25

STANDING COMMITTEE ON DEFENCE (2007-2008)

FOURTEENTH LOK SABHA

MINISTRY OF DEFENCE

[Action Taken by the Government on the recommendations/observations contained in the 14th Report of the Standing Committee on Defence (Fourteenth Lok Sabha) on 'Defence Research & Development Organisation (DRDO)']

TWENTY-FIFTH REPORT

LOK SABHA SECRETARIAT
NEW DELHI

March, 2008/*Phalguna,* 1929 *(Saka)*

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Presented to Lok Sabha on 19.3.2008
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LOK SABHA SECRETARIAT
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COMPOSITION OF THE STANDING COMMITTEE
ON DEFENCE (2007-08)

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6. Shri Rahul Singh — *Committee Officer*

PREFACE

I, the Chairman, Standing Committee on Defence (2007-08) having been authorized by the Committee to present the Report on their behalf, present this Twenty-Fifth Report of the Committee on Action Taken by the Government on the recommendations contained in the Fourteenth Report of the Committee (Fourteenth Lok Sabha) on 'Defence Research and Development Organisation (DRDO)'.

2. The Fourteenth Report was presented to Lok Sabha and laid in Rajya Sabha on 16.3.2007 and it contained 55 recommendations/ observations. The Ministry of Defence have furnished their Action Taken Replies on all the recommendations/observations on 3.7.2007. The Committee took oral evidence of the representatives of the Ministry of Defence to have clarifications on certain issues arising out of the action taken replies on 11.12.2007.

3. The Draft Action Taken Report was considered and adopted by the Committee at their sitting held on 10.3.2008.

4. An analysis of action taken by the Government on recommendations contained in the Fourteenth Report of the Standing Committee on Defence (Fourteenth Lok Sabha) is given in Appendix-II.

N EW D ELHI;
17 *March,* 2008
27 *Phalguna,* 1929 *(Saka)*

BALASAHEB VIKHE PATIL,
Chairman,
Standing Committee on Defence.

CHAPTER I

REPORT

The Report of the Standing Committee on defence deals with action taken by the Government on the recommendations/observations contained in their Fourteenth Report (Fourteenth Lok Sabha) on 'Defence Research & Development Organisation' which was presented to Lok Sabha and laid in Rajya Sabha on 16.3.2007.

2. The Fourteenth Report (Fourteenth Lok Sabha) contained 55 observations/recommendations on the following aspects:

Sl.No.	Para No.	Subject
1.	1.11 to 1.14	Review of the functions of DRDO
2.	2.14 to 2.17	Organisational Structure of DRDO
3.	3.4 to 3.7	Brain Drain in DRDO
4.	4.5 to 4.6	Budget and Expenditure
5.	5.24 to 5.33	Indigenous Research and Development (R&D) activities
6.	6.11 to 6.13	Effective interaction with the users
7.	7.3 to 7.4	Projects abandoned by DRDO
8.	8.21 to 8.22a	Performance of Projects
9.	8.23 to 8.27	Main Battle Tank (MBT) Arjun
10.	8.40 to 8.43	Design and Development of Kaveri Engine for Light Combat Aircraft (LCA)
11.	8.55 to 8.57	Integrated Guided Missile Development Programme (IGMDP)
12.	9.7	Research on Stress Management
13.	10.21 to 10.30	Private Sector Participation in Defence R&D

3. Action Taken Replies have been received from the Government in respect of all the recommendations/observations contained in the Report. They are broadly categorized as follows:

(i) Recommendations/Observations which have been accepted by the Government:

Para Nos. 1.11, 1.12, 1.13, 2.17, 3.4, 3.7, 4.5, 4.6, 5.24, 5.25, 5.26, 5.27, 5.28, 5.29, 5.30, 5.31, 6.11, 6.12, 6.13, 7.4, 8.21, 8.22, 8.22a, 8.23, 8.25, 8.26, 8.27, 8.40 to 8.43, 8.55, 8.57, 9.7, 10.21 to 10.25, 10.27 to 10.29 (42 Recommendations)

(ii) Recommendations/Observations which the Committee do not desire to pursue in view of the Government's replies:

Para Nos. : 2.15, 2.16, 5.32, 7.3, 8.24 (5 Recommendations)

(iii) Recommendations/Observations in respect of which replies of the Government have not been accepted by the Committee:

Para Nos. 2.14, 3.5, 3.6 (3 Recommendations)

(iv) Recommendations/Observations in respect of which final replies of the Government are still awaited.

Para Nos. 1.14, 5.33, 8.56, 10.26, 10.30 (5 Recommendations)

4. The Committee trust that utmost importance will be given to implementation of all the recommendations made by the Committee except those the Committee do not desire to pursue in view of Government's replies. In cases, where it is not possible for any reason to implement the recommendations in letter and spirit, the matter should be reported to the Committee with reasons for non-implementation. The Committee observe that the Ministry of Defence have failed to give specific responses to a number of recommendations taking shelter under the plea that an independent Review Committee has been constituted to review the organizational status of DRDO. Since this Review Committee was expected to submit its report in February, 2008, the Committee desire that action taken notes on the recommendations/observations contained in Chapter-I and final replies to the recommendations contained in Chapter-V of the Report be furnished to the Committee within one month of the presentation of the Report.

5. The Committee will now deal with the action taken by the Government on some of their recommendations contained in the Fourteenth report.

Review of the functioning of DRDO

Recommendation (Para No. 1.12)

6. The Committee were not happy that during X Plan (2002-2007), against the target fixed to reach 70% indigenisation only 30-35% target could be achieved. This gave an impression to the Committee that the country was still largely dependent on imports of Defence products and the DRDO even after 48 years of its formation had not been able to achieve its targeted mission of self-reliance in Defence production. The Committee felt that there was an urgent need for a thorough review of its functioning and its organizational/structural set up, in order to identify the strength and weaknesses and to improve and strengthen this organisation to increase its efficiency to enable it to achieve organisational goals.

7. The Ministry of Defence in their action taken reply, have stated:

> "DRDO is developing only for defence-critical/denied technologies and strategic systems. Acceptance of DRDO developed systems and their subsequent production and induction depends on Users and identified production agencies (DPSUs and OFs). Achieving self-reliance is a responsibility that has to be met through national effort by MOD, DPSUs, OFs, private industries and DRDO jointly.
>
> Independent Review Committee, under the chairmanship of Dr. P. Rama Rao, is studying the issues concerning making DRDO more effective in a changing industrial and economic scenario."

8. In a subsequent reply, the Ministry of Defence informed that the Committee headed by Dr. P. Rama Rao is required to review the present organizational status and recommend required Institutional, Management, Administration and financial arrangements, to meet specified objectives. The time frame of the Committee, which was constituted on 8th February 2007 is upto 7th February 2008.

9. The Committee appreciate that as recommended by the Committee, an Independent Review Committee has been constituted to review the organizational status of DRDO. The Review Committee is headed by Dr. P. Rama Rao, former Secretary to Department of Science and Technology and is expected to submit its report in February 2008. The Committee would like to be apprised of the Review Committee's recommendations and the time frame for implementation of those recommendations.

Secretary, DDRD heading other Organisations

Recommendation (Para No. 2.14)

10. The Committee had expressed their displeasure to note that Scientific Advisor to Raksha Mantri had been assigned multifarious responsibilities. Besides this he was holding, the posts of Director-General of Defence Research and Development Organisation and Secretary (R&D). He was also the Director-General of Aeronautical Development Agency. The Committee strongly felt that any Officer who holds various posts simultaneously cannot be expected to devote adequate time and energy to visit R&D laboratories under him and to contact other scientific labs for motivational leadership purpose. This, in turn, dilutes the benefits of collective wisdom, different sets of mind sets give efficiency, accountability, proper planning and also efficacy of the organization. The Committee felt that one person should not be entrusted with a number of responsibilities by making him hold a number of posts simultaneously. The Committee had also desired that the Government should fill all the vacancies urgently, so that the organization would be more purposeful and productive. The Committee desired to be apprised of the progress made by Government in this regard.

11. The Ministry in their action taken reply, have stated:

"DRDO is administered through a collegiate management council headed by Secretary, Defence Research and Development with all the Chief Controllers and Financial Advisor as members of the council. Each Chief Controller has functional autonomy with regard to the activities of the Laboratories in this cluster. This approach is necessitated both for specialization as well as management and the above said practice is working well over the past 15 years.

The Aeronautical Development Agency (ADA) is a society wholly funded by DRDO and has a Programme Director for LCA also functioning as Director, ADA, with the clear delineation of financial and technical jurisdiction, akin to the Director of a DRDO Laboratory.

Nevertheless, the whole issue of management of DRDO and its associate setup is being looked into by Dr. P. Rama Rao Committee."

12. In the context of the Secretary, Department of Defence Research and Development (DDRD) holding three other positions *viz*. Scientific Advisor to Raksha Mantri, Director General of DRDO, and Director General of Aeronautical Development Agency, the Committee felt that one person should not be entrusted with a number of responsibilities as it could adversely affect the efficient functioning of the concerned organisations. The Ministry of Defence have, *inter-alia* , stated in their response that the whole issue of management of DRDO and its associate set up is being looked into by Dr. P. Rama Rao Committee. The Committee wish to point out in this regard that the terms of reference of Rama Rao Committee, however, does not disclose this aspect. In order to remove any doubt in this regard the Committee desire that this issue should be explicitly referred to the Rama Rao Committee for its consideration. Irrespective of the recommendation that might be made by the Independent Review Committee on this issue, the Committee reiterated their earlier recommendations that one-man one-post principle should be strictly adhered to and the posts already created for Director General of DRDO, Scientific Advisor to RM and DG, Aeronautical Development Agency (ADA) should be filled up by different officers without any further delay.

Brain Drain in DRDO

Recommendation (Para Nos. 3.4, 3.5 and 3.6)

13. The Committee had noted with serious concern that the proposal to provide incentives for scientists of DRDO had been pending for consideration with the Government since 2001 and despite all the Parliamentary assurances, the Ministry had not taken any action to implement the proposed incentives. The Committee therefore, desired that immediate steps be taken by the Ministry to clear the said incentive proposal and also think of providing other perks and facilities in order to attract best, talented employable technical manpower and to contain the existing brain drain to further strengthen the organization so that the research work should not suffer.

