMs) by paying a cost for the ToT duly negotiated by MoD. DRDO is not involved in these cases as the technology transfer happens directly to the nominated agency under Department of Defence Production(DDP) (DPSUs/Ordnance Factories). Upgrades of weapons systems and the technology are handled by respective Production Agencies directly. However, in a few cases where the problems are faced in the ToT by the Nominated Production Agency, the issue is referred to DRDO by MoD to look into the problems either to resolve the ToTs issue or to take up the upgrades for e.g. Bi Molecular Charge System (BMCS), Su-30 Avionics Upgrades, etc.

Product Support category of projects are taken by DRDO for ToT and production improvement. This category is also used for limited upgrades of existing products already in production. Upgrades also provided by undertaking upgrade, next generation, Phase-II of the project. The list of ongoing product support category projects are as follows :

Sl No.	Project Title	Lab	DoS	PDC	Cost (Rs in Cr)
1	Product support for productionisation of Mine Adrushy Mk-II	ARDE	05-12-14	05-12-17	02.50
2	Manufacture and user evaluation of 125mm FSAPDS (500 mm DoP) Ammunition	ARDE	27-05-14	26-05-17	35.00
3	Post Development Support of AEW&C System (PDSAS)	CABS	09-09-13	08-09-18	314.32
4	Digital Troposcatter/LOS Communication System for IAF	DEAL	30-09-15	29-03-18	04.30
5	USHUS augmentation for reliability (TUSHAR)	NPOL	20-06-14	19-06-17	07.86

PDC : Probable Date of Completion; DoS :Date of Sanction'

2.35 The Ministry was asked to furnish the details of the research programmes being sponsored through universities by the DRDO during 12th Plan and the benefit accrued to DRDO and Defence Services, the Ministry in written note submitted as under:-

'DRDO has instituted Grants-in-Aid schemes to nurture available research talent in universities, academia and other research centres, including industries in the country. The identified projects/ programmes are being funded by DRDO through the followings:-

1. Extramural Research (ER).
2. Aeronautical Research & Development Board (AR & DB).
3. Life Sciences Research Board (LSRB).
4. Naval Research Board (NRB).
5. Armament Research Board (ARMREB).

Basic objectives of the above Schemes/Boards are:-

- To foster knowledge-based growth of Defence related subjects in the country, strengthening and integrating national resources of knowledge, know how, experience, facilities and infrastructure.

- To catalyze the much needed cross-fertilization of ideas and experiences between DRDO and outside experts in scientific and technical fields that contribute to Defence technology.
- To launch and coordinate research in specified areas of Defence in academic institutions.

- To create conditions suitable for attracting talent through research collaborations and other academic exchanges and adopt synergic approach towards National needs and priorities in the field of Defence technology.
- To lead the Technological Innovations useful for Combat Multiplier both for the near and long term.

Details of the number of projects sanctioned under each Scheme/Board, amount sanctioned to various research agencies including academic institutions during 12th Plan are given in the following tables:-

Sl. No.	Name of Scheme/Board	No. of Projects Sanctioned	Total Cost of Sanctioned Projects (Rs. in Cr)
1.	Extramural Research (ER)	197	139.73
2.	Aeronautical Research & Development Board (AR & DB)	146	47.77
3.	Life Sciences Research Board (LSRB)	35	9.185
4.	Naval Research Board (NRB)	112	29.69
5.	Armament Research Board (ARMREB)	16	2.63

DRDO has established three technology centers of excellence at Universities. Three new technology centers are being established at academic institutes. One more technology center will be established in near future.

Details of projects undertaken at the existing centers are furnished below:

1. **DRDO - Bharthiar Centre for Life Sciences**, Bharthiar University, Coimbatore
   No. of projects :16
   Total Cost of Projects:Rs 3.93 Cr.
2. **Advanced Centre of Research in High Energy Materials (ACRHEM),** Hyderabad University.
   No. of projects :32
   Total Cost of Projects:Rs 57 Cr.

3. **Research & Innovation Centre (RIC), Research Park, IIT- Madras**
   No. of Projects: 12(These projects are funded through Extramural Research)
   Total Cost of Projects: Rs 14.48 Cr

Achievements from the Centers of Excellence so far-

A) Research and Innovation Center (RIC) at Research Park, IIT-Madras was established in December 2012.

The center has undertaken total 12 research projects in collaboration with research faculty at IIT-Madras. The center has successfully developed indigenous technology for **Low cost, heavy metal free synthesis of efficient propellant (CL-20) and its derivatives for next generation rockets and missiles**. The technology has been submitted for Indian Patent. Efforts are progressing to transfer the technology to Indian industry for large scale production. Other projects are at various stages of investigation.

B) Advanced Center of Research in High Energy Materials (ACRHEM) at Hyderabad University

The center was established in March 2005.

Basic and applied research undertaken at the center has resulted in the following outcomes:

- Indigenous development of nano Aluminum for application in high burn rate propellant for rocket and missiles.
- Development of new materials for chemical sensors for explosive detection.
- Development of energetic binders for improved performance of propellants.
- Development of materials for thermally stable explosives.
- Development of techniques for Terra Hertz based concealed explosive detection.

Besides, the center has completed 26 research projects successfully and the research outcomes are relevant for design of efficient explosive formulations, insensitive munitions, rocket lining, efficient burn rate solid propellant mixture, innovative testing and characterization techniques etc. and used by major DRDO programs in missile and armament clusters.

C) DRDO- Bharathiar Center for Life Sciences at Bharathiar University, Coimbatore

The center was established in July 2005. Basic and applied research projects undertaken at the center has resulted in the following benefits:

- Development of bio-sensors,
- Micro-fuel cell and gas sensors,
- Molecular approaches for improving human performance at high altitude,
- Environmental toxicity management.

The center is exploring new nano-technology based sensors, plants as source of vaccines, synthesis of novel fluorescent molecules for different applications, activated carbon technology for decontamination and computational biology. All the research outcomes are transferred to DRDO laboratories for application development for the Services.'

2.36 The Ministry was asked to furnish the details of the budgetary provision given to the Universities, their actual allocation and system of monitoring thereon, the Ministry in written note submitted as under:-

'There is no budgetary provision for Universities. Only projects through 'Grants-in-aid' are funded from DRDO.The "Grant-in-aid' programs are monitored by 3-tier review mechanisms. Various Research Panels comprising of domain experts review the proposal and their progress regularly. Besides, the research boards under their Chairpersons and also the DMC- DRDO Apex body review progress of the programs bi-annually.

- Projects costing less than Rs 1 Cr are being monitored by Project Review Committee meetings held yearly.
- Projects costing more than Rs 1 Cr are being monitored by Project Advisory Committee meetings held yearly and Research Programme Implementation Group meetings held half yearly.'

2.37 The Ministry was asked to furnish a list of research development undertaken in collaboration with universities and the status of the developed and the use of the products by the services, the Ministry in written note submitted as under:-

'List of research and development undertaken in collaboration with universities

1. DRDO-DIAT, Pune (2010 – 2015)

   - Program on Nano Materials
2. DRDO – IISc Bangalore (2012 – 2017)

   - Program on Transdisciplinary Shockwave Research & Applications
3. DRDO – JNCASR, Bangalore (2013 – 2017)

   - Collaborative program on Materials
4. DRDO – NIAS, Bangalore (2014 – 2018)

   - Science & Technology Dimensions of National Security

5. DRDO – CR Rao AIMSCS, Hyderabad (2010 – 2015)

   - Software methodologies for Cryptanalysis based on SAT Solvers & Lattice based Approach.

6. DRDO – IISc Bangalore (2014 – 2018)

   - Program to advance frontiers of Communications, Control, Signal Processing and Computation

7. DRDO – IISc, Bangalore (2014 – 2019)

   - An integrated Computational and Experimental approach to Structural Design for Ballistic Impact Blast.

8. DRDO – AMRITA (2014 – 2017)

   - Semantic Analysis & Opinion mining in the Open Data

9. DRDO – IISc, Bangalore (2015 – 2018)

- Silicon Photonic based optical interconnect for advanced high performance computing.

Research undertaken are proof of concept and technology development in niche areas of S&T and the outcome of these form basis for curving out new projects and plugging-in the technology gaps encountered in ongoing R&D activities.'

Brahmos Missile

2.38 The Ministry was asked to give the details of whether the seeker of the BrahMos Missile (joint venture between India and Russia) manufactured by Russia and whether DRDO has made any efforts in developing/manufacturing of seekers indigenously, the Ministry in written note submitted as under:-

'The present seeker of BRAHMOS Missile is being manufactured by Russia. The design & development of new seeker is presently being undertaken by Programme PJ-10, DRDO with involvement of M/S ECIL, Hyderabad and M/S Data Patterns, Chennai. The test and evaluation of prototype seeker designed, developed and manufactured in India is in progress in Defence Research &Development Laboratory (DRDL), Hyderabad. The integration of Indian manufactured seeker with BRAHMOS Missile will be undertaken after successful completion of tests and evaluation against Ship / Land targets.'

CHAPTER III

DIRECTORATE GENERAL QUALITY ASSURANCE

The Directorate General of Quality Assurance (DGQA) is under Department Of Defence Production, Ministry of Defence. This organisation provides Quality Assurance (QA) cover for the entire range of Arms, Ammunitions, Equipments and Stores supplied to Armed Forces. Apart from QA activities, the organisation is responsible for import substitution and associates with Defence Research and Development Organisation

(DRDO) in the development projects. It also ensures Documentation, Codification and Standardisation Action for minimizing the variety of components / equipments. The other services rendered are promotion of small scale industries, Post procurement services, Defect Investigations and Technical Consultancy to the users, Ministry and the Production Agencies. The establishments under this organisation are spread all over the country where mainly the Ordnance Factories, Defence Public Sector undertakings and Industrial base exist. DGQA organisation carries out inspection of Defence stores supplied by Ordnance Factories, DPSUs, Trade Firms and ex-import. These inspections are done at various stages of manufacture and at Final Acceptance stage. On an average DGQA Organisation carries out approx 18,000 inspections per month.

3.2 The DGQA projected it budgetary requirements as under:-

FINANCIAL YEAR (2016-17)

(Values in Crores)

Head	BE	RE	MA (Proj.)	Expenditure till JAN'17
Revenue	1068.10	1077.97	-	877.93
Capital	7.27	9.00	-	6.73
Revenue & Capital	**1075.37**	**1086.97**	**-**	**884.66**

BE: Budget Estimates

RE: Revised Estimates

MA: Modified Appropriations

BUDGET ESTIMATES

(Values in Crores)

Year	Head	Projected	BE	MA	Expended
2015-16	Revenue	1008.30	876.04	931.91	867.73
	Capital	12.00	7.12	11.12	10.57
	Total	1020.30	883.16	943.03	878.30
2016-17	Revenue	1090.99	1068.10	-	877.93*
	Capital	9.00	7.27	-	6.73*
	Total	1099.99	1075.37	-	884.66*

2017-18	Revenue	1292.14	1163.54	-	-
	Capital	15.00	7.97	-	-
	Total	1307.14	1171.51	-	-

BE: Budget Estimates
MA: Modified Appropriations
*** Exp. till Jan'2017**

3.3 When asked if any compromises have been made or are likely to be made due to reduced budgetary allocation, if any, against the projections made by the DGQA. The Ministry in its reply submitted as under:-

'No compromises have been made as budgetary allocations were sufficient'.

3.4 When asked about the information as regards to the details of additional allocation sought by the DGQA. The Ministry in its reply submitted as under:-

'Additional amount of Rs 153.18 Crore has been sought at RE Stage (FY 2016-17) under Revenue and additional amount of Rs 10 Crore has been sought at RE Stage (FY 2016-17) under Capital Works.'

3.5 The Ministry of Defence was asked about the capital and Revenue ratio of the budget allocated for the DGQA for the last five years, the Ministry in its reply submitted as under:-

Requisite information is as under:-

(Rs in Crore)

	2011-2012	**2012-2013**	**2013-2014**	**2014-2015**	**2015-2016**
	BE	BE	BE	BE	BE
Revenue	649.25	796.33	724.75	832.80	876.04
Capital	20.00	20.00	5.45	6.19	7.12
Capital And Revenue Ratio	0.0308	0.0251	0.0075	0.0074	0.0081

3.6 On the procedure adopted by the DGQA in inspection of stores, the Ministry submitted as under:-

'The process of Quality Assurance is carried out by DGQA in following stages:-

(a) Formulating Quality Assurance Plans which include establishing technical specification, acceptance criteria and detailed inspection methodology.

(b) Assessing Quality of the inputs, process & the end product by the following methods:-

(i) Carry out audit of suppliers manufacturing processes and Quality

Management System. Audit the records of internal quality control carried out by Supplier on the inputs material and manufacturing stages of critical stores and subject critical input items to test.

(ii) Process audit to assess the capability of the process to deliver the required Quality output consistently and Control/Surveillance inspection of critical features of product during manufacturing stages.

(iii) Final Acceptance Inspection is carried out as per laid down Quality Assurance Plan during which the product is subjected to dimensional, material, fitment and performance tests. Proof firing is carried out for all arms and ammunition at DGQA ranges before final acceptance.

(iv) Pre Delivery Inspection to assess Quality of imported stores/equipment prior to despatch from country of origin to check for compliance with technical specifications by carrying out tests in accordance with DGQA Acceptance Test Procedures (ATPs). This is followed by Joint Receipt Inspection of the stores on arrival at India before final acceptance.'

3.7 The Ministry submitted the following information on the induction of new system to Army:-

'Whenever a new system is inducted into the Army, DGQA is an integral part of the process and plays a pivotal role in all stages of induction right from the General Staff Qualitative Requirement (GSQR) formulation stage till the Joint Receipt Inspection of the store. The functions performed by DGQA during the various stages of induction are:-

(a) Formulation of General Staff Qualitative Requirement (GSQR). DGQA is responsible for providing technical inputs to service HQ for formulation of General Staff Qualitative Requirement (GSQR) and Request for Proposal (RFP).

(b) Technical Evaluation Committee (TEC). DGQA as part of TEC checks the compliance of the Technical bids in accordance with the RFP.

(c) User Trials. Field trials are carried out by the User in different terrains to validate the performance of the system as per the specific qualitative requirements. DGQA associates during these trials.

(d) DGQA Technical Trials and Environmental Testing. Subsequent to User Trials DGQA carries out independent Technical Trials and environmental testing to ascertain the conformance to the design parameters and reliability of the system. Detailed tests are carried out in DGQA laboratories and Proof Ranges in accordance with the applicable standards. To ensure the consistency in performance for prolonged usage under extreme climatic conditions, the systems and subsystems are subjected to environmental tests in the laboratories.

(e) Finalisation of Specifications. After the system has been shortlisted by the service HQs/MoD for future procurement, DGQA finalises the detailed specifications

and the Acceptance Test Procedures (ATP) based on which the future inspection and acceptance of the system is carried out.

(f) Pre Dispatch Inspection(PDI). DGQA conducts PDI at the vendor premises to assess conformance to detailed specifications as per Acceptance Test Procedure (ATP). In case of imported system Joint Receipt Inspection (JRI) is carried out on its receipt in India, by DGQA.'

3.8 During oral evidence, on the achievements and problem areas of DGQA, the Secretary, Defence Production apprised the Committee as under:

'DGQA load is continuously going up. What we are doing now is that we are also rationalising whether some of the functions of DGQA we can transfer to the manufacturing organisations.

We have started a project in the ordnance factories where we have selected six ordnance factories on pilot basis where intermediate stage inspection control points, surveillance points, all these points, we are handing over to the ordnance factories so that, ultimately, they are responsible for quality control at all the stages and DGQA inspection on behalf of the Army, Navy and Air Force comes only as final acceptance test. This way we are coming out with a model which can be made applicable even in the private sector as private sector is getting encouraged to come to Defence production more and more.

We do not want the DGQA people to go and sit in the private sector at the intermediate stage. They should only do final inspection as is being done in the case of foreign purchases where they go and do the pre-dispatch inspection. So, this is one major change we are bringing about where manufacturing organisation is being made accountable for the entire quality control and even at some critical points, some inspection has to be done. We are also trying to introduce some third party inspection agencies which can give certificates and that certificates can be made acceptable to the DGQA and the user.'

3.9 During oral evidence, when the Committee asked about the inspection being done on Factories by DGQA, the Secretary, Defence Production apprised the Committee as under:

'First of all, some sort of inspection done by the producer is for their own satisfaction. After that, on behalf of the user, either the user or DGQA has to do some sampling inspection.'

3.10 During oral evidence, on being asked what DGQA does when sometimes the product is not as per standard and rejected, the Secretary, Defence Production apprised the Committee as under:

> 'Once DGQA accepts it and we supply to the user, then during the process of usage of that item, if any defect is there, there is no acceptance by the user afterwards. Once DGQA accepts, then user takes it in full quantity and during the usage of the product. If any defect comes out, then it is a different issue like we purchase a refrigerator and all.'

3.11 During oral evidence, when the Committee asked whether DGQA set up can be merged with the producer or not, the Secretary, Defence Production apprised the Committee as under:

> 'Sir, before accepting the entire lot, somebody has to give clearance to supply to the ordnance depots. This clearance is given by the DGQA.'

3.12 During oral evidence, when the Committee asked whether clearance can be given by the producer, the Secretary, Defence Production apprised the Committee as under:

> 'Sir, producer will always say that his product is alright. After that, the second check has to be done on behalf of the user. It is an autonomous organisation. It is independent. Otherwise, the producer will always say that his product his alright.'

3.13 During oral evidence, when the Committee asked about the role of the Defence Ministry, the Secretary, Defence Production apprised the Committee as under:

> 'Sir, functionally, we have given them full autonomy so that, that accusation does not come to us saying that I am controlling DPSUs also. If I control them functionally, in that case, I will try to push DPSU products in spite of bad equality. So, I am saying that functionally they are autonomous.'

CHAPTER -IV

NATIONAL CADET CORPS

National Cadet Corps (NCC) was established under the NCC Act, 1948. Today it has presence in 683 districts of the country with authorised cadet strength of 15 lakhs. NCC aims at developing character, comradeship, discipline, a secular outlook, the spirit of adventure and ideals of selfless service amongst young citizens. Further, it aims at creating a pool of organized, trained and motivated youth with leadership qualities in all walks of life, so that they become useful citizens and serve the Nation with all their might regardless of the career they choose. Needless to say, the NCC also provides an environment conducive to motivating young Indians to join the armed forces. The motto of NCC is 'Unity and Discipline'.

4.2 NCC has a dual funding pattern where both the Central and State Governments meet the expenditure on NCC activities in a properly specified manner. The idea behind sharing of expenditure by the State Governments is to ensure that they too have a sense of participation and belonging in the various activities undertaken by the NCC cadets towards nation building. The Central Government bears expenditure on the following items:-

a Pay & Allowances of Services and Civilian personnel
b Transport expenses
c Expenditure on office accommodation and contingencies in Directorate General, NCC, State NCC Directorates and Training Academies
d Expenditure on equipment, vehicles and clothing
e 75% expenditure on Camp training in all States (except J&K and NER – Sikkim, where it is 100%).

The State Government bears expenditure on:

a Pay & Allowances of State Government Civilian employees posted to NCC
b Office accommodation and Contingencies in NCC group Hqrs and Units
c Allowance for NCC cadets and Associated NCC Officers(ANOs)
f Institutional training in all states (except J&K and NER - Sikkim)
g 25% of camp expenditure in all States (except J&K, NER and Sikkim).

Budget

4.3 The budget of NCC for the last five years as informed during the presentation of the Committee is as under: -

Budget - an overview

(Rupees in crore)

Year/Head	2012-13	2013-14	2014-15	2015-16	2016-17
Pay & Allowances	612.84	703.31	771.10	832.79	994.42
Training	108.50	116.85	107.80	158.83	123.80
Others(Stores, Transportation, Revenue, IT, Capital Works & Acquisition)	100.31	133.90	75.20	92.75	93.58
Total	**821.65**	**954.06**	**954.10**	**1084.37**	**1211.80**

For the Financial Year 2017-18, the projected and allocated amount under sub-head 'Revenue(Salary)', 'Revenue(Non-Salary)' and 'Capital' are as under :-

Budget: 2017-18

(Rupees in crore)

Head	Projection	Allocation	Shortfall
Revenue(Salary)	1175.22	1064.03	111.19
Revenue(Non-Salary)	420.76	227.00	193.76
Capital	68.73	12.40	56.33
Total	**1664.71**	**1303.43**	**361.28**

During oral evidence, the Committee desired to know about the additional requirement of budget, the DG, NCC informed that NCC needs minimum Rs. 86 crore. 30 crore under Revenue non salary and 56.33 under capital budget head. Additional amount shall be required if the uniform case of NCC materialises.

4.4 During deliberations, on being asked by the Committee about what percentage of NCC cadets joined the Defence Forces, the DG, NCC replied as under:

'70 per cent of the subscribed vacancies in the Officers Training Academy are subscribed to by the ex-cadets of the NCC. But also, the NCC can seek entry as recruits or become soldiers in the entire Army. The NCC is in the process of collecting this data and we hope to collate this in the next two months or so. As far as the officers' subscription is concerned, authorised vacancies which are sanctioned by the Government, 70 per cent of them are subscribed to and the reason for non-subscription is the adherence to strict quality control by our selection centres and no other reason.'

4.5 On being asked about the percentage of students from the colleges literally joined as soldiers and the relevance of 'C' certificate, the DG, NCC replied as under:

'The 'C' certificate is still the prime reason which enables you to seek either recruitment or seek a career as an officer in the Army. In other cases you have to appear in a Selection Board and under medical examination.'

4.6 On being asked getting 'C' Certificate examination, the DG, NCC replied as under:

'The number is quite large. It is around 50,000 in a year.'

4.7 On being asked about what steps are being taken whereby you can create interest in the students to join the Defence Forces and are there any effort made by the NCC, he further apprised the Committee as under:-

'These provisions very much exist. They are sufficient in number. For example, in the Army you wish to take a Commission. In the Officers Training Academy, Chennai, you need not appear in the written examination. You can appear for the Selection Board, undergo medical examination and seek Commission. There are 100 seats for male cadets and 08 for women cadets as well. Similar is the provision for the Indian Military Academy, Air Force Academy and Naval Academy. As far as the recruitment is concerned as jawan, if you are a C Certificate holder, you get 100 per cent award in your written examination and you have to basically undergo a basic physical test and medical test and join.

As far as the data is concerned, I mentioned to you 70 per cent of those vacancies which are kept are subscribed to by us. In case of the number of NCC cadets who joined as soldiers, not as officers, this data is in the process of collation and it will take two months or so. It is a massive data which data base we have not had so far. But we will collect it. Not only this, 5 bonus marks are given in the CAPF interview. Whenever a cadet seeks an assignment as Direct Entry, Asst. Commandant. So, these provisions do exist.'

4.8 During oral evidence, the Committee desired to know the number of units in NCC, the DG, NCC replied as under:-

'We have around 814 units in all. 61 units are of Air Force and Navy. Air Force and 60 Naval units have to be next to certain pre-requisites. An Air Force unit has to be next to an air strip where the flying experience can be provided and a naval unit has to be next to a coastal area or a water body where naval training can be imparted readily. The naval establishments and air establishments can support them. Therefore, the numbers of these and the subscription of the youths to these units is a good balance which is drawn. As part of the raising in the coastal areas in Gujarat itself, five new naval units are coming up. Two have already been raised(including one Army unit). The remaining five naval units are under process of raising. So, this number is getting expanded on need basis. Some of the naval units we will have in Thane for example or even in Jharkhand. So, we are trying to cover as much as possible. But it is the naval and Air Force units are restricted by the peculiar requirements of the airfields and the water bodies which restrict their numbers. As far as Artillery, medical units and such like establishments are concerned, the Artillery equipment is now part of the attachment training by the cadets. Attachment

training implies that they go to an establishment which holds artillery equipment. They do a camp and get oriented. Otherwise, the basic training is done in the artillery units. Specialisation is the norm in all battalions now. Specialised training is now being done as part of the attachment training of the cadets. So, the content of the training and exposure is not jeopardised, only the place of imparting training is jeopardised.'

4.9 During oral evidence, the Committee desired to know whether all the States have boys and girls units. What is the waiting list? You can send us that reply in writing. State-wise give us details as to what is the waiting list for additional demands of NCC units. Are funds a problem? The DG, NCC replied as under:-

'We will send it to you. We have it ready. It is 8,627 institutions otherwise. Raising issue depends upon the infrastructure creation and the wherewithal.'

4.10 During oral evidence, the Committee desired to know if a State asks for additional units and you want certain infrastructure, who has to provide it? Is it the State or the Centre? The DG, NCC replied as under:-

'It is the mix of the State and the Centre.'

PART II

OBSERVATIONS/RECOMMENDATIONS ORDNANCE FACTORIES

Budgetary Provisions

1. The Committee, while examining the Demands for Grants 2015-16 and 2016-17 had observed that due to delayed sanction of allocations and cuts imposed at RE stage, the Ordnance Factories Board was compelled to cut short its Committed Liabilities. This resulted in shortfalls in meeting the financial targets. Ordnance Factories Board was reportedly increasing the supplies on the basis of the requirements of the Armed Forces. However, as a consequence of the cut applied at RE stage, and mismatch between the projections and actual allocations, the Board could not produce the equipment as per the orders placed by Army. Therefore, with a view to addressing the problem of shortage of ammunition and vehicles, the Committee laid emphasis on providing adequate budgetary allocation to the Board at RE stage.

2. The Committee are of the view that the lesser than projected allocation being made to DGOF would affect the process of modernisation of Ordnance Factories, which may ultimately result in lower production and may finally affect the quality of products. Therefore, the Committee strongly feel that to improve the working of Ordnance Factories, requisite allocation should be provided to them.

Delays in Projects undertaken by Ordnance Factories Board

3. From the information furnished by the Ministry, the Committee note that delays which are taking place not only pertain to individual projects like T-72 variants, spares for T-72 and T-90, 750 engines, Akash Booster and Sustainer, HMX Plant, Pinaka, Ammonium Percolate, MPVs and LCWs. Delays are also witnessed in regard to construction of Factories at Nalanda and Korwa. The Committee also note

that Ordnance Factories depend to a large extent on Military Engineering Services (MES) for execution of civil works related to their projects. Delay in completion of civil works by MES is one of the major reasons affecting the timely completion of the projects. The Committee view this factor, which is affecting the operational preparedness of Army and other consumers of Ordnance Factories with serious concern.

4. The Committee note that several problems are encountered at different stages. At the tendering Stage, problems arise due to limited vendor base. Since majority of the machine requirements are for customized Special Purpose Machines (SPMs)/tooled up machines, very few offers are received. Therefore, to have better competition, the Tender Opening Date (TOD) gets extended several times. The Committee also find that there is lack of indigenous technology base for Forging, Chemical, Metallurgical and Explosive plants. Thus, in such cases, Global participation is required. Moreover, since the Plants and Machinery (P&M) procurement manual does not have provision for making advance payment, suppliers of machines which are cost intensive do not participate in Tender Enquiry (TE).

5. The Committee desire that the Ministry should try to develop the indigenous industry for Forging, Chemical, Metallurgical and Explosive plants, and introduce the facility of 'advance payment' for reputed business houses, in respect of which there is no provision as of now.

6. The Committee have also observed that at the supply stage delays have been occurring as M/s Hindustan Machine Tools (HMT), one of the major suppliers of the machine tools to OFBs, has not been able to supply machines to OFBs within the delivery schedule. Consequently, re-tendering has to be resorted to. The Committee

desire that the management of HMT should be called upon by the OFB for meetings at the higher level and work out strategies so as to avoid delays.

7. The Committee note that against the required investment of Rs. 2,394 crore in 2016, a substantial amount remained to be expended/invested. Also, during the examination of Demands for Grants of the previous years including 2016-17, the Committee had observed that augmentation of the capacity for manufacturing of T-90 tanks from 100 to 140 nos. was a prioritized item. However, the process has been delayed. The Committee find that lack of planning and co-ordination with the users as the main reason of delay. The Committee desire that the Ministry/OFB should give a serious thought to this matter and take appropriate action so as to avoid such delays at any cost.

Under Spending on Modernization of infrastructure

8. Modernization of infrastructure is a continuous process which needs to be undertaken with a view to update the plants and machineries matching both the qualitative and quantitative requirements of the products projected in the prospective plans. During the years, 2011-12 to 2015-16, the Capital Outlay for modernization programme was Rs. 5110.38 crore, against which the actual expenditure was Rs. 5044.70 crore. Thus, Rs. 65.68 crore remained unutilized. This is despite the fact that Ordnance Factories Board manages 41 manufacturing units where the amount could have been utilized. During the year 2016-17, Rs. 735.68 crore has been provided. The BE for the year 2017-18 is Rs. 803.68 crore. The delays in respect of many important projects like Pinaka Rocket System, T-90 tanks etc. have resulted due to delay in augmentation of capacity for manufacturing by the Ordnance Factories Boards. The Committee are not happy with the pace of modernisation and under-utilization of funds by

Ordnance Factories Board. The Committee opine that optimum utilization should also be given due importance and desire that appropriate steps should be taken to achieve the goals of modernisation.

Manpower in Ordnance Factories

9. The Committee note that Ordnance Factories are suffering from acute shortage of manpower. The Committee found that against a sanctioned strength of 1,19,968 technical personnel in various Ordnance Factories, the actual strength is only 70,810 as on 01.01. 2017. This shows that there is a huge gap of almost 40.97 percent between the sanctioned and actual strength of technical personnel. The existing strength of non-technical staff is only 15,083 as against the sanctioned strength of 22,524. Thus, there is a significant shortfall of 7441 personnel in non-technical staff. Similarly, while the sanctioned strength of Group 'A' officers is 2981, the actual strength is just 1808. Thus, there is a significant shortfall of 1173 Group 'A' officers. The Committee are concerned to note that this huge shortage of manpower in Ordnance Factories, particularly in the technical category will have a negative impact on manufacturing and ensuring improvement in the products. Therefore, the Committee recommend that immediate steps should be taken to bridge the huge gap between the sanctioned and actual strength in order to achieve manufacturing of technically advanced products by Ordnance Factories. The Committee would also like to know as to when the last exercise of manpower planning was conducted, and whether the implications of introduction of modern technologies, including that of computerization of processes on efficiency has been factored for the purpose of manpower planning.