14. The Committee held a view that scientists have been the Intellectual property of the country and their contribution to the nation was peerless which could not be equated by providing only monetary benefits to them. The Committee had, therefore, strongly recommended the Government to take suitable and firm measures for encouragement to scientists by providing adequate freedom to do research work. The Government should create an atmosphere of trust and have close interaction with them to address their problems/grievances so that they could concentrate on their research work.

15. The Ministry in their action taken reply, have stated as under:

"A comprehensive proposal has already been submitted by the DRDO and is under active consideration by the Government. Comprehensive proposal has also been submitted to Sixth Central Pay Commission.

DRDO has been provided with some level of flexibility in functioning within the Government system. A conducive ambience is being provided in work place as well as in Residential Quarters/ Campus.

The approach to tackle the serious problem of attrition is multi-pronged. A comprehensive proposal has been submitted to the Sixth Central pay Commission and also being taken up separately with the Cabinet Committee for providing incentives to the scientists."

16. A proposal for grant of incentives to the Scientists of DRDO was reportedly submitted in July 2001 and a revised proposal submitted to Raksha Mantri on 26 December 2006. As directed by the Raksha Mantri, an in-depth study was assigned to the Administrative Staff College of India (ASCI) and on the basis of the ASCI recommendation, an incentive package to DRDO Scientists has been proposed to the Raksha Mantri. ASCI's proposal has also reportedly been submitted to the Sixth Pay Commission. Some of the incentives proposed are as follows:

(i) Special Intellectual Capital Pay @30 per cent of basic pay under FR 9(25) to all Scientists.

(ii) Three increments at the time of initial recruitment to Scientists at all levels.

(iii) Enhancement of professional update allowance from Rs. 5000 to Rs. 25,000 p. a.

(iv) VRS for Scientists who have completed 20 years of service to facilitate migration to industries and to generate committed defence production.

(v) Enhancement of retirement age by 2 years *i.e.* upto 62 years for all Scientists and 65 years for selective few.

(Please see Annexure-A and B regarding full proposals).

17. During the discussion held with the representatives of the Ministry of Defence regarding action taken by the Government, a representative submitted the following before the Committee:

> "As far as the incentives to the scientists are concerned, they were not earth shaking incentives. They are basically incentives to keep the young scientists attracted. Now the Government is in the process of accepting that. It has gone through the financial implications of that".

> "IT Companies are currently running attrition, especially in Bangalore and Hyderabad between 18 to as high as 30 per cent. We peaked around 24 per cent or so and we have come down now between 19-20 per cent."

18. The Committee are not satisfied with the reply of the Ministry of Defence. The Committee wonder why the incentive package for DRDO Scientists proposed as early as in June 2001, could not be decided by the Government during the last six years. It has now been stated that the proposal for incentive package has been submitted to the Sixth Pay Commission. It is a well known fact that grant of incentives is an administrative matter and should have been decided by the Government without referring the matter to the Sixth Pay Commission. The Committee further emphasise that incentives to Scientists and Engineers should not be one time affair but should be linked to their achievement in R&D from time to time. The Committee hope that the Government will take expeditious decision on the proposed incentive package to DRDO Scientists. The Committee have however, reservations about one of the incentives proposed in the package which relates to Voluntary Retirement Scheme (VRS) for Scientists, who have completed 20 years of service. The Committee feel that since incentives are aimed at attracting and retaining talented scientists in DRDO, agreeing to the proposed VRS may defeat this very objective.

Since a number of scientists have already left DRDO as indicated in the original report, the Committee stress that responsibility should be fixed on officers who have caused delay in grant of incentive package by referring the matter to the Sixth Pay Commission.

National Policy for defence Recruitment

Recommendation (Para No. 3.7)

19. The Committee had, desired that a Comprehensive National Policy should be formulated to recruit and retain talented and

experienced scientists who would make the pursuit of science a viable academic and commercial proposition.

20. The Ministry of Defence have stated in their reply that the Government is in full agreement with the recommendations of the Standing Committee on Defence.

21. The reply of the Ministry of Defence is silent as to when action will be taken to formulate Comprehensive National Policy to recruit and retain talented scientists. The Committee hope that urgent action will be taken in this regard under intimation to the Committee.

Augmenting R&D Budget

Recommendation (Para Nos. 4.5 & 4.6)

22. The Committee found that there was a steady decline in the percentage of R&D budget for DRDO out of the total Defence Budget which has come down from 6.17 per cent in 2002 to 4.87 per cent in 2004. The Committee also noted that the amount allocated for R&D activities were not fully utilized during the years 2004-05 and 2005-06 because of non-materialisation of certain commitments against some projects/schemes. The Committee had further found that the percentage spending on R&D activities to the Defence Budget was very low as compared to the advanced and neighbouring countries. The Committee were not satisfied with the reasons advanced by the Government for non-utilization of the allocated amount for R&D activities which was very meagre in comparison to the total Defence Budget and also very less in comparison to the budgets in other developed countries.

23. The Committee had also been informed that 8 to 10 per cent of the total DRDO budget was being spent on fundamental research. The Committee were not happy with the existing state of affairs of the utilization of fund for existing R&D activities in DRDO. The Committee had felt that beside utilization of the budget allocated for R&D activities in DRDO, there was an urgent need for an increase in the total budget for R&D activities so that new and basic research work in DRDO could adequately be funded and the country's dependency on other countries in critical and high technology was minimized, thus enabling the country to become self-reliant in Defence production. The Committee, as recommended in their earlier Ninth Report (14th Lok Sabha), emphasised that Defence Public Sector Undertakings and Ordinance Factories should have their in-house R&D centres so that the need to approach DRDO for small upgradation could be avoided. The Committee had also desired DRDO to facilitate

DPSUs and ordnance factories to set up necessary infrastructure and technical know-how to establish and strengthen their R&D Centres in advisory capacity.

24. The Committee had further desired that R&D budget should be at least 14 to 15% of the total defence budget of the country as more and more research and product development opportunities are likely to come India's way due to changed international scenario.

25. The Ministry in their action taken reply, have stated:

"Currently DRDO is spending about 6% of the Defence Budget. There have been discussions regarding increasing this allocation for conduct of more and more R&D activities for the three Services. As per Defence Procurement Procedure (DPP)-2006, the indigenous development under "Make" category can now be directly allocated to industry either with the help of DRDO or independent of DRDO with direct funding from MOD. There are also discussions wherein R&D allocations at Ordnance Factories and DPSUs need also to be increased. DRDO would mainly concentrate on highly complex or strategically sensitive or on futuristic technological development or on creating state-of-the-art test and evaluation facilities.

The requirement to increase budget provision for DRDO will be taken up progressively based on these considerations.

Non-utilisation of the allotted grants in full, during 2004-05 and 2005-06 was largely due to the reduced requirements against certain CCS approved programmes and special schemes. Subsequently allotted funds were fully utilized in 2006-07.

Defence PSUs, like Bharat Dynamics Limited (BDL) has in-house Design and Engineering Division which carries out limited R&D activities. Hindustan Aeronautics Limited (HAL) has nine R&D centres for design, development and upgradation of military aircrafts, helicopters, small engines, etc. Mishra Dhatu Nigam (MIDHANI) Limited and HAL have collaboration in R&D activities with DRDO laboratories. Bharat Earth Movers Limited (BEML) has established R&D centre and also liaised with DRDO for research and development work. Bharat Electronics Limited has two established R&D centres and is also closely working with several DRDO Laboratories."

26. In reply to a question on increasing/revision of the R&D budget, the Ministry stated as under:—

> "DRDO has been consistently requesting MoD to evolve a policy to have a budget provision within the Defence Budget for procurement of DRDO developed Systems (Rupees 1,50,000 cr. for next 15 years *i.e.* 10,000 cr./year). Achieving this target would require national effort by the MoD, Production Agencies, DPSUs and Ordinance Factories and involving Private Sector in a big way.
>
> National Policy on self-reliance is essential. Only then more R&D will be undertaken by DRDO/Industries. The following are some significant points for increasing the R&D budget:
>
> — Assurance of accepting indigenously developed items.
>
> — Assurance of Minimum Order Quantity (MOQ).
>
> — Assurance of accepting MK-I and continuous development.
>
> — Freedom to DRDO to choose development partners from industries, both in public and private.
>
> — Enhanced spending in academic research and privately recognized R&D Institutions."

27. In view of the need for promoting indigenous production and self reliance in Defence requirements, the Committee had recommended that atleast 14 to 15% of the total Defence budget be spent on Defence R&D. The Committee, however, are constrained to note that nothing has been mentioned in the Government's reply about the action proposed in this regard. The Committee urge the Ministry of Defence to evolve a policy as proposed by DRDO to have budget provisions within the Defence budget for procurement of DRDO developed systems and take immediate steps for increasing the R&D Budget.

Instrumentation and Trial Ship

Recommendation (Para No. 5.26)

28. The Committee had noted the problems faced by DRDO in the matter of non-availability of platform for trials of warheads for the Navy, as the ships go on exercises. The Committee felt that a better coordination between DRDO and Navy could easily solve this bottleneck and also cut short the time frame in development and testing of weapon system. The Committee, therefore, felt that Ministry should

make concerted efforts in this direction so that testing and trials platforms may not be a problem any more.

29. The Ministry in their action taken reply, have stated:—

"DRDO and Indian Navy have developed very-close working relationship over the years and the situation has improved very much.

DRDO has also undertaken building a test and evaluation ship to further reduce the time for development and testing."

30. In reply to a question about non-availability of platform and building of test and evaluation ship, the Ministry submitted the following information:—

"Availability of ships/platforms is subject to operational commitments of the Navy. Navy provides platforms, to the extent feasible, after meeting its operational commitments.

Further the availability of ships for trials gets restricted to fair weather periods only, since trials cannot be undertaken in rough sea/weather conditions.

A project to build an "Instrumentation & Trials Ship' for DRDO is under consideration. Specifications and details of equipment fit for such a ship are under preparation. The estimated cost of basic ship, including the cost of Navy specific equipment, is Rs. 400 cr. Scientific/trials equipment would be provided by the respective user laboratories."