Restructuring of Ordnance Factories

10. The Committee had, in their 9th Report presented earlier, recommended constitution of a high level Committee to go into the functioning and organisational

structure of Ordnance Factories Board and give its recommendations on restructuring of Ordnance Factories so as to make them more professional in meeting the present day requirements. The Committee, however, regret to note that there are no such plans for restructuring of Ordnance Factories. The recommendations of the Kelkar Committee, which has laid emphasized on restructuring of Ordnance Factories have also not been taken cognizance of by the Ministry till date. The Committee express concern on such casual approach of the Ministry and strongly recommend that credence should be accorded to the Kelkar Committee recommendations on restructuring of Ordnance Factories. Action taken in this regard may be intimated to the Committee.

DEFENCE RESEARCH DEVELOPMENT ORGANISATION

Budgetary Provisions

11. The Committee note that there has always been a mismatch between the projected amount and allocations made at the Budget Estimate and Revised Estimate stages and the actual expenditure incurred. During the year, 2017-18, as against the projected demand of Rs. 19,935.60 crore, the allocation, as per the BE is Rs. 14,818.74 crore, which works out to around 74 percent of the projected amount.

12. The Committee also note out of the total Defence Budget the share of DRDO, which was 5.79 percent in the year 2011-12 was reduced to 5.34 percent in 2013-14. The share had slightly improved to 6.5% in 2014 -15, but was again reduced to 5.91% during 2015-16. This has been further reduced to 5.46% during the year 2016-17 and 5.41% during the year 2017-18. The Committee in this regard, express the need for ensuring that the R&D Budget is maintained at a healthy percentage vis-à-vis the overall Defence Budget.

13. The Committee note that the budget requirement is projected by DRDO on the basis of ongoing projects/programmes and future requirements. Nearly 80 per cent of total budget is being utilised on Mission Mode (MM) Projects with deliverables for Armed Forces. Short falls in budget affect Technology Development (TD), Science and Technology (S&T), Development of Infrastructure and Facilities (IF), and projects related to Product Support (PS). Due to shortage of funds, projects and other ongoing activities are re-prioritized. The Committee has been informed in this regard that all possible efforts are being made to meet the budgetary requirement of DRDO, within the available resources, so that its flagship programmes do not suffer due to lack of funds.

14. DRDO is involved in the development of new technologies & systems in domain areas of missiles, aeronautical systems, armaments & combat engineering systems, naval systems, electronics & communication systems etc. Some of the new weapons systems in testing phase are: New Generation Anti Radiation Missiles (NGARM), Quick Reaction Surface to Air Missile (QRSAM), Man-Portable Anti-Tank Guided Missile (MPATGM), Kautilya, Pralay, Advanced Towed Array Advanced Towed Artillery Gun Systems (ATAGS), 500 kg general purpose bomb, Advanced Light Weight Torpedo, Advance Light Towed Array Sonar (ALTAS), Medium Power Radar (MPR)Arudhra, Nuclear, Biological & Chemical (NBC) products to name a few.

15. Additionally, new projects have also been sanctioned this year for the development of weapon systems for eg. Anti Tank Guided Missile (ATGM) for MBT Arjun Mk-II, corner shot weapon system for pistol and Under Barrel Grenade Launcher(UBGL), Identification of Friend or Foe (IFF) Mk XII(A) system variants, Electric Gun and Turret Drive System (ELEGANT), Akash Mk-1S, Akash New Generation (NG), Supersonic Missile Assisted Release of Torpedo (SMART),

Anvesha, RudraM-II, Stand-off Anti-tank Guided Missile (SANT). The total cost of these sanctioned projects is Rs. 2,219 Cr. About 65% of DRDO budget is expected to cater to new weapon system development.

16. Taking into account the aspect of depleting allocation for R&D, both in absolute and percentage terms, as well as the percentage share of R&D activities w.r.t overall R&D Budget, and overall resource crunch of Government of India, the Committee had, in their report on DFG (2016-17) desired that the Ministry explore the possibility of considering the Budget for R&D platform as a sum total of R&D Budget of DRDO, DPSUs and Ordnance Factories as well as Private Sector. The Committee have been informed in this regard that the nature of R&D carried out by DRDO and other agencies have a basic difference. DRDO focus on basic/applied research and technology development where as the focus of the other agencies is more on production/ manufacturing related development. Therefore, requisite flexibility and autonomy to let them decide their areas of interest has been felt to be appropriate. The intention behind the view point expressed by the Committee in this regard is for ensuring that due care is taken to synergize the R&D activities being undertaken by all these organizations in order to avoid duplication of R&D and thereby save on cost & time. The Committee desire that necessary steps be taken in this direction.

17. The Committee also note that DRDO's products and systems are being developed with partnership of more than 1000 industries including small and medium enterprises (S&M). In view of the limitation of funds available with DRDO, the Committee had in their report on DFG (2016-17), emphasise that DRDO needs to mainly play a role in assisting in design and development of the products taken up for manufacture, without spending from its own budget. The Committee note, in this regard that DRDO has pursued the Committee's recommendation in the right earnest in certain cases like the case of development of Rustom-II.

18. It has also been emphasized in `Procedures for Project Formulation and Management' (PPFM), 2016 that a Lab should :

(a) Identify possible production agencies at the stage of formulation of project proposal, if needed, under the proposed project/programme (for Mission Mode projects); and

(b) Identify Development Partners (DPs), if required, and take them into loop right from beginning of project execution.

19. The Committee desire that DRDO should not limit this policy to one or two projects. Rather it should be extended to more projects. The Procedures for Project Formulation & Management (PPFM) 2016 should be strictly implemented. The Committee desire to be informed about the measures taken in this direction.

<u>Delays in Projects</u>

20. There are 93 ongoing major projects in different DRDO labs. These include Agni IV, Agni V, Nirbhay Cruise Missile, K-15, Nag, Astra, AWACS, Arjun Main Battle Tank, Tejas LCA, etc. The Committee are dismayed to note that out of 30 major ongoing projects (costing more than Rs. 100 crore), there have been cost revisions in 06 and time revisions in 16 projects. Besides, 12 projects are more than 5 years old, i.e. sanctioned prior to 2011. While 17 major projects (costing more than Rs. 100 crore) were sanctioned during the 11th Five Year Plan (April 2002 to March 2007), none has yet been completed. Moreover, three of these have been under closure, one under short closure and three under evaluation. The Committee are perturbed to observe that projects being undertaken are not executed as per schedule and inordinate delay in execution of almost all the projects has become a common phenomenon. The Committee, while deploring this attitude, desire that concrete steps be taken to put in place a time-bound mechanism to oversee project execution so that they are implemented in a stipulated time-frame. Steps proposed to be taken in this direction may be intimated to the Committee.

Technological Road Map

21. The Committee note that as per the recommendations made by the Committee, given in their 20th Report on DFG (2016-17), DRDO has drawn out a Technology Road Map given by labs/clusters for a duration of 10 years in blocks of 5 years each i.e. 2016-2020. The Committee desire that DRDO will strictly follow the road map so drawn. The Committee also desire that they may be informed of the outcome.

DIRECTORATE GENERALOF QUALITY ASSURANCE

22. Directorate General of Quality Assurance (DGQA) provides Quality Assurance (QA) cover for the entire range of Arms, Ammunitions, Equipments and Stores supplied to Armed Forces. The organisation is also responsible for import substitution and associates with Defence Research and Development Organisation (DRDO) in the development projects. It also ensures Documentation, Codification and Standardisation Action for minimizing the variety of components / equipments. The other services rendered are promotion of small scale industries, Post Procurement Services, Defect Investigations.

23. The Committee note that for the year 2017-18, DGQA has been allocated Rs. 1,171.51 crore against the projection of Rs. 1307.14 crore. There is a shortfall of Rs. 135.63 crore. The Committee also note that DGQA carries out inspection of Defence stores supplied by Ordnance Factories, DPSUs, Trade Firms and ex-import. These inspections are done at various stages of manufacture and at Final Acceptance stage. On an average, DGQA carries out approx. 18,000 inspections per month. Further, whenever a new system is inducted into the Army, DGQA is an integral part of the process and plays a pivotal role in all stages of induction right from the General Staff Qualitative Requirement (GSQR) formulation stage till the Joint Receipt

Inspection of the store. Since there is a shortfall of Rs. 135.63 crore in budgetary allocation against the projection of DGQA, the Committee would like to know whether any compromises have been made or are likely to made in the functioning of DGQA due to reduced budgetary allocation and if any compromises are made, then, the Committee may be informed of its consequences.

NATIONAL CADET CORPS

24. The Committee note that for 'Revenue Works' in 2017-18, against the projection of NCC of Rs. 19.09 crore for rentals, tariff, carry over works & Spl Works Revenues, the allocation for NCC is Rs. 10.00 crore. As the pending Rentals and Tariffs are to be paid annually, non-Payment may lead to litigation, committed liabilities may not be met and no new revenue works would be taken up in the financial year 2017-18. Therefore, the Committee recommend that the allocation for the NCC (Revenue Works) should be increased to Rs. 19.09 crore as projected by the NCC to fulfill its requirements and to ensure proper functioning of the NCC.

25. The Committee also note that for the financial year 2017-18 under Revenue (Non-Salary) Head, against the BE projection of Rs. 420.76 crore for NCC, the allocation for the year 2017-18 is Rs. 227.00 crore. There is a significant shortfall of Rs. 193.76 crore. This will have an adverse impact on training activities, and could lead to default in making allied payments. Therefore, the Committee recommend that this short fall of Rs. 193.76 crore should be met so that proper functioning of the NCC could be ensured.

26. Further, the Committee note that for the financial year 2017-18, against the BE projection of Rs. 68.73 crore for infrastructure and MLs, an allocation of Rs. 12.40 crore has been made under Capital Head. There is a huge shortfall of Rs. 56.33 crore. This may adversely affect on the Capital Work Projects (sanctioned /in

progress) and Contractual Obligations (Microlights). The infrastructure projects require deposit of funds. The execution of infrastructure projects will be stalled. The Committed liability may not be honored and it would lead to breach of sovereign projects. Therefore, the Committee recommends that the projection of NCC of Rs. 68.73 crore be taken care of and the shortfall of Rs. 56.33 crore be met so that the Capital Work Projects which are sanctioned/in progress, contractual obligations made and execution of infrastructure projects could be completed within stipulate time.

27. National Cadet Corps (NCC) was established under the NCC Act, 1948. Today it has presence in 683 districts of the country with authorised cadet strength of 15 lakh. NCC aims at creating a pool of organized, trained and motivated youth with leadership qualities in all walks of life, so that they become useful citizens and serve the Nation with all their might regardless of the career they choose. According to the data furnished by the Ministry, the total number of educational institutions at present covered by NCC is 10,472 Schools and 5546 Colleges. In all, 4244 schools and 2383 colleges are presently waitlisted. The Committee also note that 01 Group Headquarter, 07 Army Units and 07 Naval Units were raised in the third phase. This has raised the number of NCC Headquarters to 97 and NCC Units to 814. The Total strength of NCC cadets has increased to 12,81,298 which includes 3,64,084 girl cadets. The ongoing Expansion Plan is likely to be completed by 2018-19 and would reduce the current waiting list marginally as this expansion is based on priorities laid down by the Government.

28. The Committee are of the view, in the current times, when our Defence Services are confronting the problem of shortage of personnel and staff, inducting more schools and colleges into NCC, an institution aiming at developing character, comradeship, discipline, a secular outlook, the spirit of adventure and ideals of

selfless service amongst young citizens, is crying need of the hour. Therefore, the Committee recommend that the expansion plan of the NCC be extended and adequate budgetary and logistic support from the Ministry be provided. The Committee may be apprised of the steps taken in this regard. They also desire that the State Governments should encourage NCC in their respective States and make necessary resources available.

New Delhi
3 March, 2017
12 Phalguna, 1938 (Saka)

MAJ GEN B C KHANDURI, AVSM (RETD)
Chairperson
Standing Committee on Defence

Annexure "A"

Details of major ongoing projects (Cost above Rs. 100 Cr) with name of project, developing agency/lab, date of sanction, original estimated cost, likely date of completion, revised costand revised date of completion of the project.

Sl. No.	Project Name	Developing Agency/Lab	Date of Sanction	Original Estimated Cost (Rs. In Cr)	Revised Cost (Rs. In Cr)	Original Likely Date of Completion	Revised Date of Completion	Expenditure Till Date (Rs. In Cr)
1	2	3	4	5	6	7	8	9
1	Medium Range Surface-to-Air Missile (MRSAM)	RCI	Feb 2009	10075.68	No revision	Aug 2016	Mar 2017	424.24
2	Light Combat Aircraft (LCA) : Phase-II	ADA	Nov 2001	3301.78	6933.08	Dec 2008	Jun 2017	5479.64
3	Kaveri Engine	GTRE	Mar 1989	382.81	2839.00	Dec 1996	Dec 2009*	2044.04
4	Long Range Surface-to-Air Missile (LRSAM)	DRDL	Dec 2005	2606.02	No revision	May 2012	Dec 2017	526.39
5	Light Combat Aircraft (LCA) : Phase-III	ADA	Nov 2009	2573.17	No revision	Dec 2018	No revision	999.24
6	Airborne Early Warning & Control (AEW&C) System	CABS	Oct 2004	1800.00	2425.00	Apr 2011	Jun 2017	2017.17
7	Naval Light Combat Aircraft (LCA Navy Phase-II)	ADA	Dec 2009	1921.11	No revision	Dec 2018	No revision	426.85
8	Medium Altitude Long Endurance (MALE) Unmanned Aerial Vehicle (UAV) and Development of Aeronautical Test Range (ATR) at Chitradurga	ADE	Feb 2011	1649.74	No revision	Aug 2016	Feb 2017	223.16
1	2	3	4	5	6	7	8	9

9	Air-to-Air Missile System 'Astra`	DRDL	Apr 2004	955.00	No revision	Dec 2013	Dec 2016*	439.45
10	Nirbhay - Development & Flight Trials	ADE	Dec 2010	56.93	102.28	May 2013	Jun 2018	23.28
11	Active Electronically Scanned Array Radar	LRDE	Jan 2012	459.65	No revision	Jul 2016	Jan 2019	39.08
12	Kautilya	RCI	Jul 2012	432.80	487.80	Jul 2017	No revision	123.64
13	Solid Fuel Ducted Rocket Ramjet Technology for Air Launched Tactical Missiles (SFDR)	DRDL	Feb 2013	366.00	No revision	Feb 2018	No revision	116.50
14	Hypersonic Wind Tunnel (HWT)	DRDL	Oct 2010	412.00	No revision	Oct 2015	Oct 2019	76.05
15	EW Systems for Capital Ships, Aircrafts & Helicopter of Indian Navy `Samudrika`	DLRL	Jul 2012	342.29	No revision	Jul 2017	No revision	33.91
16	New Generation Anti Radiation Missile (NGARM)	DRDL	Dec 2012	317.20	No revision	Dec 2017	No revision	30.04
17	Post Development Support of AEW&C System (PDSAS)	CABS	Sep 2013	314.32	No revision	Sep 2018	No revision	45.46
18	AIP System on P-75 Submarines and Development of Deliverable LOX system	NMRL	Jun 2014	270.00	No revision	Jun 2017	No revision	17.57
19	D-Jag System Internal RWJ System for Jaguar DARIN III Upgrade Aircraft	DARE	Aug 2012	268.27	No revision	Jun 2015	Dec 2016*	20.81
20	155 mm/ 52 Caliber Advanced Towed Artillery Gun System (ATAGS)	ARDE	Sep 2012	247.90	No revision	Sep 2015	Mar 2017	25.81

1	2	3	4	5	6	7	8	9
21	40 GHz Upgradation of MMIC Facility	SSPL	Feb 2012	198.72	208.98	Aug 2015	Sep 2017	165.50

22	Advanced Light Weight Torpedo	NSTL	Feb 2008	194.53	No revision	Aug 2013	Dec 2017	73.80
23	Flying Test Bed	LRDE	Sep 2012	173.48	No revision	Sep 2017	No revision	97.21
24	D-29 System (Internal EW system for MiG-29 Upgrade Aircraft)	DARE	Mar 2010	168.85	No revision	Dec 2012	Dec2016*	95.50
25	Submarine Periscope	IRDE	Mar 2014	163.77	No revision	Mar 2019	No revision	00.35
26	DMR-249 Grade Steels, Plates, Bulb Bars and Weld Consumables	DMRL	Dec 2012	159.30	No revision	Dec 2018	No revision	36.51
27	Consultancy for AB3 Steel and Establishment of Indigenous Production	DMRL	Jan 2013	158.75	No revision	Jan 2016	Aug 2017	54.57
28	Augmentation of Environmental Test Facility for warheads and Electronic System	TBRL	Sep 2013	121.17	No revision	Oct 2018	No revision	01.59
29	Advance Light Towed Array Sonar (ALTAS)	NPOL	Apr 2012	114.42	No revision	Apr 2016	Dec 2017	31.90
30	Tech Dev for Engine Fuel Control System	GTRE	Oct 2014	177.72	No revision	April 2021	No revision	00.83

***Under Revision**

Annexure"B"

Technology Transfer to Industry

S. No	ToT Recipient Industry	Technology Transferred
1	2	3
1	M/s Jyothy Lab. Ltd., Ujala House, RK Mandir Road,Kondivita, Andheri (E), MumbaiPh. 022-66892800, Fax: 022-6689 2805, Email: contact@jyothy.com	DEPA Technical, DEPA Cream and DEPA Spray
2	M/s. Thermopads Pvt., Ltd., 28, Nagarjuna Hills, Punjagutta, Hyderabad – 500 082	Heated Shoe Insoles for use with Boot Furline High Altitude
3	M/s Bigtech Pvt. Ltd. ,II Floor, SID Entrepreneurship Centre, IISc Campus, Bangalore – 560 012.	H1N1 Lamp Assay
4	M/s. Superior Fabrics, 21, Shri Ram Road, Civil Lines, Delhi - 54	FR Air Crew Survival Jacket
5	M/s. Superior Fabrics, 21, Shri Ram Road, Civil Lines, Delhi - 54	FR Anti G Suit
6	M/s. Superior Fabrics, 21, Shri Ram Road, Civil Lines, Delhi - 54	FR Gloves
7	M/s. Superior Fabrics, 21, Shri Ram Road, Civil Lines, Delhi - 54	FR Overalls
8	M/s. B.S. SudarshanRao, 48, 2nd Cross, 9th Main, N.T.I. Layout, Vidyaranyapura Bangalore – 560 097	Puff & Serve Chapatis
9	M/s Safire Polymers Ltd, C-49/B, Mahendru Enclave , Delhi - 110033	Retort Pouch Processes Foods & Long Term Preserved Chapati
10	M/s ArnafFutristic Technologies(P) Ltd., H-43, Connaught Cirus, New Delhi - 110001	FR Overalls
11	M/s Jain Irrigation Systems Ltd., Jain Food Park, Jain Valley, PO Box 20 Jalgaon - 425 001	Minimally processed vegetables
12	M/s Asian Herbex Ltd.,#5 Prembagh, 3-4-490/A, Barkatpura, Hyderabad 500-027. Ph. 040-27555184, 27562932, 27563016, Fax: 040-27562634 Email: asianherbex@ asianherbex.biz, www.asianherbex.biz	DEPA Technical
13	M/s Vantage Integrated Security Solutions Pvt Ltd , Delhi	Explosive Detection Kit
14	M/s MGM Associates, New Delhi	HAPO Chamber
15	M/s Jyothy Laboratories Limited	Woolcare
16	M/s Meenakshi Hotels Pvt. Ltd. 113-114, Alagarkoli Road, K Pudur, Madurai - 625 007	Retort Pouch Processd Food

1	2	3
17	M/s Kalpatharu, U-76, Hootagalli Industrial Area, Mysore- 570 018	Holybite& Energy Capsule
18	M/s Hallimane Caterers, 3/144(Old No. 1), Coconut Avenue Road 7th Cross, Malleshwaram, Bangalore- 560003	Short Term Preserved Chapatis
19	M/s Aeronav Industrial Safety Appliances, E-24, Sector VII, Noida-201301, U.P	Upgraded Arctic gloves with Active Heating Element
20	M/s Indotech Group, C-8/8490, VasantKunj, New Delhi- 110070	Flame Retardant Overall
21	M/s Frontier Textiles Pvt. Ltd., 40/3, MadanBiswas Lane, Salkia, P.S Golabari, District, Howrah - 711 106, India	FR Flying Overall
22	M/s Dynalog (I) Ltd., Corporate Plaza, SB Road, Shivajinagar, Pune 411 016	LSP of ROV 'DAKSH' Project No. LSP-09/RDE-408
23	M/s Estelar Foods Pvt. Ltd., A1/172, Safdarjung Enclave, New Delhi- 110029	Stuffed Paranthas
24	M/s.Andhra Polymers Pvt. Ltd,Span Solitaire, 6-3-1090/B/5,Raj Bhavan Road, Hyderabad- 500 082, Email – rubber@applind.com. Phone – 040-23442260, Fax – 040-23402095	Acoustic rubber tiles 20mm
25	M/s ArnafFutristic Technologies(P) Ltd., H-43, Connaught Cirus, New Delhi - 110001	Aircrew Survival Jacket
26	M/s Theta Controls, 1, Electronic Estate, Pune Satara Road, Pune 411 009	LSP of ROV 'DAKSH' Project No. LSP-09/RDE-408
27	M/s Bharat Electronics Ltd, NDA Road, Pashan, Pune 411 021	LSP of ROV 'DAKSH' Project No. LSP-09/RDE-408
28	M/s ThermopadsPvt Ltd, No. 28, Nagarjuna Hills, Punjagutta, Hyderabad - 500082	Electrically heated Gloves with active heating elements
29	M/s Sovereign PharmaPvt Ltd, Sarosh Bhawan, 16-B/1, DrAmbedkar Road, Pune-411001	Pralidoxime Chloride and Atropine Sulphate Injections in Cartridges
30	M/s Nikhil Nanoceuticals Pvt. Ltd., Plot 12-B, Jai Hind Society, Madhapur Hyderabad- 500 081	(a)Seabuckthorn Spices Squash (b) Seabuckthorn Herbal Tea (c) Seabuckthorn Biscuits
31	M/s ArnafFutristic Technologies(P) Ltd., H-43, Connaught Circus, New Delhi – 110001	Flame Retardant Automatic Inflatable Life Jacket
32	M/s Feroz Khan, #14, MIG II, KHB Colony, Kalyangiri Nagar, Mysore- 570019	Low Calorie Aloe Vera Beverage

1	2	3
33	M/s Shakti Bhog Snacks Ltd., B-117, Sector- 64, Noida- 201 307	Retort Pouch Processed Technology and shelf stable (No Preservative) Chapaties
34	M/s Aeronav Industrial Safety Appliances, E-24, Sector VII, Noida-201301, U.P	Thermal Drawers
35	M/s Aeronav Industrial Safety Appliances, E-24, Sector VII, Noida-201301, U.P	Thermal Vest
36	M/s Aeronav Industrial Safety Appliances, E-24, Sector VII, Noida-201301, U.P	Upgraded Nato Suit
37	M/s Next Millenium, E-153, Greater Kailash, Part – II, New Delhi-110048	Upgraded Nato Suit
38	M/s Shrinathji Chemicals, E-4/50, Arera Colony, Bhopal-462016	DS-2
39	M/s System Engineering, Sy.No 107/2, KumbalagoduIndl. Area, KengeriHobali, Bengaluru South(Tq), Bengaluru- 560 074	Online conditioner & continuous blancher for vegetables
40	M/s SnehabharatiVivudhodhdheshaSahakaraSamgha Ltd. Kyalanuru, KolarTaluk, Kolar District, Karnataka	(a) Sweetened Millet Mix (b) Spice Millet Mix (c) Millet Sweet cookies (d) Millet Beverage Mix (e) Ash Gourd Juice
41	M/s Gujarat Fluorochemicals Ltd., Noida	Heptafluoropropane (HFC 227ea)
42	M/s. Raksha Polycoats,S-17, 'T' Block, M.I.D.C Bhosari, Pune-411026	Hydro Suit
43	M/s Kalpatharu, U-76, Hootagalli Industrial Area, Mysore- 570 018, Karnataka	Beetle Leaf Juice
44	M/s. Shakti Enteprise 125, Industrial Area, Sction-6, Faridabad-121 006	Hawk Mask
45	M/s. Shakti Enteprise 125, Industrial Area, Sction-6, Faridabad-121 006	Light Weight Integrated HAWK Helmet
46	M/s. NavdeepPvt Ltd,1151, Sector-15 Faridabad-121 007	Light Weight Integrated HAWK Helmet
47	M/s HES Water Engineers(India) Pvt. Ltd., K27, Five Star Industrial Zone, MIDC, butibori, Nagpur- 441122 07104-265 370, 07104-265 372, hesweindia@yahoo.co.in, www.hesweindia.com	Iron Remvoval Unit
48	M/s PD Scientific Industries Pvt Ltd,C-46, Road No.12, Site V, UdyogKunj, Panki, Kanpur-22, 0512-2547 142, 0512-2546 803, pdsikanpur@rediffmail.com, pdsikanpur@gmail.com	Iron Remvoval Unit

49	M/s Hill Tribes Mushroom and Poultry Pvt. Ltd., S.P. Colony, Hapoli, Ziro-791120 (Arunachal Pradesh) 03788-225579, 03788-225353, 9436042003, htmppl@gmail.com	Mushroom Pickle Technology
1	**2**	**3**
50	M/s CalcoPolychem Pvt. Ltd, Delhi	Masterbatch of Photo Degradable Plastics - LDPE and LLDPE
51	M/s. Hindustan Metal Industries, Shri Radhesh, Bhawan, Opposite Shujabad Bhawan, Nai, Sarak, Gwalior - 474 001 Tel. No. 0751 - 262 7140, Fax No. 0751 - 232 7492, Mob No. 94253 – 09591	Autoinjector
52	M/s Shrinathji Chemicals, E-4/50, Arera Colony, Bhopal-462016	Autoinjector
53	M/s IsconSurgicals Ltd., B-70, MIA, Phase-II, Basni,Jodhpur –342 005	Autoinjector
54	M/s SRP Adhesives(Pvt) Ltd., Plot No 7, Akrampur, Industrial Estate, Unnao(U.P)	Fluid Engine Starting Aid
55	M/s Orion Health Foods Pvt. Ltd., G. S Road, Shillong - 793 001	Instant khichdi Mix
56	M/s Ensigns Healh Care Pvt. Ltd., No. 3, Prachi Residency, Baner, Pune- 411 045	Egg Biscuits
57	M/s QUALPRO Diagnostics (Tulip Group),C2 Gitanjali, Dr. AA RegoBagh, Alto Santacruz, Bambolim Complex, PO Goa – 403 202.	ChikungunyaIgm Elisa Detection Kit
58	M/s QUALPRO Diagnostics (Tulip Group),C2 Gitanjali, Dr. AA RegoBagh, Alto Santacruz, Bambolim Complex, PO Goa – 403 202.	Chikungunya Antigen Elisa Detection Kit
59	M/s QUALPRO Diagnostics (Tulip Group),C2 Gitanjali, Dr. AA RegoBagh, Alto Santacruz, Bambolim Complex, PO Goa – 403 202.	JE Elisa Detection Kit for detection of Japenese Encephalitis Infection
60	M/s Hi-Tech Carbon & Catalyst, Plot-J 405/4 Road No. 4 GIDC, Panoli (Guj.) - 394 116.), Mobile No. : 09824111937	Polladium Impregnated Carbon
61	M/s Active Char Products P. Ltd., B-No. 615, Industrial Development Area, Binanipuram, Edyar, Ernakulam - 683 502. (Kerala) Tel. No.: 0484 – 2556514/18, 6586362, Fax No.: 0484 – 2556516	Polladium Impregnated Carbon
62	M/s Pushpa Enterprises, A-5/24 PashcimVihar New Delhi – 110 063. Mobile: 09811012792, 9873712792, Phone: 011-25286550	Stationary Biodigester
63	M/s Samudra Shipyard (P) Ltd., PB No. 10 Chemical Industrial Estate, Aroor –688 534 . (Kerala), Phone: 478 2874027, 2873 927, Fax:478 2872 942	Stationary Biodigester
64	M/s Nucleonix, Hyderabad, Plot No. 162 A & B, Phase -II,I.D.A, Cherlaplly , Hyderabad - 500 051	ACU

65	M/s Intel Design Systems(India) Pvt. Ltd, 47, Industrial Estate ,Lonavala, Pune-410 401	BCU
66	M/s Intel Design Systems(India) Pvt. Ltd, 47, Industrial Estate ,Lonavala, Pune-410 401	Cable Harness of Modernized NBC Protection Syatem of BMP

1	2	3
67	M/s BEL, Pune	Integration of modernized NBC Protection System of BMP - 2/2K
68	M/s Nucleonix, Plot No. 162 A & B, Phase -II,I.D.A, Cherlaplly , Hyderabad - 500 051	RADMAC
69	M/s Premier Explosives limited(PEL), Secunderabad	1200CC, 2400CC and 6000CC pellet Type gas generator
70	M/s Premier Explosives limited(PEL), Secunderabad	SQUIB(Cartridge Electrical) for IFDSS
71	M/s Raas Life Sciences Pvt Ltd , Plot No. 13, Raghavendra Nagar Nacharam, Hyderabad - 76 AP. CP: Dr.M.Shesheer Kumar , MD Phone :040 27150579, info@raslifesciences.com	Swine Flu (H1N1) Detection Kit
72	M/s Crowe & Company, Summerville, South Carolina, USA	Explosive Detection Kit
73	M/s Yorco Sales Pvt. Ltd, New Delhi	Multi-Purpose Foldable Army Field Cot(MPAFC)
74	M/s Active Char Products P. Ltd., B-No. 615, Industrial Development Area, Binanipuram, Edyar, Ernakulam - 02 (Kerala) Phone :0484 – 2556514/18, 6586362Fax : 0484 – 2556516	Impregnated carbon(Whetlerite)
75	M/s Airflow Equipments (India) P. Ltd., 9 ChellaiammanKoil Street Chennai-600117 Fax: 044- 22474784	Railway Biodigester
76	M/s Anjana Steel Industries Pvt., Ltd., Dhirganga More, NH-2 Delhi Road, Baidyabati, Distt.-Hoogly (WB) Phone: 0 33 2226 4688/89/90 : 033 2632 4103 Fax: 033 4006 2785	Railway Biodigester
77	M/s E-Pack Polymers, 2584 Rohatgi Mansion, 2nd Floor, Hamilton Road, Delhi,110 006 Ph: 011 23916882 , Fax 011 23953687	Stationary Biodigester
78	M/s Shri Ram Raja Wood Packers, 905-906, Silver, Estate, University Road, Gwalior- 11	Stationary Biodigester
79	M/s Go Green Solution Pvt., Ltd., 1, Samarth Nagar (w), Ajni Sq., Wardha Road, Nagpur – 15. Tel. No: 0712 – 2250021, Fax No.: 0712 – 2252597 E-Mail: info@gogreensol.com, Web site: www.gogreensol.com	Stationary Biodigetser
80	M/s Alfa System & Services, E-19-C, Sector 8,Noida- 201301 Phone: 0120 4574871-74/Fax: 0120 4574873, alfa.systems@rediffmail.com	Stationary Biodigetser
81	M/s Anjana Steel Industries Pvt., Ltd.,	Stationary Biodigetser