31. The Committee had recommended in the context of non-availability of platform for DRDO to conduct trial of warheads that concerted efforts be made to remove this bottleneck. The Committee note with satisfaction that a project at an estimated cost of Rs. 400 crore has since been proposed to build an 'Instrumentation & Trails Ship' for DRDO trials of warheads. The Committee desire that decision on implementation of the project be taken early and the Committee be informed of schedule of completion of the project.

Corporatisation of Ordnance Factories

Recommendation (Para No. 5.31)

32. The Committee were given to understand that the ordnance factories do not have a system to prepare balance sheet in order to

have an appraisal of their cost of products and materials etc. The Committee had therefore, desired that Ordnance Factories should also prepare their balance sheet on the line of Corporate. Total accounting system of DPSUs should go as per standard accounting system of Indian Council of Chartered Accountant. The Committee were also of the view that in order to make ordnance factories, more progressive, productive, competitive and financially viable, there was an urgent need to turn them into a Corporation and allow them to select vendors and to take decision in financial and R&D matters independently because in the competitive age they must have full autonomy in order to have level playing field.

33. The Ministry in their action taken reply, have stated:—

"It has been decided to introduce Commercial Accounting Format in Ordnance Factories. The finalized formats have been forwarded for concurrent of Comptroller and Auditor General. The Kelkar Committee (Part II) has recommended that the Ordnance Factories should be corporatized. This recommendation was examined and the Government has decided not to corporatize Ordnance Factories. It has also been decided that the present position would continue for some time.

In order to make Ordnance Factories more progressive, productive, competitive and financially viable, substantial financial powers have been delegated by the Government to Ordnance Factories, including full power for R&D."

34. The Committee are glad to note that in pursuance of the Committee's recommendation, it has been decided to introduce Commercial Accounting Format in Ordnance Factories. The Committee hope that it would be possible to Introduce the changes from the ensuing financial year (2008-09) after having the concurrence of C&AG. As regards the Government's decision not to corporatise the Ordnance Factories for the present, no reasons have been advanced as to what prompted such a decision. The Committee would like to be apprised of the same.

CHAPTER II

RECOMMENDATIONS/OBSERVATIONS WHICH HAVE BEEN ACCEPTED BY THE GOVERNMENT

Recommendation No. 1 (Para No. 1.11)

The Committee note that the DRDO was formed in 1958 with an objective to provide Scientific and technological support to Armed Forces through design and development of new and sophisticated equipment to meet their operational requirements. The main objective of DRDO is the establishment of capability for indigenous production of equipment with a view to attain self-reliance in defence requirements. This mandate of DRDO is accomplished through 50 Laboratories/ Establishments whose activities are organised through specific projects.

Reply of the Government

DRDO is primarily responsible for design and development up to Transfer of Technology (ToT) stage. Subsequent production and life cycle support is provided by production agency. DRDO provides back-to-back support to production agency on as required basis.

Recommendation No. 1 (Para No. 1.12)

The Committee are not happy that during 10th Plan (2002-2007), against the target fixed to reach 70% indigenisation only 30-35% target could be achieved. This gives an impression to the Committee that the country is still largely dependent on imports of Defence products and the DRDO even after 48 years of its formation has not been able to achieve its targeted mission of self-reliance in Defence production. The Committee feel that there is an urgent need for a thorough review of its functioning and its organizational/structural set up, in order to identify the strength and weaknesses and to improve and strengthen this organisation to increase its efficiency to enable it to achieve organisational goals.

Reply of the Government

DRDO is developing only for defence-critical/denied technologies and strategic systems. Acceptance of DRDO developed systems and their subsequent production and induction depends on Users and

identified production agencies (DPSUs and OFs). Achieving self-reliance is a responsibility that has to be met through national effort by MoD, DPSUs, OFs, private industries and DRDO jointly.

Independent Review Committee, under the chairmanship of Dr. P. Rama Rao, is studying the issues concerning making DRDO more effective in a changing industrial and economic scenario.

Comments of the Committee

(Please *see*Para 9 of Chapter-I)

Recommendation No. 1 (Para No. 1.13)

The Committee are of the view that in order to achieve the objective of self-reliance apart from Defence PSUs and Ordnance Factories, private participation should also be encouraged and re-oriented in the research and development areas, where they have expertise and capability in Defence production by funding the relevant organizations.

Reply of the Government

Partnership with industry is encouraged in a big way and all the major current projects of DRDO are using services of Indian industry proactively for development of components and sub-systems. DPSUs have also been outsourcing the production services from numerous industries. As per Defence Procurement Procedure (DPP)-2006, under "Make" category, R&D tasks for systems can be directly given to DPSUs and private industries. DRDO has already more than 400 Industrial Partners in its various projects.

Defence PSU, like Hindustan Aeronautics Limited (HAL) is encouraging private industries in R&D areas wherever these have expertise and capabilities.

Recommendation No. 2 (Para No. 2.17)

The Committee have been informed that the Space Commission/ Atomic Energy Commission enjoys greater autonomy in its functioning particularly for teaming up with the industry. The Committee, keeping in view the disappointing performance of DRDO strongly recommend to the Government the complete review of the structure and functioning of DRDO including providing greater autonomy by appointing an independent Committee of Experts/professionals, on the lines of Atomic Energy Commission and Indian Space Research

Organisation (ISRO) so that it could achieve its targeted mission of self-reliance in Defence sector.

Reply of the Government

Independent Review Committee, under the chairmanship of Dr. P. Rama Rao, is studying the issue of autonomy for DRDO.

Recommendation No. 3 (Para No. 3.4)

The Committee are constrained to note that DRDO has been facing problem of shortage of scientists to the extent of 1404 scientists, as they have left DRDO in view of the lucrative job opportunities available to them in the private sector and other organizations. The Committee take note of the fact that the organisation has been facing this serious challenge to retain its trained manpower.

Reply of the Government

DRDO has presented its case effectively to the 6th Pay Commission to take cognizance of the attrition and provide for reasonable pay structure to keep talents attracted to DRDO.

Comments of the Committee

(Please *see* Para 18 of Chapter-I)

Recommendation No. 3 (Para No. 3.7)

The Committee, therefore, desire that a comprehensive national policy should be formulated to recruit and retain talented and experienced scientists who would make the pursuit of science a viable academic and commercial proposition.

Reply of the Government

Government is in agreement with the recommendations of the Standing Committee on Defence.

Comments of the Committee

(Please *see* Para 21 of Chapter-I)

Recommendation No. 4 (Para No. 4.5)

The Committee find that there is a steady decline in the percentage of R&D budget for DRDO out of the total Defence Budget which has

come down from 6.17 per cent in 2002 to 4.87 per cent in 2004. The Committee also note that the amount allocated for R&D activities were not fully utilized during the years 2004-05 and 2005-06 because of non-materialisation of certain commitments against some projects/ schemes. The Committee further find that the percentage spending on R&D activities to the Defence Budget is very low as compared to the advanced and neighbouring countries. The Committee are not satisfied with the reasons advanced by the Government for non-utilization of the allocated amount for R&D activities which is very meagre in comparison to the total Defence Budget and also very less in comparison to the budgets in other developed countries.

Reply of the Government

Currently DRDO is spending about 6% of the Defence Budget. There have been discussions regarding increasing this allocation for conduct of more and more R&D activities for the three Services. As per Defence Procurement Procedure (DPP)—2006, the indigenous development under "Make" category can now be directly allocated to industry either with the help of DRDO or independent of DRDO with direct funding from MoD. There are also discussions wherein R&D allocations at Ordnance Factories and DPSUs need also to be increased. DRDO would increasingly concentrate on highly complex or strategically sensitive or on futuristic technological development or on creating state-of-the-art test and evaluation facilities.

The requirement to increase budget provision for DRDO will be taken up progressively based on these considerations.

Non-utilisation of the allotted grants in full, during 2004-05 and 2005-06 was largely due to the reduced requirements against certain CCS approved programmes and special schemes. Subsequently allotted funds were fully utilized in 2006-07.

Comments of the Committee

Please *see* para 27 of Chapter-I)

Recommendation No. 4 (Para No. 4.6)

The Committee have also been informed that 8 to 10 per cent of the total DRDO budget is being spent on fundamental research. The Committee are not happy with the existing state of affairs of the utilization of fund for existing R&D activities in DRDO. The Committee feel that besides utilization of the budget allocated for R&D activities

in DRDO, there is an urgent need for an increase in the total budget for R&D activities so that new and basic research work in DRDO could adequately be funded and the country's dependency on other countries in critical and high technology is minimized, thus enabling the country to become self-reliant in Defence production. The Committee, as recommended in their earlier Ninth Report (14th Lok Sabha), again emphasised that Defence Public Sector Undertakings and Ordnance Factories should have their in-house R&D centres so that the need to approach DRDO for small upgradation could be avoided. The Committee also desire DRDO to facilitate DPSUs and ordnance factories to set up necessary infrastructure and technical know-how to establish and strengthen their R&D Centres in advisory capacity.

The Committee further desire that R&D budget should be at least 14 to 15% of the total defence budget of the country as more and more research and product development opportunities are likely to come India's way due to changed international scenario.

Reply of the Government

Currently DRDO is spending about 6% of the Defence Budget. There have been discussions regarding increasing this allocation for conduct of more and more R&D activities for the three Services. As per Defence Procurement Procedure (DPP)—2006, the indigenous development under "Make" category can now be directly allocated to industry either with the help of DRDO or independent of DRDO with direct funding from MoD. There are also discussions wherein R&D allocations at Ordnance Factories and DPSUs need also to be increased. DRDO would mainly concentrate on highly complex or strategically sensitive or on futuristic technological development or on creating state-of-the-art test and evaluation facilities.

The requirement to increase budget provision for DRDO will be taken up progressively based on these considerations.

Non-utilisation of the allotted grants in full, during 2004-05 and 2005-06 was largely due to the reduced requirements against certain CCS approved programmes and special schemes. Subsequently allotted funds were fully utilized in 2006-07.

Defence PSUs, like Bharat Dynamics Limited (BDL) has in-house Design and Engineering Division which carries out limited R&D activities. Hindustan Aeronautics Limited (HAL) has nine R&D centres for design, development and upgradation of military aircrafts, helicopters, small engines, etc. Mishra Dhatu Nigam (MIDHANI)

Limited and HAL have collaboration in R&D activities with DRDO laboratories. Bharat Earth Movers Limited (BEML) has established R&D centre and also liaised with DRDO for research and development work. Bharat Electronics Limited has two established R&D centres and is also closely working with several DRDO Laboratories.