	Dhirganga More, NH-2 Delhi Road, Baidyabati, Distt.-Hoogly (WB) Phone: 0 33 2226 4688/89/90 : 033 2632 4103 Fax: 033 4006 2785	
1	**2**	**3**
82	M/s Idea Forge Techology P Ltd., Off. # 4, 4th floor KReSIT BL, IIT Bombay, Powai, Bombay 400 076	UAV 'NETRA' Project No.TD-2010/R&DE (E)/LIC-02
83	M/s Sarazen Research & Development Organisation Near Transport Nagar, Shankarpur, Gwalior(MP)	CC-2 Suspension
84	M/s Sarazen Research & Development Organisation Near Transport Nagar, Shankarpur, Gwalior(MP)	CC-2 Suspension
85	M/s Ideaforge Technology Pvt. Ltd, Office No 4, 4th Floor, IIT Bombay,Powai, Mumbai	Ground Control Station for Unmanned Aerial Vehicle
86	M/s Amit Biotech (P) Ltd., Unit No.21 Ballygunj, Circular Road, 3rd Floor , Kolkata 700019, phone : 033 2486 6454, fax: 2486 4118	Long Lasting Insectional Mosquito Net(LLIN)
87	M/s Hi-Tech Carbon & Catalyst, Plot J-405/4, Road No. 4, GIDC, Panoli(Guj)- 394 116	Polladium Impregnated Carbon
88	M/s MaanEnviro Technologies, Plot No.38-39 MangalmurtiNaulakha Square, Nemawar Road, Indore Fax: 0731-2405888	Stationary Biodigester
89	M/s Rail Tech, 5625, Qutab Road, New Delhi -55, Ph: 011-23610733/23524833	Stationary Biodigester
90	M/s Larsen & Toubro Ltd, Mumbai, L & T House, N. M Marg, Ballard Estate, Mumbai-01	Integrated Life Support System
91	M/s Active Char Products P. Ltd., B-No. 615, Industrial Development Area, Binanipuram, Edyar,Ernakulam - 683 502. (Kerala), Tel. No.: 0484 – 2556514/18, 6586362 Fax No.: 0484 – 2556516	Impregnated Carbon for Air Cleaning Filters for Object
92	M/s GaneshaImpex , 165, Sector-4, IMT Manesar , (Haryana) Ph. 0124-4811900, 4393900 Fax: 0124-4811999 Email: operation.impex@rediffmail.com	Woolcare
93	M/s Gulf oil Corporation Limited, Hyderabad	DAG Primer for MILAN 2T Missile
94	M/s. Hindustan Metal Industries, Shri Radhesh Bhawan, Opposite, Shujabad Bhawan, Nai, Sarak, Gwalior - 474 001, Tel. No. 0751 - 262 7140, Fax No. 0751 - 232 7492, Mob No. 94253 - 09591	First Aid Kit CBW
95	M/s GaneshaImpex , 165, Sector-4, IMT Manesar , (Haryana) Ph. 0124-4811900, 4393900 Fax: 0124-4811999	Long Lasting Insectional Mosquito Net(LLIN)

	Email: operation.impex@rediffmail.com	
96	M/s Hindustan Metal Industries Shri Radhesh Bhawan, Opposite Shujabad Bhawan, NaiSarak, Gwalior - 474 001. Tel. No. 0751 - 262 7140, Fax No. 0751 - 232 7492 Mob No. 9425309591	Personal Decontamination Kit (PDK) & Three Colour Detector Paper (TCD)
1	**2**	**3**
97	M/s SB Equipments, 309, Durga Chambers, 1333 D.B. Gupta Road, Karol Bagh, New Delhi – 110005, 011-2875 4365(P), 011-2248 5572(F) sbequipment@rediffmail.com	Aeroheal
98	M/s SB Equipments, 309, Durga Chambers, 1333 D.B. Gupta Road, Karol Bagh, New Delhi – 110005, 011-2875 4365(P), 011-2248 5572(F) sbequipment@rediffmail.com	Aeromos
99	M/s SB Equipments, 309, Durga Chambers, 1333 D.B. Gupta Road, Karol Bagh, New Delhi – 110005, 011-2875 4365(P), 011-2248 5572(F) sbequipment@rediffmail.com	PainOut
100	M/s SB Equipments, 309, Durga Chambers, 1333 D.B. Gupta Road, Karol Bagh, New Delhi – 110005, 011-2875 4365(P), 011-2248 5572(F), sbequipment@rediffmail.com	Termiclear
101	M/s Biotron Healthcare(India) P. Ltd, Mumbai	Chikungunya - RT Lamp for Detection of Chikungunya Fever
102	M/s Joy Products, 5, Vandana, BapubhaiVashi Road, Vile Parle(W), Mumbai - 400 056	Short Term Preserved Chapatis
103	M/s Percos India Pvt. Ltd, New Delhi	High Altitude Herbal UV Screen Product
104	M/s ArnafFutristic Technologies(P) Ltd., H-43, Connaught Cirus, New Delhi - 110001	FR Gloves
105	M/s. Arnaf Futuristic Technologies (P) Ltd., H-43, Connaught Place New Delhi – 110 001	FR Anti G Suit
106	M/s Banka Enterprises A-111, Express Apartment,Lakdi-Ka-Pool, Hyderabad – 500 004. Fax. : 040-6668 8028	Bio-Digester
107	M/s Dilip Enterprise, Missa, Nagaon Pin-782138, 9435165155(M), 03672-242 815 (P)	Biotank
108	M/s Singh's Steelwork, Post Box.30, Mission Chariali, Tezpur-784 001 03712-255 622(P), 03712-255 702(F), singhsteels@rediffmail.com	Biotank
109	M/s National Associates, 67, Gauhati University Campus, Sundarbari, Jalukbari, Guwahati-	Biotank

	781014, 0361-2570 178(P)	
110	M/s Inus, 215, MB Road, Birati, Kolkata-700051 011-2539 1514(P), 011-2844 1333(F), inuswater@gmail.com	Biotank
111	M/s Industrial Services, 93, Dakshindari Road, Kolkata-700048 033-2521 4561(P), 033-2521 4294(F), inserv@vsnl.net, www.industrialservices.co.in	Biotank

1	2	3
112	M/s Buhania Bros.D-56, Sitapuri Part-I, Gali No.18, Near Pankha Road, New Delhi -110 045, 011-2550 8104(P), 011-2561 2934(F), buhania@hotmail.com	Biotank
113	M/s Adigear International, A-40, Mayapuri Industrial Area, New Delhi -110064	FR Overall
114	M/s BASICS Ltd. Delhi	Instant Cooking Pulses and dal flakes
115	M/s BASICS Ltd. Delhi	Instant whole pulses and their curries
116	M/s BASICS Ltd. Delhi	Short term preserved chapaties
117	M/s Besco Limited (Foundry Division), 7th Floor, Poonam, 5/2 Russel Street, Kolkata – 700 071 Ph. 033-22276784, 22263964 Fax: 033-22261406	Biodigester
118	M/s Larsen & Toubro Limited, Mumbai, L & T house, N. M Marg, Ballard Estate Mumbai-400001	Lakshya-2 APTA(Advanced Pilotless Target Aircraft)
119	M/s Vidil Food Products, Mysore	Flax Based Spice Powder
120	M/s V K S Verve Nectors Pvt. Ltd, Kerala	Holibite
121	M/s Vidil Food Products, Mysore	Millet Based Jamun Mix Powder
122	M/s Bush Foods Overseas Pvt. Ltd, Delhi	Ready pouch processed foods
123	M/s Bush Foods Overseas Pvt. Ltd, Delhi	Ready processed Chapaties
124	M/s Hunlang Foods(P) Ltd, Meghalaya	Short Term Preserved Chapaties
125	M/s Inkal ventures Pvt. Ltd, Kerala	Ready Pouch Processed foods
126	M/s Larsen & Toubro Limited, Mumbai L & T House, N. M Marg, Ballard Estate, Mumbai 400001	Helicopter Oxygen System
127	M/s. S.S.Rubbers Pvt. Ltd., 5-9-287, R.G. Nagar, I.E.Kukatpally, Balanagar, Hyderabad – 500037, Ph: 040 -23720394/5/6, Fax: 040-23720183, E-mail :mktg@ssrubbers.com, Wbsite :www.ssrubber.com	20 mm Rubber Tiles
128	M/s. Murugan Enterprises H 30/32, Ashtalakshmi Garden, Basant Nagar Chennai – 600 090 Phone :044- 2491 5986, 2491 7637, 2490 3456, Fax : 044 – 2490 0345, mayurme@vsnl.com Factory : Village No.7, KaranaiPuduchery Village, ChengalpetTaluk Kanchipuram District – 603 202, 044-27468723, 27468754	20mm Rubber Tiles
129	M/s Reliable Multifood Company, Mumbai G/10 ParelSivsmurthi CHS Manjrekar Lane Dr. E Moses Road, Worli Mumbai – 400018	Instant RavaIdli Mix

	Maharashtra India	

1	2	3
130	M/s Reliable Multifood Company, Mumbai G/10 ParelSivsmurthi CHS Manjrekar Lane Dr. E Moses Road, Worli Mumbai – 400018	Instant Upma Mix
131	M/s Dabur	Alocal Cream
132	M/s Shree Cosmetics	Alocal Cream
133	M/s MastrosMedilines Systems Limited, Mumbai	Poratable Handheld Physiological vital Parameter Monitor(PPVPM)
134	M/s RakshaPolycoatsPvt Ltd, Pune	Seaking Float
135	M/s Arkin Creations Pvt. Ltd. H-127, Ist Floor, Residency Greens, Greenwood City, South City-1, Gurgaon-122001 Ph. 09650682111, Mob. 09818432020,Email. arkincreations@gmail.com, www.arkin.org.in	Bio-Digester
136	M/s Premier Explosives Ltd, Hyderabad	Manufacturing of Fuel Rich Sustainer Grains for Akash Missile
137	M/s Flower Valley Food, Delhi	Retort Processed Chapaties
138	M/s Sab Foods, Chennai	Appetizer beverage mix-spiced drink mix
139	M/s Sab Foods, Chennai	Chicken Biscuits
140	M/s. Poona Mesuring Tools, 60 East Khadkee, Line Bazar, Near Holkar Bridge, Pune Mob : 8149443069, Fax : 020 – 26505219, poonameasuring@gmail.com	Manufacturing Process for Peizocomposite Transducer Elements
141	M/s. Allied Industries, Martand, Gandhi Chowk, Kalyan – 421301 Factory : F-36, M.I.D.C., Ambad, Nasik-422010 Tel : 0091-251-2207206, Fax : 0091-251-2203468, 0251 – 221 2976 0091-253-6607752, Fax : 0091-253-6607751, allied_nashik@yahoo.com	Manufacturing Process for Peizocomposite Transducer Elements
142	M/s Shubhra Biotech Private Limited, Plot No. 158 F, Phase II IDA Cheriyapally, Hyderabad-500051Earlier, M/s Real India LifetechPvt ltd, Vasantha Chambers, Pent House, 5-10-173, FtehMaidan Road, Basheerbagh, Hyderabad	Biodigester
143	M/s Vibhu Composite Works, Yamuna Nagar	Biodigester
144	M/s S V K Green Tech Pvt. Ltd. B-121, Sec-71, Noida-201303, U.P	Biodigester
145	M/s Eram Scientific Solutions Pvt. Ltd	Biodigester

	TC 9/1615, SRHM Road, Sasthamangalam, Trivandrum-695010	

1	2	3
146	M/s Srikar Organics India Ltd. Plot No- 24, Near Chandamama Hospital, Raghavendra Nagar, Nacharam, Hyderabad - 39	Biodigester
147	M/s BSA Corporation Ltd, Pune Gat No. 2329, A/1, S.no 279, 281, 287, Wagholi, Pune, India - 412207	Biodigester
148	M/s Century Pharmaceuticals Ltd, Vadodara 406, World Trade Center, Sayagjiganj, Vadodara - 390005	Biodigester
149	M/s Pioneer Polymers Pvt. Ltd, Delhi	Herbal Mosquito Repellant Vaporizer
150	M/s I-Chem (India), Delhi	Roachtox&Roachline
151	M/s SujayEnvirotech India Private Ltd, C-480, Sumati Apartment, Near ShaniwarwadaPeth, Pune-30	Biodigester
152	M/s HYT Innovative Projects Pvt. Ltd., Pune 15, Vishrambaug Housing Society, SenapatiBapat Road, Pune - 411 016	Manufacturing of HEMRIN-EPDM based rocket motor insulation
153	M/s Waterlife India Private Limited, Plot No 9, SaiNidhi, 2nd Floor, Krishnapuri Colony, West Marredpally, Secunerabad	Mobile RO Water Purification System
154	M/s Mars Equipments Limited, India 28-A, Vidhan Sabha marg, Burlington Xing, lucknow 226001(U.P), India	Biodigester
155	M/s Premier Explosives Ltd, Secunderabad Premier House, 11, Ishaq Colony Near AOC Centre Secunderabad 500015 AP(India)	Manufacturing of BKNO3 pellets of ME-445 Compostion
156	Khandelwal Enterprises, Jaipur	Biodigester
157	Shree MathaNutrifoods, Hubli, No. 65, Niketan Garden, Behind NWKSRTC, Gokul Road, Hubli - 580030	Millet - Ragi based products
158	M/s Waterlife India Private Limited, Secunerabad	Biodigester
159	Ultra Dimensions Pvt Ltd, Vishakhapatnam	Biodigester
160	M/s MAK India Ltd 7/41-B, Avinashi Road, Coimbatore-641014 Ms A Siva Ananthi&Mr S Manoharan MAK India Ltd Biodigester project Coordinator & Team Mobile No. 91-9994372047 Emai Id : bioprojects@makcontrols.com Phone: 0422-4305000 Fax No : 0422-4305060	Biodigester

161	M/s Alfa Therm Limited - 6, Community Centre, Mayapuri, Phase-I, New Delhi – 110 064. Tel. No: 011-28115222, 28116222/Fax No.: 011-28115396	Plain Bio-Digester
1	**2**	**3**
162	M/s Bhilai Engineering Corporation Ltd, Hathkoj Village, Industrial Area, Bhilai-490026	Biodigester
163	Frontier Sales Corporation Bamunimaidan Industrial Estate, 1st Bye-Lane, Opp. BhogaliJalpan, Guwahati-781004	Biodigester
164	CRPF Ministry of Home Affairs, Government of India, CGO Complex, Block No 1, Lodhi Road, New Delhi - 110003	Baffle Ranges - A smart solution for small arms firing
165	Grandeur Business Solutions Pvt. Ltd. D-228, Sarvodaya Enclave, Near IIT Opposite Mother's International School, New Delhi - 17	Biodigester
166	Chacra Foods, Madurai, No 18 Vallabhbhai Road, Chinn Chokkikulam, Madurai (T.N) –20	Puff & Serve Chapatis
167	Electron Technologies, Paokkad, 25/ 853 (II), Laksmi Arcade, Mosque Road, Palakkad (Kerala) – 678014	Minimally processed vegetables in precut and packaged form
168	Wahisons Private Limited, D 5 Pushpanjali Farms, Bijwoson, New Delhi – 110061	Biodigester
169	G C Home Mades, #766, Near Nirmithi Kendra, Bogdi, 2nd Stage, North, Mysore- 570026	Short Term Preserved Chapaties
170	Live Long Foods Pvt. Ltd House No- 1-8-506/43-A, Prakasham Nagar Behind Hanuman Mandir, Begumpet, Hyderabad	Retort Pouch Processed Food
171	M/s Vinni Chemicals Pvt Ltd, Delhi 49, Rajpur Road Delhi-11054	Glycol based Antifreeze Coolants - DAFC 30 and DAFC 50
172	M/s KerawellNutrifoods, Kanad, Edayannur (P.O.) Kannur District, Kerala - 670595	Instant Coconut Chutney Mix
173	M/s Hi-Tech Robotic Systemz, Ltd, Plot No A-18, Infocity-I, Sector- 33& 34 Gurgaon 122001	ROV 'DAKSH'
174	M/s Western India Cashew Company Pvt Ltd, Opposite Collector's Bungalow, Kochupilamoodu, Kollam-691001, Kerala	Ergogenic Bar, Flaxoat Tasty Bar & Omega-3-Rich Bar
175	M/s PravekKalpPvt Ltd, B-8, Sector-3 NOIDA , UP -201301	SEABUCKTHORN HERBAL TEA
176	M/s PravekKalpPvt Ltd, B-8, Sector-3 NOIDA , UP -201301	HERBAL ADAPTOGENIC APPETIZER
177	M/s PravekKalpPvt Ltd, B-8, Sector-3 NOIDA , UP -201301	SEABUCKTHORN BEVERAGE
178	M/s PravekKalpPvt Ltd, B-8, Sector-3 NOIDA , UP -201301	SEABUCKTHORN SOFT GEL CAPSULE
179	M/s NCR Akshaya International, 5 Rame Grounder Colony, Near CTC Depot, Kovai Road, Pollachi -642002 Tamil Nadu	RETORT POUCH PROCESSED FOODS

180	M/s Shaan Foods, #10/A, 1st Floor, CV Road Cross, Bannimantap, Mysore -57015	Short Term Preserved Chapatis
181	M/s Maestros Electronics and Telecommunications Limited EL-66, TTC Industrial Area, Electronic Zone, MIDC, Mahape, navi Mumbai, Maharashtra	Rugged Portable Telemedicine System for Armed Forces
1	**2**	**3**
182	M/s AmbePhytoextractsPvt Ltd, U-190, Street No.4 Shakarpur, New Delhi-11092	Seapricot Beverage
183	M/s AmbePhytoextractsPvt Ltd, U-190, Street No.4 Shakarpur, New Delhi-11092	Seabuckthorn Jam
184	M/s AmbePhytoextractsPvt Ltd, U-190, Street No.4 Shakarpur, New Delhi-11092	Seabuckthorn Beverage
185	M/s AmbePhytoextractsPvt Ltd, U-190, Street No.4 Shakarpur, New Delhi-11092	Seabuckthorn Soft Gel Capsule
186	M/s AmbePhytoextractsPvt Ltd, U-190, Street No.4 Shakarpur, New Delhi-11092	Seabuckthorn Herbal Tea
187	Caparo Engineering Limited, 101-104, 1st Floor, Naurang House,21,Kasturba Gandhi Marg, New Delhi-110001	Bio-Digester
188	Madaan Bio Green Pvt Ltd, 301 Ratan Colony, JiwajiGanj, Saya Apartment, Gwalior (M.P.) 474001	Bio-Digester
189	INVA Power Systems Pvt Ltd, G-582, RIICO Industrial Area, Sitapura, Jaipur-302022	Bio-Digester
190	M/s NF Forgings Pvt Ltd, Sankrail Industrial Park, NH-6 (BombayRoad), DhulagarhSankrail, Howrah -711302	Bio-Digester
191	Prestar Infrastructure Projects Ltd, 11 DrRajendra Prasad Sarani Kolkata -700001	Bio-Digester
192	AJ Tech EquipmentsPvt Ltd, 53/13 Hazra Road, Ballygunge Chambers, 3rd Floor, Kolkata-700019	Bio-Digester
193	Innovative & Innovators (P) Ltd No 7, Car Street, triplicane, Chennai, Tamil Nadu	Herbal Room Freshner cum Mosquito Repellent
194	M/s Bawa Industries, Agra	Boot Flying
195	M/s Economic Explosives Ltd, Nagpur	Akash Booster Propellant Grains
196	M/s Economic Explosives Ltd, Nagpur	ToT of Propellant Grains (Cartridge loaded), Igniter, MAT-O-Bond for Pinaka MK-I and Energetic Propellant Casting in case bonded rocket motors (Propellant) & Igniter

		for PInaka MK-II
197	M/s MaaTariniPestochem& Biotech, Balasore	Roachtox&Roachline
198	M/s Hindustan Petroleum Corporation Limited, Scope Minar, Laxmi Nagar, Delhi-110092	Glycol based Antifreeze Coolants - DAFC 30 and DAFC 50
199	M/s Micaply, 23-24, New Sector Phase-II, Industrial Area, Mandideep Bhopal	TDI Helmet for ALH
1	**2**	**3**
200	M/s TAN Enterprises, 397, Grd Floor, Masjid Moth, South Extn Part 2, New Delhi-110049	Leg Garter Restraint
201	M/s Bawa Industries, Agra	Boot Furline
202	M/s Premier Explosives Ltd, Secunderabad Premier House, 11, Ishaq Colony Near AOC Centre Secunderabad 500015 AP(India)	Energetic propellant casting in case bonded rocket motors (Pinaka Mk-II propellant) & Igniter for Pinaka MK-II
203	AOV International B-5, Sector-59 NOIDA 201301	Biodigester
204	Victora Auto Pvt Ltd, Sh 44th Mile Stone Delhi Agra Road, Village Sikri, Faridabad-121004	Biodigester
205	Pristine Metal Form Pvt Ltd,B1/1, MIDC Phase II, Manpada Road, Sagaon, Dombivali (East), District Thane, Maharashtra, 421204	Biodigeter
206	Bharat BioconPvt Ltd, Opp PHE Office DurgaChowk, North Chakradhar Nagar, Raigarh, Chhattisgarh-496001	Biodigeter
207	Mahajan Polymer Industries Shop No G 34, Udhan Complex , Mastagad , Jalna Maharashta-431203	Biodigeter
208	KK Nag Ltd, 15 Sangam Project, Phase II, 46 DrAmbedkar Road, Pune 411001	Biodigeter
209	White Hope ImpexPvt Ltd, J /59, Ashok Vihar, Phase -1, New Delhi-110052	Biodigeter
210	M/s AkshayJyoti Energies Pvt Ltd, 608, 6th Floor, maruti Plaza, Sanjay Place, Agra - 02	Biodigeter
211	Elefo Biotech Private Limited, T-1/103, Park View Residency Sector-3.Vihar, Gurgaon-01	Biodigeter
212	Panchatatva Waste & energy Technology Solutions, New Delhi	Biodigester
213	Cosmic Water Health Energy Environment Enterprises Pvt Ltd, Pune	Biodigester
214	ShrinathjiKayakalp Remedies Pvt Ltd, Raisen M.P.	Biodigester
215	M/s Pearl Corporation, 9/12, 'Chirag' House, Plot No. 44/7, Sector 18, Vashi-Navi Mumbai,	Milk Testing Kit

	Maharashtra-400705	
216	M/s Pearl Corporation, 9/12, 'Chirag' House, Plot No. 44/7, Sector 18, Vashi-Navi Mumbai, Maharashtra-400705	Beetroot Juice Powder Mix
217	M/s Pearl Corporation, 9/12, 'Chirag' House, Plot No. 44/7, Sector 18, Vashi-Navi Mumbai, Maharashtra-400705	Instant IdliSambar Mix

1	2	3
218	M/s Pearl Corporation, 9/12, 'Chirag' House, Plot No. 44/7, Sector 18, Vashi-Navi Mumbai, Maharashtra-400705	Retort Pouch Processed Foods
219	M/s Aqua KareInc, Kamala Bhavan, 15/337, Varada Nagar, Gudur-524101, Nellore Dist, AP	Retort Pouch Processed Foods
220	M/s Core Carbons Pvt Ltd S.F. 655, V. Kallipalayam (P.O.), PalladamDharapuram Main Road, Palladam (T.K.), Tirupur (DT.) -641664	Impregnated carbon for Air Cleaning Filters
221	M/s Core Carbons Pvt Ltd S.F. 655, V. Kallipalayam (P.O.), PalladamDharapuram Main Road, Palladam (T.K.), Tirupur (DT.) -641664	Palladium Impregnated Carbon for Air Cleaning Filters
222	M/s Core Carbons Pvt Ltd S.F. 655, V. Kallipalayam (P.O.), PalladamDharapuram Main Road, Palladam (T.K.), Tirupur (DT.) -641664	Impregnated Carbon (Whetlerite) for NBC Filter & Canister
223	M/s Ajit Chemicals pvt Limited, 104/430, P Road, Kanpur, UP 208012	Flex Water Bottle with Cover
224	M/s Ganesh FootwearsPvt ltd, C-392, DSIIDC Industrial Area, Narela, Delhi-110040	Flex Water Bottle with Cover
225	M/s SBL Plastics Pvt Ltd, 51 B Rama Road, New Delhi-110015	Flex Water Bottle with Cover
226	M/s Manjushree Technopack limited, 60-E, Bommasandra Industrial Area, Hosur Road, Bengaluru-560099	Flex Water Bottle with Cover
227	M/s Rangarajan Foods, 272, Sandaipt Main Road (upstairs), Shevapet (Near Sriman Theatre, Salem-636002, Tamil Nadu	Instant IdliSambar Mix
228	M/s Nutrimark Foods Pvt Ltd, AtPost-Terkheda, Tal-Washi,Dist-Osmanabad, Pin 413525	Flax Based Spiced Powders
229	M/s Classic Laminations , 1/370 (IA), Chettikadu, Andipalayam (PO), Tiruchengode (Tq), Namakkal-District-637214, Tamil Nadu	Millet Cookies
230	M/s ChokhiDhani Foods, ChokhiDhani Tower, S-8, Shyam Nagar, Main Ajmer Road, Jaipur-302019	Shelf Stable (No Preservative) Chapatis
231	M/s ChokhiDhani Foods, ChokhiDhani Tower, S-8, Shyam Nagar, Main Ajmer Road, Jaipur-302019	Retort Pouch Processed Foods
232	M/s Sneha Food Products, Kyalanur Village & Post , KolarTq, Karnataka	Tamarind Jam
233	M/s Shakti Enterprises No. 125 Sector 6 Faridabad 121006	TD1 Helmet for ALH Helicopter
234	Liberty Shoes Ltd, at Liberty Complex, 17th Mile Stone , G.T. Karnal Road, Gharaunda-14	Boot Flying
235	Liberty Shoes Ltd, at Liberty Complex, 17th Mile Stone , G.T. Karnal Road, Gharaunda-14	Boot Furline
236	M/s RakshaPolycoatsPvt Ltd, S-17, T Block, MIDC, Bhosari, Pune - 411026	Breathing Apparatus

237	M/s Narendra Explosive Ltd, Plot -59, Gandhi Road, Dehradun-248001 (UK)- India	OR Grenades
1	**2**	**3**
238	M/s Trident Pneumatics Pvt Ltd, Plot-5/232, K.N.G. Pudur Road, Somayampalayam P.O. Coimbatore -641100	Air Cleaning Filters
239	M/s Vishwa Traders, Plot No. 74/215, Dhankutti, Kanpur-208001, UP	Portable Decontamination Apparatus
240	M/s Weldynamics, 622 Shiv City (Silver) Rau, Indore Indore	Biodigester
241	M/s Trident Pneumatics Pvt Ltd, Plot 5/232, K.N.G. Pudur Road, Somayampalayam P.O. Coimbatore - 641108	NBC Filter FAS -200M, 400M,850M, FAT-100M & 200M
242	M/s ArnafFutristic Technologies(P) Ltd. H-43, Connaught Cirus, New Delhi - 110001	Leg Garter Restraint
243	M/s Elite Polymer , Nischindha (W), P.O. Ghoshpara (Bally), Howrah 711227	Breathing Apparatus
244	M/s Elite Polymer , Nischindha (W), P.O. Ghoshpara (Bally), Howrah 711227	Hydro Suit (SES)
245	M/s Christy Friedgram Industry, A2 & A3, SIDCO Industrial Estate, Andipalayam, Tiruchengode - 637214	Millet Cookies
246	M/s Pal Enterprises, Naraina New Delhi110028	Flex Water Bottle with Cover
247	M/s SaraplastPvt Ltd, 203, Rujuta Complex, Nichiket Park, Baner Road, Pune -411045	Biodigester
248	M/s Taste'L Fine Food P Ltd, 174, Govinda, Jawahar Nagar, Goregaon W, Mumbai	Retort Pouch Processed Foods
249	M/s Taste'L Fine Food P Ltd, 174, Govinda, Jawahar Nagar, Goregaon W, Mumbai	Shelf Stable (No Preservative) Chapatis
250	M/s Narendra Explosive Ltd, Plot -59, Gandhi Road, Dehradun-248001 (UK)- India	Oleoresin based products
251	MIDHANI, Hyderabad	Near Isothermal Forging for Manufacturing High Pressure Compressor Disc Forgings of Adour Engine
252	IREL	REPM
253	M/s Setco Chemicals (I) Pvt Ltd, Vasai, Thane	NMRL-MASTIC
254	M/s PatanjaliAyurved Ltd	Seabuckthorn Based Technologies
255	TK International, Barnala	Biodigester Technology
256	M/s Aerospace Engineers, Salem	CFF
257	M/s Pioneer Natural Products, D-9, Terminal Market, MuhanaMandi, Sanganer, Jaipur	Aloe Vera Juice