Comments of the Committee

(Please *see* para 27 of Chapter-I)

Recommendation No. 5 (Para No. 5.24)

The Committee understand that designing and developing defence weapons is perhaps the toughest task for DRDO. There are shortage of designers and engineers in DRDO. The Committee, therefore, recommend that DRDO should search for the technology and product within the country before conducting research on a new product, as it would not only save precious time and energy of DRDO scientists but also save lots of money to the Government, besides ensuring quick availability of product to the Armed Forces.

Reply of the Government

Government is in agreement with the recommendations of the Standing Committee on Defence. DRDO undertakes development of only such technologies/products/applications, which are not available in the country.

Recommendation No. 5 (Para No. 5.25)

The Committee are given to understand among the three Services, only the Navy has design capability and it has due to this reason, the Navy is far ahead of the Army and Air Force in R&D and outsourcing, but they should have separate R&D of their own also. The Committee are confident after establishing their own R&D centres outsourcing will definitely increase. The Committee find it difficult to understand/ analyse that DRDO or the Ministry of Defence could not initiate section to establish a separate in-house R&D for each Army and Air Force. The Committee are of the view that Army and Air Force should also try hard to achieve the capability in design. The Committee note there is untapped source of large availability of technical manpower in the Army and its Base Workshops, which are designed to provide maintenance services, including repairing the defective equipment and machinery and undertaking preventive maintenance. The Committee,

therefore are of the view that the Ministry should explore the possibility of developing the base workshops as small research centres where talent of Engineers and technical staff could be utilized to modify the existing equipments and develop import-substitute products so that the precious time can be saved and this could lead to indigenization/ outsourcing.

They should help in laying down users requirements as they are very well versed with the equipments/machines. They are concerned with the functional operation of the equipment.

Reply of the Government

Navy has design capability only in the areas of ship-building and for other requirements they approach DRDO or industry.

The core competency of Army Base Workshops is to carry out mid-life overhaul of vehicles and equipment as a part of the Equipment Management Policy. While carrying out overhaul, manufacture of selected components, modification of existing assemblies/sub-assemblies as per requirement, reclamation and outsourcing are undertaken. It also involves limited R&D work. The responsibility of indigenisation of spare parts/stores for all imported equipment not manufactured by PSUs/OFBs have been transferred to EME from DGQA from 1 April 2007. This will also involve the technical staff of the Army Base Workshops in limited R&D.

The Indian Air Force is considering setting up of an indigenisation Base Repair Depot (BRD) with the aim of achieving self-reliance in indigenisation of spares.

Naval Headquarters have also been transferred the responsibility of indigenisation of spare parts/stores for all imported equipments since September 2005.

Recommendation No. 5 (Para No. 5.26)

The Committee note the problems faced by DRDO in the matter of non-availability of platform for trials of warheads for the navy, as the ships go on exercises. The Committee feel that a better coordination between DRDO and navy could easily solve this bottleneck and also cut short the time frame in development and testing of weapon system. The Committee, therefore, feel that Ministry should make concerted efforts in this direction so that testing and trials platforms may not be a problem any more.

Reply of the Government

DRDO and Indian Navy have developed very-close working relationship over the years and the situation has improved very much.

DRDO has also undertaken building a test and evaluation ship to further reduce the time for development and testing.

Comments of the Committee

(Please *see* Para 31 of Chapter-I)

Recommendation No. 5 (Para No. 5.27)

The Committee note that surveillance equipments are being imported from Israel and other foreign countries. It shows dependency on other countries. Therefore, the Committee keeping in view the changed geo-political scenario suggest that the Ministry/BEL must have an MoU with the private companies who have expertise in the area, or transfer of technology to produce these equipments in the country by Public Private Partnership in order to have self-reliance in this field. The Committee appreciate the measures taken by BEL in in-house R&D of its products resulting in large scale indigenisation of manufactured items. The Committee advice that other DPSUs will also follow the same model in the field of internal R&D product indigenization. It would be worthwhile for DRDO to tie up with other premier research organizations of the country like ISRO which have good expertise in camera technology.

Reply of the Government

Historically, DRDO and ISRO have collaborated in many areas with positive outcome and will continue the same.

Many Defence PSUs have already entered Memorandum of Understandings (MoUs) under public-private partnership to achieve self-reliance in defence sector. Some other DPSUs have started efforts in the field of product indigenisation. DPSUs, like Mishra Dhatu Nigam (MIDHANI) Limited, Hindustan Aeronautics Limited (HAL) already have their R&D centres.

Recommendation No. 5 (Para No. 5.28)

The Committee also feel that the country is heavily dependent on imported weapon systems for its armed forces which are some times

disproportionately procured from a single country/vendor, which affects the budget. With changing geo-political scenario, the Committee feel that it will be prudent to take strategically firm steps towards ensuring greater production of weapons systems indigenously developed by DRDO/Defence Production Agencies and Indian private sector. The Committee are of the opinion that the Ministry of Defence should work out a firm and well planned scheme for providing viable economic incentives for manufacturing of indigenously developed products by the Defence PSUs, Ordnance Factories and Private Sector. For the success the Committee also desire that DRDO should closely co-operate with the universities and IITs in order to have skilled technical manpower and available infrastructure in furtherance of in-house R&D for Defence products. The Ministry of Defence should directly fund as per the requirement of the users to strengthen R&D in the private sector. The reason is that the fundamental research in sensitive areas in highly capital intensive.

Reply of the Government

The Government in principle is in agreement with recommendations of the Committee. However, this requires closer examination in consultation with concerned departments/agencies.

DRDO has developed close ties with most of the universities and institutions across the country. DRDO has developed Centers of Excellence to encourage research in cutting edge technologies. Also, DRDO is working towards increasing its spending on Extramural Research from 1.5% of its annual budget to about 5%.

Defence Procurement Procedure (DPP)-2006 provides for MOD's directly funding R&D in private sector.

Recommendation No. 5 (Para No. 5.29)

The Committee feel that India should adopt model of R&D of developed countries like Russia, England, France, Germany and U.S., where any planned weapon system is developed concurrently by at least two private corporations and the U.S. Government pays them appropriate development cost. The products developed by those companies compete against each other and a production contract is signed with the successful company. The Committee desire that the Ministry should take steps for successful implementation of such a model, which not only provides private sector initiation participation in Defence R&D but also gives the country the latest and modern war gadgets.

Reply of the Government

The 'MAKE' procedure promulgated in Defence Procurement Procedure (DPP)-2006 provides for concurrent development by two competing vendors from the Indian private sector.

Recommendation No. 5 (Para No. 5.30)

The Committee understand that the country is spending huge amount of money to buy clothing for the use of Jawans in high altitude areas from foreign countries. Therefore, they recommend that DRDO should give more emphasis on design and production of clothing for our troops in high altitude areas, besides developing other weaponry. The Committee also feel that our military forces must be backed by an efficient industry either from foreign suppliers or from the indigenous industry. The Committee feel that there is a lot of scope for private sector participation in this area. The research done by DMRSDE Kanpur should be passed on to the industry which in turn can do mass production for the services as well as civil and export markets. Mass production would in turn reduce cost also.

Reply of the Government

Defence Material Science Research and Development Establishment (DMSRDE), a laboratory of DRDO at Kanpur, has been active laboratory in developing clothing items for use of Jawans in high altitude areas. With good expertise in design of clothing, it has current emphasis on development of new fibres and fabrics to impart improved performance quality to textile stores. The clothing technologies developed by DMSRDE, for several items accepted by the Users, have already been transferred to the industry. As such, the DMSRDE, has in focus to take up R&D of only such stores, which are generally not available in global market or are high-tech items.

Recommendation No. 5 (Para No. 5.31)

The Committee are given to understand that the ordnance factories do not have a system to prepare balance sheet in order to have an appraisal of their cost of products and materials etc. The Committee therefore, desired that Ordnance Factories should also prepare their balance sheet on the line of Corporate. Total accounting system of DPSUs should go as per standard accounting system of Indian Council of Chartered Accountant. The Committee are also of the view that in order to make ordnance factories, more progressive, productive,

competitive and financially viable, there is an urgent need to turn them into a Corporation and allow them to select vendors and to take decision in financial and R&D matters independently because in the competitive age they must have full autonomy in order to have level playing field.

Reply of the Government

It has been decided to introduce Commercial Accounting Format in Ordnance Factories. The finalized formats have been forwarded for concurrence of Comptroller and Auditor General. The Kelkar Committee (Part II) has recommended that the Ordnance Factories should be corporatized. This recommendation was examined and the Government has decided not to corporatize Ordinance Factories. It has also been decided that the present position would continue for some time.

In order to make Ordnance Factories more progressive, productive, competitive and financially viable, substantial financial power have been delegated by the Government to Ordnance Factories, including full power for R&D.

Comments of the Committee

(Please *see* para 34 of Chapter-I)

Recommendation No. 6 (Para No. 6.11)

The Committee note the difficulties being faced by the DRDO while interacting with the user. Some of these difficulties are changing of GSQR midstream, long and extended trials which results in final placement of orders after very long time. The Committee also note that an indigenously developed product is subject to prolonged exhaustive trials and evaluation, whereas imported products are not subjected to the same evaluation but are readily accepted, whereas performance of indigenously developed product are equally good as the imported one. The Committee, therefore, recommend that users should promote the indigenously developed defence items in preference to the imported ones and there should not be major changes in GSQRs. DRDO should also follow concurrent engineering for development of the products on a case-to-case basis according to the circumstances or even they can have outsourcing to avoid the embarrassment and delay in production at all level. From day one users and manufacturers should be involved from top policy making decision to all other level.

Reply of the Government

The Government in principle agrees with the observations of the Standing Committee. However, it is submitted that in addition to DRDO's own effort of keeping abreast with latest technologies, only such mutually agreed changes in GSQR be made which do not necessitate initiating a new cycle of development, or are substantial enough to put back the developmental effort by unduly long periods. In all situations, products based on DRDO developed technologies will have a reasonable useful User life. DRDO has adopted concurrent engineering for all the development projects. Representatives of User and production agencies are always members of Project Management Board.