	(Rajasthan)	
258	Larsen & Toubro Limited, Mumbai	P7 Heavy Drop Platform System (HDPS)
1	**2**	**3**
259	M/s Gulf Oil Corporation, Hyderabad	Pyrocartridges PC-050 DQ, PC-100 DQ & PC-110 DQ
260	M/s Rajaganapathy Agro Food, Mysore	Instant IdliSambar Mix
261	M/s Shakti Rubber Products Pvt Ltd, Mysore	Adhesive NMR 51K & NMR 88C
262	M/s Shakti Rubber Products Pvt Ltd, Mysore	Vibro Acoustic Rubber Tile 20 mm
263	M/s TK International, Tapa	LongLasting Insecticidal Net (LLIN)
264	M/s ShrinathjiKayakalp Remedies Pvt Ltd, Mandideep	Water Purification Systems
265	M/s Vajra Rubber Products (P) Ltd, Trissur, Kerala	Adhesive NMR 51K and NMR 88C
266	M/s Vajra Rubber Products (P) Ltd, Trissur, Kerala	Acoustic Rubber Tile 20 MM
267	M/s Vajra Rubber Products (P) Ltd, Trissur, Kerala	Acoustic Rubber Tile 51 MM
268	M/s Premier Explosives Limited, Secunderabad	Pyrocartridge PC -110 DQ
269	Border Security Force (BSF), Ministry of Home Affairs, Government of India	Baffle Ranges: A Smart Soilution for Small Arms Firings
270	M/s Haldiram Snacks P Ltd, Noida	RETORT POUCH PROCESSED FOODS
271	M/s Haldiram Snacks P Ltd, Noida	SHELF STABLE (NO PRESERVATIVE) CHAPATIS
272	Economic Explosives Ltd, Nagpur	Pyrocartridges PC-025 DQ, PC-050 DQ, PC-100 DQ and PC-110 DDQ
273	M/s Marudhar Paints and Polymers, G-800,801 Industrial Area, Phase-IV, Boranada, Jodhpur	Camouflage and Infrared Reflective (CAM-IRR) Paints
274	PahwaMetalTech Private Limited, India	Copper Titanium Alloy
275	M/s Andhra Polymers Pvt Ltd, Hyderabad	Adhesive NMR 51K & NMR 88 C
276	M/S Uurmi Systems Pvt Ltd, Hyderabad	Explosive Identifier (e-DISCERNER
277	M/s New Age Instruments & Materials Pvt Ltd, Gurgaon	Explosive Identifier (e-DISCERNER

278	M/s Systems Controls TechnologySolutionsPvt Ltd, Bengaluru	Explosive Identifier (e-DISCERNER
279	M/s Ananth Technologies Ltd, Hyderabad	Explosive Identifier (e-DISCERNER
280	M/s Shri NathjiKayakalp Remedies Pvt Ltd, Bhopal	Flameless Heater for Retort Pouch
281	M/s Novel Tissues Pvt Ltd, Mysore	Remocon
1	**2**	**3**
282	M/s Flower Valley Food Farms Pvt Ltd, Alwar	Flameless Heater for Retort Pouch
283	M/s Aeronav Industrial Safety Appliances	Boot Flying
284	M/s Aeronav Industrial Safety Appliances	Heated Insoles
285	M/s Aeronav Industrial Safety Appliances	Boot Furline
286	M/s BhargaviGreshma Foods Private Limited, Secunderabad	Instant Whole Pulses & Their Curries
287	M/s Nidhi Food Products, Puttur	Puff & Serve Chapatis
288	M/s Economic Explosives Ltd, Nagpur	Manufacturing of Fuel Rich Sustainer Propellant Grains for AKASH Missile
289	M/s Economic Explosives Ltd, Nagpur	Manufacturing of Igniter for Akash Booster
290	M/s Economic Explosives Ltd, Nagpur	Manufacturing of Propellant & Igniter for 122 mm ERR
291	M/s Economic Explosives Ltd, Nagpur	Manufacturing of Igniter for Akash Sustainer
292	M/s Economic Explosives Ltd, Nagpur	Manufacturing of Propellant for LRSAM P II Grains
293	Premier Explosive Limited, Secunderabad	Manufacturing of Igniter for Akash Booster
294	Premier Explosive Limited, Secunderabad	Manufacturing of Propellant & Igniter for 122 mm ERR
295	Premier Explosive Limited, Secunderabad	Manufacturing of Propellant for LRSAM P II Grains
296	Premier Explosive Limited, Secunderabad	Manufacturing of Igniter for Akash Sustainer
297	Economic Explosives Ltd, Nagpur	Multi Mode hand Grenade

298	MiltexEquipments, New Delhi	Backpack
299	M/s Arboreal Agro Innovations Private Limited	Brahmi Drink

1	2	3
300	M/s Indian FoodTech Ltd, Delhi	Shelf Stable (No Preservative) Chapatis
301	MM Industrial Controls Private Limited, Dharwad	Biodigester
302	M/s Nature Essential Foods Pvt Ltd, Mumbai	Ready to Eat Bars(Flax Oats Bar, High Energy Bar, Barley Bar, Composite cereal Bar, Ergogenic Bar, Omega 3 rich Bar)
303	M/s Bonne Terre Foods Private Limited, Bangalore	Instant IdliSambar Mix
304	M/s Surya Enterprises, Rajahmundry (A.P.)	Puff and Serve Chapaties
305	M/s Brahmins Foods India Pvt Ltd, Kerala	Instant Coconut Chutney Mix
306	M/s Brahmins Foods India Pvt Ltd, Kerala	Instant IdliSambar Mix
307	M/s IRCTC, New Delhi	Retort Pouch Processed Foods
308	M/s Daddy's Food Products, Kerala	Puff & Serve Chapatis
309	M/s Garware-Wall Ropes, Ltd, Pune	CBRN Foldable Stretcher, Multipurpose Army Field Cot cum Stretcher (MPAFCS) & Light Weight Foldable (LWF) Stretcher
310	M/s Frontier ProtectivewearPvt Ltd, Kolkata	Protective Clothing for Medical First Responder
311	Arboreal Agro Innovations Pvt Ltd	Performance Enhancement Drink
312	Economic Explosives Ltd, Nagpur	Bund Blasting Device Mk-II
313	Economic Explosives Ltd, Nagpur	Mechatronic Fuze For Grenade
314	Brahmins Foods India Pvt Ltd, Kerala	Instant Upma Mix
315	M/s Shrinathji Chemicals, Mandideep	Alocal Cream
316	Larsen &Tourbo	Resin Film Infusion
317	Bharat Electronics Limited, A Govt. of India Undertaking, Ministry of Defence	Resin Film Infusion
318	Reliance Industries Limited, 3rd Floor, Market Chamber IV, 222, nariman Point, Mumbai - 21	Resin Film Infusion

1	2	3
319	M/s Advance Paints Pvt Ltd, Mumbai	Camouflage and Infrared Reflective (CAM-IRR) Paints
320	M/s Shree Cosmetics Limited, Baddi	High SPF Sun Cream for High Altitude
321	M/s Thermax Ltd, Pune	NMRL-Modular Phosphoric Acid Fuel Cell (NMOPAFC)
322	M/s Jain Agro Foods Pvt Ltd, Mandya	Vegetable Juice (Beetroot)
323	M/s Sure Safety (India) Pvt Ltd, Vadodara Gujarat	PCM Cool Vest and Cap
324	M/s SS Rubbers Pvt Ltd, Hyderabad	Five Rubber Compunds

STANDING COMMITTEE ON DEFENCE (2016-17)

MINUTES OF THE SEVENTH SITTING OF THE STANDING COMMITTEE ON DEFENCE (2016-17)

The Committee sat on Wednesday, the 22 February, 2017 from 1100 hrs. to 1740 hrs. in Main Committee Room, Parliament House Annexe, New Delhi.

PRESENT

Maj Gen B C Khanduri, AVSM (Retd) - Chairperson

Lok Sabha

2. Shri Dipak Adhikari (Dev)
3. Shri Suresh C Angadi
4. Shri Thupstan Chhewang
5. Col Sonaram Choudhary(Retd)
6. Shri H D Devegowda
7. Km Shobha Karandlaje
8. Dr Mriganka Mahato
9. Shri Rodmal Nagar
10. Shri A P Jithender Reddy
11. Shri Ch Malla Reddy
12. Shri Rajeev Satav
13. Smt Mala Rajya Lakshmi Shah
14. Shri Partha Pratim Ray
15. Shri Dharambir Singh
16. Smt Pratyusha Rajeshwari Singh

Rajya Sabha

17. Shri Rajeev Chandrasekhar
18. Shri Madhusudan Mistry
19. Shri Sanjay Raut
20. Smt Ambika Soni
21. Dr Subramanian Swamy

SECRETARIAT

1. Smt Kalpana Sharma - Joint Secretary
2. Shri TG Chandrasekhar - Director
3. Smt Jyochnamayi Sinha - Additional Director
4. Shri Rahul Singh - Under Secretary

WITNESSES

REPRESENTATIVES OF THE MINISTRY OF DEFENCE

1. Shri G Mohan Kumar, Defence Secretary
2. Shri A.K Gupta, Secy(DP)
3. Shri Prabhu Dayal Meena, Secy(ESW)
4. Dr. S. Christopher Secy (R&D)
5. Shri Sunil Kumar Kohli, FA (DS)
6. Smt. Smita Nagaraj, DG(Acq)
7. Shri J.R.K. Rao, Addl. Secy.(J)
8. Ms. Surina Rajan, Addl. Secy. (DP)
9. Smt. Anuradha Mitra, FA (Acq)
10. Lt Gen Sarath Chand, VCOAS
11. Vice Admiral Karambir Singh, VCNS
12. Air Mshl SB Deo, VCAS
13. Air Marshal RKS Bhadauria, DCAS
14. Air Mshl HS Arora,DGAO
15. Air Vice Mshl J Chalapati, ACAS(Projects)
16. Air Vice Mshl Pothureddy Subhash Babu, ACAS(Fin Plg)
17. VAdm Ajit Kumar P, DCIDS(PP&FD)
18. Lt. Gen Vinod Vashisht, DG NCC
19. Lt Gen Nimbhorkar, MGO
20. Lt Gen PM Bali, DG PP
21. Lt Gen Subrata Saha, DCOAS
22. Shri J. Janardhan, Spl. DG
23. Shri Sanjay Prasad, JS(LS)
24. Shri Deepak Anurag, JS&AM(LS)
25. Shri Jayant Sinha, JS&AM(MS)
26. Shri Rajeev Verma, JS&AM(Air)
27. Smt Devika Raghuvanshi, JS(Navy)
28. Shri Vijayendra, JS(DOMW)
29. Shri A.N. Das, Addl FA & JS
30. Shri Subir Mallick, Addl FA & JS
31. Shri Ravi Kant, JS(ESW)
32. Shri Ashwini Kumar, Addl. FA(AK)& JS
33. Smt. Dharitri Panda, Addl. FA(DP) & JS
34. Shri R.K. Karna, Addl. FA(RK) & JS
35. Air Mshl HS Arora,DGAO
36. Air Vice Mshl J Chalapati, ACAS(Projects)
37. Air Vice Mshl BR Krishna, ACAS(Plan)
38. Air Vice Mshl Pothureddy Subhash Babu, ACAS(Fin Plg)
39. AVM H J Walia, Addl. Director General/NCC
40. Rear Admiral DK Tripathi, ACNS(P&P)
41. Maj Gen SS Hasabnis-TM (LS)
42. Maj Gen VS Sreenivas, ADG Proc
43. Maj Gen Sanjay Thapa, Offc DGFP
44. Maj Gen Anil Puri, DDG(A)
45. Maj Gen PM Vats, ADG WE

46. Smt. Amrita Sharan, DDG (P&B)
47. IG VD Chafekar, DDG(P&P)
48. Capt. Prakash Gopalam, DNP
49. Brig Sanjay Puri, DDG &PP(Plans)
50. Col Puneet Aggarwal, Dir PP (Lgs)
51. Smt. Maulishree Pande, Dir(Fin/Bud)
52. Shri A.N. Das, Addl FA & JS
53. Shri Ravi Kant, JS(ESW)
54. Shri S.C Bajpai, DGOF& Chairman/OFB
55. Shri Saurabh Kumar, Member (A&E)/OFB
56. Shri D.K. Mahapatra, Secretary/OFB
57. Sh. N.I. Laskar, Director(Budget), OFB
58. Ms Santosh, JS(Resettlement II, ESW)
59. Maj Gen A.P Bam, Managing Director, ECHS
60. Maj Gen Jagatbir Singh, DGR
61. Brig. M.H. Rizvi, Secretary
62. Lt Gen harish Thukral,DG(DC&W)
63. Cmde Gangesh Kumar, DGR Office
64. Gp Capt M Vijay, Director, DGR Office
65. Maj Gen Jagtar Singh, ADGAFMS(E&S)
66. Brig Subodh Mulgund, DDGAFMS(Stdn)
67. Shri Rajib Kumar Sen, Economic Advisor
68. Shri K.C Meena, DFA(Pension)
69. Smt Kusum Singh, JS(P&C)
70. Shri V Udaya Bhaskar, CMD
71. Dr. T. Suvarna Raju,CMD, HAL
72. Shri M. V Gowtama, CMD, BEL
73. RAdm (Retd) L V Sarat Babu, CMD,HSL
74. Shri D.K Hota, CMD,BEML
75. RAdm (Retd) Shekhar Mital, NM, CMD,GSL
76. CMDE R Ghosh (Retd), CMD,GRSE
77. Dr. D.K Likhi, CMD,MIDHANI
78. Cmde Rakesh Anand (Retd) CMD,MDL
79. Air Mshl HS Arora, DGAO
80. Shri DM Deshpande, CWP&A
81. Shri P Upadhyay, PDONA
82. Dr. JP Singh, Director, DPA
83. Brig Pradeep Arora, Dir,DoS
84. Shri V.K. Deshpande, AGM(Plg),GSL
85. Shri Sanjay Garg, JS(DIP)

2. At the outset, the Chairperson welcomed the Members of the Committee and informed them of the agenda for the Sitting. The Committee then invited the representatives of the Ministry of Defence and the Defence Services. The Chairperson welcomed the representatives to the Sitting of the Committee and drew their attention to Direction 55(1) of Directions by the Speaker, Lok Sabha.

3. Thereafter, the Chairperson requested the representatives of the Ministry of Defence to brief the Committee on various issues included in the agenda for the day. The Defence Secretary initiated the discussion by briefly touching upon Defence Services Estimates and other Demands for grants of the Ministry of Defence.

4. The Defence Secretary apprised the Committee about the steps taken by the Ministry to enhance allocation from the Ministry of Finance.

5. Further, a Power Point Presentation on General Defence Budget was made before the Committee. This was followed by detailed deliberations on the following issues:

(i) Inadequate budgetary provision to Defence in this year's Budget Estimates;
(ii) Process of preparing the Budget, resource mobilization and allocation of funds and assessment of requirements of the Services and other organizations;
(iii) Making Capital Budget as 'roll on and non- lapsable';
(iv) Budget outlay on modernisation of Forces; and
(v) Slow pace of expenditure by the Ministry of Defence as stated by the Ministry of Finance.

6. Thereafter, a Power Point Presentation on Defence Procurement Policy was made. This was followed by extensive discussion on the following points:

(i) The newly-formulated Defence Procurement Procedure (DPP 2016);

(ii) Strategic partnership with private sector;

(iii) Roadmap for `Make in India';

(iv) Dependence on import for arms and other defence equipment; and

(v) Support to Medium, Small and Micro Enterprises (MSME) in area of defence production.

7. Afterwards, the Ministry gave a Presentation on National Cadet Corps (NCC) and Sainik Schools in that order. This was followed by detailed discussions on the subjects and Members raised queries on the following issues:

(i) Percentage of NCC cadets who choose Defence Forces as their career;

(ii) Steps being taken to encourage students to join the Defence Forces;

(iii) Waiting list of schools for NCC units; and

(iv) Expansion of Sainik Schools.

The Committee took break for lunch and resumed the Sitting at 2:30 P.M.

8. After the lunch, the Vice Chief of Army Staff briefly touched upon the issue of threat perception from the point of view of the Army. Then, a Presentation was made on Army. This was followed by detailed discussions on the subject and Members raised queries on the following issues:

(i) Allocation of funds in BE 2017-18, which was lesser than projection;

(ii) Modernization process of the Services; and

(iii) Approval of the proposals of the Ministry of Defence pending with the Ministry of Finance, etc.