Recommendation No. 6 (Para No. 6.12)

The Committee note that the involvement of the users with DRDO/ Private industry is very limited. Due to this, the final products lack the facilities and qualities as per technical and the requirement of the user. The Committee as recommended in their Ninth and Eleventh Reports of the Committee (14th Lok Sabha) further recommend that representative selected by the user, for a specific project should have adequate knowledge of the product to be produced and he must be involved at the conceptualization stage of the project on a permanent basis so that defects, if any may be rectified during production stage itself and delivery of the product to the user may not get delayed for a long time. In case, the user does not suggest corrective measures/ improvement whereas necessary and the product is not developed as per GSQR, then the accountability may also be fixed on them in this regard. The Committee also desire that there should be compulsory financial participation of the users in the projects so as to increase user involvement.

Reply of the Government

DRDO has taken up a case of financial stake holding of DRDO: Industry: User in the ratio 70:20:10 which is under consideration of the Government.

Recommendation No. 6 (Para No. 6.13)

For this purpose, the Committee recommend that the user should give its specification along with adequate project fund to DRDO for a system/product and the final or cut off date of development should be fixed by them. Manufacturers should also be taken into confidence

from the beginning for the success of the product. DRDO should create an environment more friendly with Indian Companies off loading their responsibilities. Usuall research should be given to manufacturers-Government or private as the case may be. DRDO must off load a number of their responsibilities. DRDO should not think that private industry are not capable worthy of maintaining secrecy, lacking in integrity. They should shed their doubts. It should have certain supervisory responsibilities to monitor all major product developments as part of the service under their care and accountability. The Committee also feel that, as in other developed nations, a project management organisation or coordination Committee with representations from DRDO, user and production agency should be there and the funds should be provided in different stages after ascertaining the performance according to the parameters set up and agreed upon. The Committee, therefore, strongly recommend that it is essential to make fundamental changes in the organization, structure, monitoring method and in the funding pattern of DRDO with accountability to the user and to do work in time.

The Committee feel that once it has been decided to hand over a project to DRDO for development and production, care should be taken to avoid last minute major changes in its design etc. and should invariable be inducted in the user service. While going in for any imports, it should be weighed as to what shall be the options available with the country in case of technology denial regime and in case of a war. Preference should always be given to indigenous development of technology.

Reply of the Government

DRDO has been regularly involving private sector for development of sub-systems and components. The response of private sector is quite encouraging and many private companies have successfully developed and produced the products in limited numbers to meet the requirements of conducting tests and trials. Wherever, infrastructure and expertise are available in private sector, they are approached for developmental work right in the beginning of the project. DRDO focuses on those systems, which are of critical nature or strategic importance. Each project is considered by the Acquisition Wing of the MoD to decide as per Defence Procurement Procedure (DPP)-2006, whether it should be done by the DRDO or by the private sector.

Independent Review Committee, under the Chairmanship of Dr. P. Rama Rao, is studying the issue of restructuring of DRDO and project monitoring and review process.

Recommendation No. 7 (Para No. 7.4)

The Committee are of the view that before sanctioning of the project, at the formulation level itself, the Ministry with their users should have foreseen all the constraints scrupulously well in advance and all the techno, qualitative, design and development requirements of the project could have been completed. The Committee are of the view that had the Ministry followed the concurrent engineering and development approach, the number of closed projects might have come down and infructuous efforts and expenditure made thereon could have been avoided. The project which has been overtaken by technical development elsewhere and not worth the extra efforts should be undertaken by DRDO. The Committee, therefore, desire that there should be scientific, technical and concurrent audit of the ongoing project from an outside agency so that the kinds of situation that have come to the notice of the Committee do not recur. The Committee also desire that the Ministry should study the reasons, have a second look and take the advice of an expert before closing down of any project in future so that the country may not be deprived of the intended benefits of the project envisaged.

Reply of the Government

A Peer Review, with the members drawn from various industries, universities, academia, finance, users other R&D institutions and DRDO is conducted before getting Government approval. Concurrent engineering practice is being followed in every project. Quality Assurance and Production Agency are now being identified right from the beginning of the project. The suggestions by the Standing Committee on Defence regarding closure of the project will be implemented.

Recommendation No. 8 (Para No. 8.21)

The Committee note that scores of projects with DRDO were plagued by time and cost overruns and several projects were short closed due to change in the GSQR by the user or due to technological obsolescence. Some of the projects are showing significant time and cost overrun. The Committee are of the view that the delays in development of weapon systems, MBT Arjun, LCA II, Samvahak, Samyukta, Sangraha, Integrated Guide Missile Development Programme *i.e.* Prithvi, Akash, Trishul, Nag and Agni, Kaveri Engine for LCA etc. not only has caused significant loss of revenue but also delayed the timely procurement of weapon systems from foreign sources that were

needed to keep the forces fighting fit and modernised. The delays cause suspicion on the capability of DRDO in the eyes of the users, the common man and intelligentsia. The Committee do understand that not every equipment can be developed by DRDO. The Committee, however, desire that prior to taking a decision on the development of a weapon system, DRDO should sharpen its foresight, whether it could develop it within a fixed time frame and with available financial and technical resources or not.

Reply of the Government

Main Battle Tank (MBT) Arjun, Light Combat Aircraft (LCA) Tejas, Integrated Guided Missile Development Programme (IGMDP), etc. are major systems developments, attempted for the very first time not only in DRDO, but also in the country. When projects, like MBT were taken up in early 80s, Indian Industry was just not ready to embark on these types of products and DRDO decided to initiate development including major components/sub-systems in-house. Subsequently, Missile Technology Control Regime (MTCR) and technology denial by Western block delayed these developments still further.

Industry is now in a much better position for taking up development, production and integration. Situation has also changed drastically with liberalization and globalization in late 90s and early 2000. There is no shortcut to the learning in developing ones own products, but the pains undergone in the development, should instill the confidence in future capabilities and strengths for newer developments as every agency would have learnt its lessons and also gained in maturity in technology leadership and decision taking, in a realistic manner. It is equally important that both public-private sectors pay adequate attention to investment in research and development in an increasingly competitive environment.

Hopefully, these measures would make development time and cost more manageable.

Recommendation No. 8 (Para No. 8.22)

The Committee feel that DRDO should lay more stress on the Project Management as in the Western industrialized countries, where the R&D agencies only design and develop armaments technologies and the military, as the user agency, has the highest stakes in such weapon development projects, because it contributes directly to their operational capabilities.

Reply of the Government

Modern project management practices have been used for all the projects undertaken after 1980. DRDO only undertakes the design and development of the systems till Transfer of Technology (ToT) stage and thereafter the production agencies take over. DRDO has also suggested management contributions from all its stake holders, namely Users and production agency.

Recommendation No. 8 (Para No. 8.22a)

The Committee are of the opinion that DRDO being the prime development agency for almost all type of research, cannot absolve itself from the responsibility for inordinate delay in the important project like LCA and Kaveri Engine and also of creating credible deterrence capabilities for Indian Armed Forces by developing technologically superior weapon systems. The Committee keeping in view of the fact that weapon system face obsolescence very fast, desire that DRDO must concentrate and focus on augmenting basic science and technological output to be at par with the other developed countries. The Committee also desire that DRDO should enter into joint venture/collaboration with Indian Private Industry or the foreign partner where it does not have capability to design and develop. The Committee also desire that Ministry must ensure to minimize the gap between the project initiated and sanctioned.

Reply of the Government

DRDO Team continues to upgrade the inducted systems to take care of technological obsolescence.

DRDO has started entering into joint venture/collaborations with foreign partners for joint development projects after the liberalization and globalization. Such collaborative development has become possible now when many countries have recognized strength of DRDO in development and testing. Such collaborative projects will have shorter development time (for example, Brahmos).

Recommendation No. 9 (Para No. 8.23)

The Committee are perturbed to note that the Government of India accorded clearance for the development of an indigenous Main Battle Tank (MBT) Arjun in May 1974. Even after the lapse of more than 32 years, the nominated agency of DRDO could not execute the mission so far. Inordinate delay has escalated the original cost of MBT project

from Rs. 15.50 crore in 1974 to Rs. 306 crore in 2005. The Committee are surprised to note that neither the execution agency of DRDO or the certifying agency Director General Quality Assurance (DGQA) are taking responsibility for the inordinate delay and quantity in production of MBT Arjun. Out of 124 ordered for tanks by the users, only 15 tanks have been produced by the Heavy Vehicle Factory, Avadi.

Reply of the Government

The development of Main Battle Tank was started in Aug. 1972 as per GSQR 326 at a cost of Rs. 15.50 crore. The GSQR was revised a number of times and the final GSQR 467 for MBT Arjun was issued in Nov. 1985 incorporating a number of technological and operational changes. The total cost of the project was revised to Rs. 280.00 crore and the project finally was closed in March 1995 with a total expenditure of Rs. 305.60 crore with delivery of 12 nos. of prototypes and 15 nos. of Pre-Production Series of Arjun tanks. These tanks underwent extensive field evaluation with the Army wherein approximately 70,000 km. of mobility trials and 7000 rounds of main armament were fired. The equipment was approved by Army and an indent of 124 nos. of MBT Arjun was placed on Heavy Vehicle Factory/ Ordnance Factory Board (OFB) in March 2000. DRDO, in association with DGQA and OFB, is fully involved in streamlining the bulk production and early delivery of tanks to Army. All quality assurance issues have been duly addressed and production is taking place as per the production schedule finalized during the meeting of 5th Steering Committee on Production of MBT Arjun.

Recommendation No. 9 (Para No. 8.25)

From the foregoing the Committee are very much concerned and strongly feel that over the last 40 years, DRDO has put efforts on R&D and also in manufacturing but still it has not been capable of mastering the technology to fulfil the goal of self-reliance designing and developing their own MBT Arjun. It has not been able to deliver the goals of self-reliance as promised by it to the nation. It seems that DRDO can deliver successful results only when it enters into joint venture/collaboration with a reliable partner.

Reply of the Government

Over the last 40 years, DRDO has developed and delivered many technologically complex products like Prithvi, Agni, Lakshya, EW Systems, Radars, Sonars, Torpedo, NBC Systems, etc.