9. Thereafter, a Presentation was made on Air Force and pursued with deliberations on the subject which included issues such as the following:

(i) Inadequate Budgetary Provisions;

(ii) Shortage of Squadrons; and

(iii) Expansion of Training facilities; etc.

10. Thereafter, Presentation on Directorate General of Quality Assurance (DGQA) was made, which was followed by discussion on the following points:

(i) Transfer of some functions of DGQA to the manufacturing organisations;

(ii) Introduction of third party inspection agencies; and

(iii) Monitoring of quality of defence products,etc.

11. Thereafter, a Power Point presentation on Defence Public Sector Undertaking and Ordnance Factory Board (OFB) was made. This was followed by extensive discussion on the subjects which included the following:

(i) Benefit to DPSUs by the introduction of a new category of 'Buy Indian IDDM' in new procurement procedure;

(ii) Updating the capabilities of DPSUs and OFB both in manufacturing and design;

(iii) Quality and timely delivery of ammunition by OFB etc.; and

(iv) Downward trend in financial performances of some of the DPSUs.

12. Thereafter, a presentation was made on Ex-Servicemen Welfare and Ex-Servicemen Contributory Health Scheme and pursued with deliberations on the subject which included issues such as the following:

(i) Opening of ECHS Polyclinics in more parts of the country;

(ii) Resettlement of Ex-Servicemen with specific reference to Lateral induction of Servicemen in Central Para Military Forces and State Police Forces;

(iii) Non-payment of bills of private hospitals;

(iv) Misuse of ECHS facilities, etc.

13. The representatives of the Ministry of Defence replied to various queries/observations of Members. The Chairperson directed the representatives of the Ministry of Defence to furnish written replies to all the queries at the earliest.

A copy of verbatim record of the proceedings has been kept.

The Committee then adjourned.

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STANDING COMMITTEE ON DEFENCE (2016-17)

MINUTES OF THE EIGHTH SITTING OF THE STANDING COMMITTEE ON DEFENCE (2016-17)

The Committee sat on Thursday, the 23 February, 2017 from 1100 hrs. to 1730 hrs. in Committee Room No. 53, Parliament House, New Delhi.

PRESENT

Maj Gen B C Khanduri, AVSM (Retd) - Chairperson

Lok Sabha

2. Shri Suresh C Angadi
3. Shri Thupstan Chhewang
4. Col Sonaram Choudhary(Retd)
5. Shri H D Devegowda
6. Km Shobha Karandlaje
7. Dr Mriganka Mahato
8. Shri Rodmal Nagar
9. Shri A P Jithender Reddy
10. Ch Malla Reddy
11. Shri Rajeev Shankarrao Satav
12. Smt Mala Rajya Lakshmi Shah
13. Shri Partha Pratim Ray
14. Shri Dharambir Singh

Rajya Sabha

17. Shri Rajeev Chandrasekhar
18. Shri Madhusudan Mistry
19. Shri Praful Patel
20. Smt Ambika Soni
21. Dr Subramanian Swamy

SECRETARIAT

1. Smt Kalpana Sharma - Joint Secretary
2. Shri TG Chandrasekhar - Director
3. Smt Jyochnamayi Sinha - Additional Director
4. Shri Rahul Singh - Under Secretary

WITNESSES

List of Officers/representatives who attended the Sitting:-

1. Shri G Mohan Kumar, Defence Secretary
2. Air Marshal RKS Bhadauria, DCAS
3. Air Mshl HS Arora, DGAO
4. Air Mshl SB Deo, VCAS
5. Air Vice Mshl BR Krishna, ACAS(Plan)
6. Air Vice Mshl J Chalapati, ACAS(Projects)
7. Air Vice Mshl Pothureddy Subhash Babu, ACAS(Fin Plg)
8. AVM TP Singh, ACIDS(FP)
9. Brig Anurag Bhasin, DDG 'B', MAP
10. Brig K K Repswal, DDGW (PPC & Est)
11. Brig KC Panchanathan, DDG MO(C)
12. Brig Pradeep Arora, Dir,DoS
13. Brig Subodh Mulgund, DDGAFMS(Stdn)
14. Brig MH Rizvi, Secretary
15. Brig RK Sharma, DDG(TP)
16. Capt Satish Vasudevan, DNP
17. Cdr Praveen Varma, JDNP
18. Cmde Gangesh Kumar, DGR Office
19. Cmde Karunesh Kaushik, DACIDS(Bud)
20. CMDE R Ghosh (Retd), CMD,GRSE
21. Cmde Rakesh Anand (Retd) CMD,MDL
22. Col Rajeev Kapoor, Director(Budget)
23. Comdt Alok Negi, JD(Plans)
24. DIG Mukesh Purohit, PD(P&B)
25. Dr Subhash Chandra Sati, DG (NS & M)
26. Dr Zakwan Ahmed, CCR&D(R&M& Imp)
27. Dr Chitra Rajagopal, CCR&D (SAM)
28. Dr CP Ramanarayanan, DG(Aero)
29. Dr DK Likhi, CMD,MIDHANI
30. Dr G Athithan, DG (MED & CoS)
31. Dr G Satheesh Reddy, DG (MSS)
32. Dr Guru Prasad, CCR&D(PC& SI)
33. Dr JP Singh, Director, DPA
34. Dr Mala Iyengar, IFA (R&D)
35. Dr S Christopher Secy (R&D)
36. Dr Shashi Bala Singh, DG (LS)
37. Dr T Suvarna Raju,CMD, HAL
38. Dy Comdt Niranjan Pratap Singh, ADC to DGICG
39. Gp Capt M Vijay, Director, DGR Office
40. IG VD Chafekar, DDG(P&P)
41. Lt Gen AK Bhatt, DGMO
42. Lt Gen harish Thukral,DG(DC&W)
43. Lt Gen Sarath Chand, VCOAS
44. Lt Gen SK Shrivastava,DGBR
45. Lt Gen Suresh Sharma, E-in-C
46. LT GEN ASHOK AMBRE,DG LW&E
47. Lt Gen RV Kanitkar, QMG
48. Maj Gen AP Bam, Managing Director, ECHS
49. Maj Gen Jagatbir Singh, DGR
50. Maj Gen Jagtar Singh, ADGAFMS(E&S)

51. Maj Gen Manoj Pande, ADG MO(B)
52. Maj Gen Sanjay Agarwal, DG Works
53. Maj Gen Sanjeev Jain , DG MAP
54. Maj Gen SPS Kohli, ADGW
55. Maj Gen Digvijay Setia, ADG(LW&E)
56. Ms Santosh, JS(Resettlement II, ESW)
57. Ms J Manjula, DG (ECS)
58. Ms Nabanita R Krishnan, Director, P&C
59. Ms Surina Rajan, Addl Secy (DP)
60. RAdm (Retd) L V Sarat Babu, CMD,HSL
61. RAdm (Retd) Shekhar Mital, NM, CMD,GSL
62. Rear Admiral DK Tripathi, ACNS(P&P)
63. Sarath Chandran, Adhikari (RO)
64. Sh M Hafizur Rahaman, CC R&D (TM& HR)
65. Sh NI Laskar, Director(Budget), OFB
66. Shri AK Gupta, Secy(DP)
67. Shri AN Das, Addl FA(AN) & JS
68. Shri Ajay Kumar Sharma, Addl DG
69. Shri Ajay Singh, Chief Executive, CW&E
70. Shri AK Bhateja, Director, BF&A
71. Shri Ashwini Kumar, Addl FA(AK)& JS
72. Shri Bharat Khera, JS(Air/BR)
73. Shri DK Hota, CMD,BEML
74. Shri DK Mahapatra, Secretary/OFB
75. Shri DM Deshpande, CWP&A
76. Shri GS Rajeshwaran, Addl DG
77. Shri JRK Rao, Addl Secy(J)
78. Shri Jiwesh Nandan, JS
79. Shri Jojneswar Sharma, DG
80. Shri KC Meena, DFA(Pension)
81. Shri Kedar Burande, DDG(Adm)
82. Shri M V Gowtama, CMD, BEL
83. Shri P Daniel, Addl DG
84. Shri P Upadhyay, PDONA
85. Shri Prabhu Dayal Meena, Secy(ESW)
86. Shri Prachur Goel, Addl DG
87. Shri Pravin K Mehta, DG (ACE)
88. Shri RK Karna, Addl FA(RK) & JS
89. Shri Rajendra Singh, DG ICG
90. Shri Rajib Kumar Sen, Economic Advisor
91. Shri Ravi Kant, Addl Secy (R)
92. Shri Ravi Kant, JS(ESW)
93. Shri SC Bajpai, DGOF& Chairman/OFB
94. Shri Sanjay Garg, JS(DIP)
95. Shri Saurabh Kumar, Member (A&E)/OFB
96. Shri Subir Mallick, Addl FA & JS
97. Shri Sudhir Mishra, CCR&D (Brahmos)
98. Shri Sunil Kumar Kohli, FA (DS)
99. Shri Surya Praksh, Dir(L&C)

100. Shri V Udaya Bhaskar, CMD
101. Shri VK Deshpande, AGM(Plg),GSL
102. Shri Rahul Dua, Sr Addl DG
103. Smt Devika Raghuvanshi, JS (Navy)
104. Smt Kusum Singh, JS(P&C)
105. Smt Anuradha Mitra, FA (Acq)
106. Smt Dharitri Panda, Addl FA(DP) & JS
107. Smt Maulishree Pande, Dir (Fin/Bud)
108. Smt Shalini Pandey, DDG (C&Crd)
109. Smt Smita Nagaraj, DG(Acq)
110. VAdm Ajit Kumar P, DCIDS(PP&FD)
111. Vice Admiral Karambir Singh, VCNS

2. At the outset, the Chairperson welcomed the Members of the Committee and informed them about the agenda for the Sitting. The Chairperson welcomed the representatives to the Sitting of the Committee and drew their attention to Direction 55(1) of Directions by the Speaker, Lok Sabha.

3. The Chairperson initiated the discussion and requested the representatives of the Ministry of Defence to brief the Committee on various issues included in the agenda for the day.

4. The representatives of the Ministry of Defence commenced their briefing through a PowerPoint presentation on Defence Research and Development. This was followed by detailed deliberations on following issues:

(i) Allocation of funds and expenditure,

(ii) Accountability for scientists in DRDO,

(iii) Efforts towards 'Make in India',

(iv) Export of DRDO developed equipments,

(v) grievance resolution mechanism,

(vi) Involvement of private industry in Defence research, etc.

5. Thereafter, a presentation was given on Navy and Joint Staff which was followed by discussion on following points:

(i) Shortfall between required and allocated budget,

(ii) Inadequacies in capital budget,

(iii) Shortage of manpower,

(iv) Depletion in fleet strength,

(v) Obsolescence,

(vi) Delay in delivery of vessels by Shipyards,

(vii) National War Memorial,

(vii) Operational preparedness, etc.

6. Thereafter, a presentation on Coast Guard Organization was made before the Committee. This was followed by queries from Members on various issues which included shortfall in provision of funds of funds and state of coastal security.

The Committee took break for lunch and resumed the Sitting at 1430 hrs.

7. A presentation was made on Directorate General Defence Estate (DGDE) and pursued with deliberations on the subject. Members made various queries on the following points:

(i) Blocking of roads used by ordinary citizens by DGDE,

(ii) Encroachment of Defence Lands by civilians and removal of the same with the help of State Governments,

(iii) Digitisation of records in DGDE,

(iv) Financial problems of Cantonment boards,

(v) Non-payment of service charges by Army,

(vi) Dilapidated condition of schools in Cantonment Boards, etc.

8. The Ministry gave presentation on Military Engineer Services. This was followed by detailed discussions on the subjects and Members asked questions on the following issues:

(i) Delay in completion of projects,

(ii) Adoption of state-of-the-art technology, etc.

9. The Ministry made presentation on Married Accommodation Project. This was followed by detailed discussions on the subjects and Members asked questions on the following issues:

(i) Progress of phase-II and phase-III of MAP,

(ii) Amendments in MAP works procedure,

(iii) Use of new technologies for construction of dwelling units, etc.

10. Thereafter, a presentation was made on Border Roads Organization (BRO) which was followed by discussion on the following points:

(i) Status of Border connectivity,

(ii) Financial crunch faced by BRO,

(iii) Long Term Roll on Works Plan,

(iv) Maintenance and snow clearance grants, etc.

11. The Chairperson directed the representatives of the Ministry of Defence to furnish written replies to all the queries at the earliest.

A copy of verbatim record of the proceedings has been kept.

The Committee then adjourned.

STANDING COMMITTEE ON DEFENCE

MINUTES OF THE NINTH SITTING OF THE STANDING COMMITTEE ON DEFENCE (2016-17)

The Committee sat on Friday, 03 March, 2017 from 1130 hrs. to 1215 hrs. in Committee Room 53, Parliament House, New Delhi.

PRESENT

Maj Gen B C Khanduri, AVSM (Retd) - Chairperson

Lok Sabha

2. Shri Suresh C Angadi
3. Shri Shrirang Appa Barne
4. Shri Thupstan Chhewang
5. Shri H D Devegowda
6. Shri B. Senguttuvan
7. Shri Rodmal Nagar
8. Shri Ch Malla Reddy
9. Shri Rajeev Shankarrao Satav
10. Smt Mala Rajya Lakshmi Shah
11. Shri Partha Pratim Ray
12. Shri Dharambir Singh
13. Smt Pratyusha Rajeshwari Singh

Rajya Sabha

14. Shri A U Singh Deo
15. Shri Harivansh
16. Shri Madhusudan Mistry
17. Shri Sanjay Raut
18. Smt Ambika Soni
19. Dr Subramanian Swamy

SECRETARIAT

1. Smt. Kalpana Sharma - Joint Secretary
2. Shri T G Chandrasekhar - Director
3. Smt Jyochnamayi Sinha - Additional Director
4. Shri Rahul Singh - Under Secretary

2. At the outset, the Chairperson welcomed the Members of the Committee and informed them about the agenda for the sitting. The Committee then took up for consideration the following draft Reports:-

(i) Twenty-Eighth Report on 'Demands for Grants of the Ministry of Defence for the year 2017-18 on General Defence Budget, Border Roads Organisation, Indian Coast Guard, Military Engineer Services, Canteen Stores Department, Directorate General Defence Estates, Defence Public Sector Undertakings, Welfare of Ex-Servicemen, Defence Pensions and Ex-Servicemen Contributory Health Scheme (Demand No. 19 & 22)'.

(ii) Twenty-Ninth Report on 'Demands for Grants of the Ministry of Defence for the year 2017-18 pertaining to Revenue Budget of Army, Navy and Air Force (Demand No. 20)'.

(iii) Thirtieth Report on 'Demands for Grants of the Ministry of Defence for the year 2017-18 pertaining to Revenue Budget of Ordnance Factories, Defence Research and Development Organisation, Directorate General of Quality Assurance and National Cadet Corps (Demand No. 20)'.

(iv) Thirty-First Report on 'Demands for Grants of the Ministry of Defence for the year 2017-18 on Capital Outlay on Defence Services, Defence Planning and Procurement Policy (Demand No. 21)'.

3. ***.....**

4. The Committee authorized the Chairperson to finalise the above draft Reports and present the same to the House on a date convenient to him.

The Committee then adjourned.

* Does not pertain to this report.

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