It has taken longer time than initially predicted for complex systems, which were taken up in early 80s due to limitations of industry, constraints from foreign suppliers and technology problems being attempted for the first type by DRDO.

The present trend of entering into collaborative R&D wherever, feasible will cut down development time and risks.

Recommendation No. 9 (Para No. 8.26)

The Ministry of Defence should think seriously as to how to comply Arjun's requirement in a time bound manner with the help of private Industry—joint venture ship or otherwise.

Reply of the Government

Steering Committee chaired by Secretary (Defence Production) is reviewing the progress on production of Arjun tanks. The present order for 124 MBT Arjun will be completed by HVF by 2009 and a large number of private industries are supplying sub-systems for integration by HVF.

This Committee is empowered to recommend alternate production agencies or joint ventures if users requirements (including beyond 124) in terms of delivery schedules are not likely to be met by HVF.

Recommendation No. 9 (Para No. 8.27)

The Committee, therefore, stress that DRDO must concentrate on augmenting in technological output to be ahead with the other developed countries and in order to put India on the world map capable of mastering the technology.

Reply of the Government

Government agrees with the recommendation of the Standing Committee on Defence. DRDO's efforts are directed towards this broad goal. But it will be difficult for DRDO to develop the entire spectrum of products required by the Services. Indian industries and PSUs must take equal responsibility in meeting with the challenges. Defence Procurement Procedure (DPP)—2006 has some enabling provisions in this regard.

Recommendation No. 10 (Para No. 8.40)

The Committee also express their displeasure in the delay in development of LCA (rechristened as Tejas) which started in 1983,

which is still showing time and cost overruns. The Committee note that even after 530 flight tests the LCA is years away from induction into IAF. The Committee also note that contract between IAF and HAL has been signed for initial induction of 20 Tejas aircraft into operational service. However, it could not be turned into reality so far due to delay in development of indigenous Kaveri Engine.

Reply of the Government

For first 20 Tejas production aircraft will be fitted with imported GE engines. Production is in progress at HAL. The issue of Kaveri Engine has been delinked from Tejas production and will surface again only after the Kaveri Engine undergoes all mandatory development tests. Thus initial lots of Tejas production aircraft will feature G.E. Engine.

Recommendation No. 10 (Para No. 8.41)

The Committee note the inordinate delay in the development of indigenous Kaveri engine to meet the LCA requirement. The project on design and development of Kaveri Engine was originally sanctioned way back in 1989 to Gas Turbine Research Estt. (GTRE) at a cost of Rs. 382.81 crore with PDC in December, 1996. However, after spending 15 years, it has revised the PDC to Dec. 09 with an approximate budget of Rs. 2839 crore. The Committee also note that now DRDO is adopting concurrent engineering and joint venture approach in order to develop the Kaveri Engine. The Committee deprecate the delayed approach of DRDO to enter into joint venture with other company or Defence Public Sector Undertakings for development of this engine. Had it taken this decision earlier, till now the LCA would have become a reality with Kaveri engine and the inordinate delay and huge escalation in the revised cost could have been minimized. The Committee, therefore, recommend that the Ministry should take immediate steps to avoid further delay in the development of Kaveri Engine and time bound schedule for completion of this project may be fixed.

Reply of the Government

Gas Turbine Engine development for fighter aircraft is an extremely complex and involved exercise. Very few nations have this capability. Even for recent projects abroad, *e.g.* Euro Fighter, now engine development is not being attempted. In spite of complexities and challenges, DRDO has initiated this development, *ab initio*, from scratch and established necessary skills and infrastructure to establish indigenous engine development capability.

To accelerate the Kaveri Engine progress, DRDO has initiated action to select a reputed engine house as a partner in development and production. Request for Proposal (RFP) has already been sent to engine houses. The contract is likely to be finalized before the end of 2007, if techno-commercial terms are found acceptable. It is estimated that the production release of such engine can be expected by the end of 2011.

Recommendation No. 10 (Para No. 8.42)

The Committee note that non-development of the engine and the long list of slip-ups in domestic production programmes has strengthened the need for a thorough assessment of the functioning of both the Defence Research & Development Organisation and the production agencies. The Committee also desire that Ministry of Defence and DRDO should address these problems seriously and take firm steps for development of Kaveri Engine for LCA by giving full autonomy to Aeronautic Development Agency (ADA) or by entering into collaboration/joint venture with the public private limited company which is favourable to avoid further loss with foreign partner without further loss of time.

Reply of the Government

Gas Turbine Engine development for fighter aircraft is an extremely complex and involved exercise. Very few nations have this capability. Even for recent projects abroad, e.g. Euro Fighter, new engine development is not being attempted. In spite of complexities and challenges, DRDO has initiated this development, *ab-initio*, from scratch and established necessary skills and infrastructure to establish indigenous engine development capability.

To accelerate the Kaveri Engine progress, DRDO has initiated process to select a reputed engine house as a partner in development and production. Request for proposal (RFP) has already been sent to engine houses. The contract is likely to be finalized before the end of 2007, if techno-commercial terms are found acceptable. It is estimated that the production release of such engine can be expected by the end of 2011.

Aeronautical Developmental Agency (ADA) is an independent society with Programme Director as its Chief Executive and HAL is also independent DPSU totally independent from DRDO.

Recommendation No. 10 (Para No. 8.43)

Finally, the Committee are of the view that HAL and ADA may be allowed to develop their own leadership and separate organisation/ institution/company independent of DRDO.

Reply of the Government

HAL is a Defence PSU totally independent from DRDO. ADA is a society under Department of Defence R&D. Since substantial work for LCA is being carried out at DRDO laboratories, common leadership of Director General, DRDO functioning as DG, ADA will synergise the development efforts of ADA with DRDO. This arrangement has been discussed several times in the past and is found to be the most pragmatic way of managing the requisite technical and techno-managerial issues/tasks.

Recommendation No. 11 (Para No. 8.55)

The Committee note that integrated guided missile development programme (IGMDP) was sanctioned in 1983 to develop four missile systems, namely, Prithvi, Akash, Trishul and Nag in addition to the technology demonstrator—Agni. The Committee are constrained to note that the original cost of the project was Rs. 388.83 crore which has been now revised substantially and their probable date of completion which was 1995 has also been revised to 2007. The reasons furnished to the Committee for delay were—non-realization of state-of-art technology and non-availability of components and sub-systems. However, the Committee hope that DRDO will make all out efforts to overcome all the obstacles coming in the way of developing and completing these projects. The Committee again stress that DRDO must concentrate on fundamental R&D work and retain and augment its scientific knowledge based industry and simultaneously enter into joint venture with a capable company and also follow concurrent engineering approach where industry is a major partner from the early stage of R&D and product development. The Committee also note DRDO has well-established procedure for Limited Series Production (LSP) where Indian companies are fully associated in various stages of product development. The Committee feel that the Ministry should give more emphasis on concurrent engineering in the R&D and product development, as the DRDO has adopted concurrent engineering approach only during the development of the project. The Committee hope that in future most of R&D projects would not get delayed and the country would get the benefits of the projects in time.

Reply of the Government

Missile Complex laboratories, are in general, following the recommendations as suggested by Standing Committee. The concurrent engineering model has been adopted and followed in IGMDP and also other missile systems under development.

Recommendation No. 11 (Para No. 8.57)

The Committee appreciate the Joint Venture model of Brahmos signed between India and Russia in 1998 which has resulted a technology collaboration between two leading research organizations of Russia, DRDO from India and NPO Mashinostroyenia. The Committee feel that this remarkable achievement in technology collaboration between two countries putting together their core competencies has given the message that DRDO can develop and lead to production of defence equipment in time satisfying the requirements of the Armed Forces, with less cost, if they resort to collaborative efforts in the form of Joint Ventures. Brahmos is a model joint venture, which needs to be followed by the Ministry of Defence to achieve competitiveness in the world arms market.

Reply of the Government

DRDO will enter in Joint Venture, wherever needed and feasible.

Recommendation No. 12 (Para No. 9.7)

The Committee are concerned to learn about the growing incidents of violence, suicide and killings by the overstressed Jawans particularly in J&K and North East. The Committee understand that human resource is not the job of DRDO, therefore, to manage the highly stressed environment, the Committee, desire that the Ministry of Defence should assigned this job to specialised association/bodies/ organizations who have expertise in this area, and these organisations may be allowed to use the facilities created by DRDO. The Committee also urge the Government to implement at the earliest the recommendation of this Committee on Armed Forces Tribunal Bill, 2005 which in the opinion of the Committee would definitely help to reduce the stress among the Jawans and Officers of the Armed Forces.

Reply of the Government

Defence Institute of Psychological Research (DIPR), a life sciences laboratory of DRDO, is the only laboratory in the country working on military psychology. This Laboratory has more than 50 years of experience in the area of stress management of the Armed Forces. Over the years, this Institute has developed competency and created

facilities, like stress management modules & manuals customized to the Armed Forces requirements. Though DIPR is not in a position to work towards all the aspects of human resources issues in Armed Forces in entirely due to limited scientific manpower, the expertise available is being used to coordinate such activities through other external agencies, involving Ministry of Defence.

Recommendation No. 13 (Para No. 10.21)

The Committee note that DRDO develops weapons and equipment in response to the Qualitative Requirements (QRs) projected by Services based on their threat perceptions. However, at times, the QRs are formulated by incorporating/selecting the 'best features' of various systems available in the world, at that point of time. Many times, it is not possible to include these 'best features' in a single system, which are sometimes conflicting due to technology-compatibility problems. The reasons for this vary. These are changes in threat perception, consequent strategy and tactics, advancing technology and introduction of new weapon systems, force the Services to make changes in the QRs, mid way in the project work etc. This necessitates redesign and redevelopment of some of the key sub-systems, causing time and cost overruns. Another related factor is the unexpectedly long time taken in extensive and extended user trials, which consequently increases the development time.

Reply of the Government

While the Government in principle is in agreement with the recommendations of the Committee, it may be clarified that QRs are provided by Users based on operational requirements of Users. Sometimes these are changed due to changed technical scenario when better technologies or items reportedly become available during long gestation period involved in development process. All efforts are made to complete these trials in shortest possible period. However, in development stage a series of repeated trials become necessary when defects are noticed and items after removal of defects are again subjected to trials.

Recommendation No. 13 (Para No. 10.22)

Though an endeavour is made by the Government to harness nation's best available expertise and infrastructure, this effort has proved to be inadequate in many cases. Moreover, indigenous industrial capacity does not exist for critical micro/nano electronic components and super components and advanced materials essential for

development of a world-class weapon system, whereas, these inputs are available off-the-shelf in most of the advanced countries. Non-availability of critical components, delay in supply or additional time taken in indigenous development of such inputs, is another cause of "time-over-runs" in many state-of-the-art systems.

Reply of the Government

Though Government is in agreement with this observation of the Committee, it may be mentioned that in respect certain critical components and sub-systems, special indigenous development effort has been made successfully.

Recommendation No. 13 (Para No. 10.23)

The Committee, therefore, feel that it is high time to create an environment where both public and private sector grow together and the R&D effort should be synergized and coordinated in a big way to obtain and absorb capital investment or high technology from international partner outside. The Committee also desire that Ministry of Defence should provide level playing field to Indian private industry and allow private industry to tie up with original manufacturers abroad to develop certain basic science and technologies based on requirements of the users as delay in production of indigenous defence items, extend benefits only to the foreign suppliers.

Reply of the Government

As per Defence Procurement Procedure (DPP)-2006, level playing field has been provided for private industry also to participate in R&D and subsequent productions.

Recommendation No. 13 (Para No. 10.24)

The Committee, therefore, recommend that DPSUs, Ordnance factories and private industry must work closely as a partner of each other and for the success of this DRDO should facilitate them. Even unexploited resources of IIT and its tech scientific universities knowledge based should be utilized to build-up defence capabilities. DRDO should allow these organisations to function independently if they so desire in collaboration with the user. For this purpose the Ministry, DPSUs and DRDO should sign bipartite and tripartite Memorandum of Understanding and enter into joint venture with Indian and International Partners in R&D and also in manufacturing to make use of already established industries in the world or basic components for designing and realization of hardware. The Committee also desire that DRDO should take initiative to provide greater role for IITs and Universities in the field of Defence R&D.

Reply of the Government

DRDO has entered into Memorandum of Understanding (MOU) with many universities including IITs and is funding many fundamental and applied research projects. There is network of DPSUs, OFs and private industries for all major defence systems both during prototype development and serial production.

Recommendation No. 13 (Para No. 10.25)

The Committee are also of the opinion that over the years the private sector has also graduated in capabilities and reach. Therefore, there is a need to emphasize on building an effective and fruitful public-private partnership in defence R&D and production on sharing basis. In order to ensure continued commitment, each stockholder should contribute to the funding in the ratio of 70:20:10 among DRDO, Industry and user respectively. In the case of development of products based on spin offs, the industry will be partner with DRDO by contributing funds in the ratio of 50:50 between DRDO and the Industry. The Committee, therefore, recommend that the Ministry of Defence should try to make provisions for direct funding of R&D activity in the industry, both public and private, apart from the provisions made for DRDO.

Reply of the Government

DRDO has already proposed joint stake holding model with shared funding in the ratio of 70:20:10 between DRDO: Industry Users.

Provision exists in Defence Procurement Procedure (DPP)-2006 for direct funding of R&D activity in industry, both public and private.

Recommendation No. 13 (Para No. 10.27)

The Committee note that the extent of investment made by the private industry as well as public sector in the R&D activity is very low and this has been a major factor restricting the country from acquiring sophisticated technology. Since R&D activities in defence requires heavy investments and the private sector does not have the capacity to invest, there must be a substantial Government support for making the industry technologically more capable. It is disheartening to note that while most advanced countries are spending at least two per cent of the GDP on basic science and technology in universities and research institutions and the industries both in public and private sector across the globe are investing between 4 and 15 per cent of their turnover towards R&D. The private industry in India today has developed very high capabilities in engineering and has a reasonable capability in design; but its contribution to R&D activities is very low.

Therefore, the Committee recommend that the Government must take initiative to encourage private sector to spend more on Defence R&D activities.

Reply of the Government

Government is in agreement with observation of the Committee. Provision exists in DPP-2006 to give incentive to R&D in both private and public sector.

Recommendation No. 13 (Para No. 10.28)

The Committee are of the view that to engage private industry, it would also be necessary to adopt the principle of acquiring minimum order quantity for technically and economically feasible viable proposals and it is also the responsibility of private sector to ensure quality as required by our defence.

Reply of the Government

The concept of ensuring a minimum order quantity has been incorporated in the 'MAKE' procedure for indigenous research, design, development and production of systems in DPP-2006.

Recommendation No. 13 (Para No. 10.29)

The Committee are of the considered views that long and continued dependence on imported weapon systems an lead to the country supporting all legal and illegal actions of the importing country as crucial supply of spares and ammunition could be in jeopardy in future. Therefore, the Committee strongly recommend that there should be greater professionalism in integrated defence capability planning, management of Research and Development and more emphasis should be given to self reliance, thereby nurturing the nation's industrial capability in defence sector.

Reply of the Government

Government is in agreement with the observations of the Committee. All efforts are made to promote self reliance in defence sector. The DPP-2006 has provisions to encourage indigenous R&D and products. The Offset policy is another margin step to achieve this objective.

CHAPTER III

RECOMMENDATIONS/OBSERVATIONS WHICH THE COMMITTEE DO NOT DESIRE TO PURSUE IN VIEW OF GOVERNMENT REPLIES

Recommendation No. 2 (Para No. 2.15)

The Committee note with serious concern that DRDO in addition to fundamental research and development for developing weapons and platforms for strategic requirement of Armed Forces is also undertaking R&D on medical sciences, life sciences and other allied sciences. The Committee strongly feel that R&D work on medical, life and other allied sciences should be entrusted directly to the concerned organization relating to these subjects as it would give more and more opportunity to DRDO to concentrate on the fundamental and crucial Defence Research work. This would make the country self reliant in the field of weapon systems and force multipliers. For R&D on Medical and allied sciences, Government should create a separate R&D organization in their respective organisation, life science and medical science can merge as respective institutions.

Reply of the Government

Life sciences laboratories are not engaged in fundamental research in the medical sciences but only carry out directed research in defence-critical products and technologies like, NBC, Bio-terrorism, problems related to high altitude stress, and augmentation of fresh/nutrition food for sustaining troops in field areas as required by the Indian defence forces. The limited activities in the life science areas are of direct use to the services and is highly appreciated by them.

Recommendation No. 2 (Para No. 2.16)

The Committee are of the view that DRDO should concentrate on research work, primarily on Defence and Strategically important matters only and research activities in the field of Life Sciences *i.e.* food, agriculture, medicine, psychology, physical and allied sciences, be left to the manufacturers or the users or private organizations as the case may be. The Committee also desire that projects for applied research activities should be funded by the respective Services/Organizations.

Reply of the Government

Main thrust of DRDO programmes are indigenous development of critical technologies/systems and strategic systems required for Indian defence. Applied research projects in areas, other than mentioned above, can be directly funded and controlled by respective Services. Provision for this has already been made in Defence Procurement Procedure (DPP)-2006. PSUs have been advised to have their own Research & Development centers for continued product improvements and new initiatives.

Recommendation No. 5 (Para No. 5.32)

The Committee are also given to understand that due to faulty production/certification of ammunition and incidents of fire, a large number of soldiers have died or been injured. The Committee, therefore, urge upon the Government to appoint a fact finding Committee to ensure to avoid recurrence of such incidents.

Reply of the Government

No data due to faulty ammunition/fire incident is held with AG's Branch. However, number of soldiers who have died or injured due to ammunition/splinter injuries/barrel blast/RL blast/grenade blast/range accidents peace time are as under:

Year	Killed	Wounded
2005	07	28
2006	07	38

Recommendation No. 7 (Para No. 7.3)

The Committee note with concern that DRDO closed the major projects namely Airborne Surveillance Platform Project, Cargo Ammunition, Technology Demonstration Programme, Development of 30 mm Fair Weather Towed AD Gun System and Light Towed AD Gun System, after getting these sanctioned and incurring huge expenditure thereon. The Committee are not fully convinced with the reply of the Ministry that due to technological constraints, change in design and development and GSQR, the Projects sanctioned were abandoned, particularly in the case of Cargo Ammunition where the project was closed when all the technological constraints were overcome and the design of 130 mm cargo shell, bomblet, fuze with SD element, packing system and ejection system were worked out.

Reply of the Government

In case of Cargo Ammunition, these were developed for 130 mm Cargo Ammunition as per the priorities laid down by the users. However, later on, user changed the priorities and wanted Cargo Ammunition for 120 mm Long Range Mortar as first priority. This required fresh development efforts. Due to this reason, the project was technically short closed. However, knowledge and expertise were used in development of new systems.

Recommendation No. 9 (Para No. 8.24)

Total requirement of Army is about 3500 Tanks. Army has placed an indent the manufacture 124 MBT Arjun and Arjun assembly has just started functioning. The Factory will produce 50 Arjun Tanks per year from the year 2009 onwards subject to continuous requirement of the user. Users should be empowered to certify the products by the ordinance factories. The Committee also like to be apprised how they will comply the demand of the user.

Reply of the Government

Present practice followed is that Authority Holding Seal Particulars (AHSP) remains with design agency till production stabilizes (about 5-10 lots). Thereafter, this responsibility is transferred to inspection agency (DGQA). Users do not carry out inspection/ acceptance of produce directly nor they have trained manpower and infrastructure at their disposal to carry out out this task.

DGQA has taken over the responsibility of QA and inspection of Arjun tanks from 1 April 2007. Products are always certified by manufacturers. Users have the right of inspections as customers either by themselves or through accredited agencies.

CHAPTER IV

RECOMMENDATIONS/OBSERVATIONS IN RESPECT OF WHICH REPLIES OF GOVERNMENT HAVE NOT BEEN ACCEPTED BY THE COMMITTEE

Recommendation No. 2 (Para No. 2.14)

The Committee express their displeasure to note that Scientific Advisor to Raksha Mantri has been assigned multifarious responsibilities. Besides this he was holding, the posts of Director-General of Defence Research and Development Organisation and Secretary (R&D). He is also the Director-General of Aeronautical Development Agency. The Committee strongly felt that any Officer who holds various posts simultaneously cannot be expected to devote adequate time and energy to visit R&D laboratories under him and to contact other scientific labs for motivational leadership purpose. This, in turn, dilutes the benefits of collective wisdom, different sets of mind sets give efficiency, accountability, proper planning and also efficacy of the organization. The Committee feel that one person should not be entrusted with a number of responsibilities by making him hold a number of posts simultaneously. The Committee also desire that the Government should fill all the vacancies urgently, so that the organization will be more purposeful and productive. The Committee would like to be apprised of the progress made by Government in this regard.

Reply of the Government

DRDO is administered through a collegiate management council headed by Secretary Defence Research and Development with all the Chief Controllers and Financial Advisor as members of the council. Each Chief Controller has functional autonomy with regard to the activities of the Laboratories in this cluster. This approach is necessitated both for specialization as well as management and the above said practice is working well over the past 15 years.

The Aeronautical Development Agency (ADA) is a society wholly funded by DRDO and has a Programme Director for LCA also functioning as Director ADA, with the clear delineation of financial and technical jurisdiction, akin to the Director of a DRDO Laboratory.

Nevertheless, the whole issue of management of DRDO and its associate setup is being looked into by Dr. P. Rama Rao Committee.

Comments of the Committee

(Please *see* Para 12 of Chapter-I)

Recommendation No. 3 (Para No. 3.5)

The Committee note with serious concern that the proposal to provide incentives for scientists of DRDO has been pending for consideration with the Government since 2001 and despite all the Parliamentary assurances, the Ministry has not taken any action to implement the proposed incentives. The Committee therefore, desire that immediate steps be taken by the Ministry to clear the said incentive proposal and also think of providing other perks and facilities in order to attract best, talented employable technical manpower and to contain the existing brain drain to further strengthen the organization so that the research work should not suffer.

Reply of the Government

A comprehensive proposal has already been submitted by the DRDO and is under active consideration by the Government. Comprehensive proposal has also been submitted to Sixth Central Pay Commission.

Comments of the Committee

(Please *see*Para 18 of Chaper-I)

Recommendation No. 3 (Para No. 3.6)

The Committee hold a view that scientists are the Intellectual property of the country and their contribution to the nation was peerless which could not be equated by providing only monetary benefits to them. The Committee, therefore, strongly recommended the Government to take suitable and firm measures for encouragement to scientists by providing adequate freedom to do research work. The Government should create an atmosphere of trust and have close interaction with them to address their problems/grievances so that they could concentrate on their research work.

Reply of the Government

DRDO has been provided with some level of flexibility in functioning within the Government system. A conducive ambience is being provided in work place as well as in Residential Quarters/ Campus.

The approach to tackle the serious problem of attrition is multi-pronged. A comprehensive proposal has been submitted to the Sixth Central Pay Commission and also being taken up separately with the Cabinet Committee for providing incentives to the scientists.

Comments of the Committee

(Please *see*Para 18 of Chapter-I)

CHAPTER V

RECOMMENDATIONS/OBSERVATIONS IN RESPECT OF WHICH FINAL REPLIES OF GOVERNMENT ARE STILL AWAITED

Recommendation No. 1 (Para No. 1.14)

The Committee, keeping in view the future war scenario, strongly feel that it has become imperative to develop weapon systems not only on one-to-one basis but also as an integrated system. The Government should, therefore, take a holistic and flexible view towards Defence R&D and production agencies by providing them complete autonomy and accountability and re-orient their work according to the changes taking place world wide.

Reply of the Government

Independent Review Committee under the Chairmanship of Dr. P. Rama Rao is looking into the issue of accountability of DRDO *vis-a-vis* autonomy in decision taking.

Recommendation No. 5 (Para No. 5.33)

The Committee further note that DRDO has instituted several review mechanisms to monitor programmes and projects: like: DRDO Research Council, multilevel programme management boards, inter-ministerial apex board and project peer review etc. However, the Committee find that inspite of so many review mechanisms, a large number of projects get delayed leading to time and cost overruns. The Committee, therefore, feel that there is an urgent need to review the working of various scientific review mechanism themselves as they themselves may be the cause of delays in some cases. The Committee feel that review mechanism should have technical personnel which can really guide the research projects on technical matters. There can be staffed by senior scientists from different research educational organisations who have experience in the relevant fields. Even the retired scientists from ISRO and Atomic Energy Commission etc. can also be associated with the review Committees. The Committee feel that there is an urgent need to appoint R&D Council of DRDO from CSIR etc.

Reply of the Government

Independent Review Committee, under the Chairmanship of Dr. P. Rama Rao, is looking into reasons and remedies for time and cost overrun of projects. Experts from different institutions/ organizations and universities and even retired scientists participate in various reviews of DRDO projects.

Defence R&D Board has been reconstituted including members from ISRO and CSIR.

Recommendation No. 11 (Para No. 8.56)

The Committee note that there is no scientific audit at any point of time of DRDO and its projects as such. However, the DRDO has the mechanism of feasibility study, design and technology evaluation, project peer review, post project review. The Committee observe that inspite of that, a large number of projects are showing inordinate delay and escalation of huge cost. The Committee, therefore, recommend that in addition to existing audit system, DRDO's projects must also be audited by external and independent audit group of experts duly approved by the Government of India. The Committee are of the view that this will facilitate the Government to understand the scientific environment, fundamentals in delays and to check the real growing cost and their over runs of the projects and contains the accountability of the DRDO and Ministry of Defence.

Reply of the Government

Independent Review Committee is considering this aspect also and is likely to give suitable recommendations.

Recommendation No. 13 (Para No. 10.26)

The Committee also endorse their views with the CII that inspite of the fact that DRDO interacts with more than 400 companies, there is no formally published framework/guidelines for partnership between the private sector and DRDO The Committee, therefore, recommend that Ministry of Defence must stipulate/publicise guidelines for industry participation in Defence R&D in order to attract more Indian Private Companies. These guidelines should be flexible and change progressively as per the need of the hour.

Reply of the Government

DRDO has constituted a Committee to stipulate guidelines for industry participation. After obtaining Government approval, the same will be published/implemented.

Recommendation No. 13 (Para No. 10.30)

The Ministry of Defence should take into confidence all highly performing scientific institutions in the country including DRDO, the future projections and requirement of the armed forces. It will help the Research Organisations and industry to plan their investment in research and infrastructure. Looking to the new and the changing warfare systems, some scientific organisations can work out how to reduce manpower and the marketing can take place. Till now we are working in conventional warfare. There is a need to make big shift in policy from conventional to strategic weapon system, from manufacturing to marketing and all nuclear and biological protecting environment. This will only happen after the strengthening of research organisations through appropriate investment, full autonomy and research should be decentralized. So, specialized laboratories should be established in the public private partnership. The Committee are fully aware of the budgetary constraints. With the limited sources how the capability of man and machinery can be efficiently used by developing basic science, fundamental technology or by analyzing the fundamentals.

Reply of the Government

Independent Review Committee is looking at DRDO's organizational structure and efficient use of manpower and machinery.

N EW D ELHI;
10 *March,* 2008
20 *Phalguna,* 1929 *(Saka)*

BALASAHEB VIKHE PATIL,
Chairman,
Standing Committee on Defence.

ANNEXURE 'A'
(Please *see*Para 16)

REVISED PROPOSAL OF INCENTIVES PACKAGE
(AFTER STUDY OF ASCI) SUBMITTED TO RM

- Special Intellectual capital pay @ 30% of basic pay under FR 9(25) to all Scientists.
- Three increments at the time of initial recruitment to Scientists at all levels.
- Enhancement of the present incentive of two increments given to Sc 'C' to 'F' to three increments which is to be treated as part of pay for all purposes including pension.
- T reating Special Pay of Rs. 2000 p.m. give to Scientists in the pay scale of Rs. 18400-22400 as part of pay for all purposes.
- Internet access and telephone reimbursement at the rate of Rs. 1000 to non-entitled Scientists.
- Enhancement of professional update allowance from Rs. 5000 to Rs. 25000 p.a.
- Higher qualification allowance of Rs. 1000 per month to all Scientists having post graduate qualification in Engg./Ph.D. in Science subjects.
- One time grant of Rs. 40,000 for purchase of lap top.
- Special Compensatory allowance for additional higher responsibility under FR 9(25) @ Rs. 5000 p.m. to Programme Directors/Directors of the Labs & Estts./Corporate Directors, @ Rs. 10,000 per month of Distinguished/Outstanding Scientists, Chief Controllers and @ Rs. 20,000 per month to SA to RM.
- Sanction to Air Travel for all the Scientists on temporary duty and for trials irrespective of basic pay including initial reporting to recruited post.
- Field trial allowance of Rs. 500 per day in addition to DA admissible at the stations.
- Hard Station posting allowance @ Rs. 3000 p.m. or ration and facilities as applicable to Armed Forces Officers posted at these stations.
- P romotion from Sc 'B' to 'C' after two years on completion of probation without assessment.

- Performance linked advance increments.
- Special leave to Scientists in the first two years of service for compassionate reasons, for appearing in examinations etc.
- Risk coverage and additional allowance @10% of basic pay for performing hazardous/arduous operations and special insurance cover for such activities.
- Comprehensive health cover for Scientists and their families.
- Sanction for sharing of royalty, monies/fees earned due to commercialization of intellectual property, patents, copyrights, designs etc. as per CSIR pattern.
- Sanction for introducing a reward scheme for Scientists for systems inducted in services @1% value of production order to be shared by the Scientists and associates of the labs.
- One time reward of Rs. 10,000 for papers published in journals of repute having an impact value of three and for patents approved with the ceiling of rupees one lakh per year at par with CHS Doctors.
- Permitting Scientists to attend international conferences once in two years with financial assistance of rupees one lakh per case.
- Enhancement of period of study leave to 36 months and a total absence of 48 months in combination with other admissible leave due.
- Grant of sabbatical leave for a maximum period of 24 months in two spells at an interval of 10 years.
- Permission to hold adjunct appointment for a period not exceeding a total time of one month in a year.
- Permission to take up individual consultancy for Scientists who have rendered 20 years service, not exceeding one month in a year and accept honorarium/fee thereof.
- Enhancement of retirement age by two years *i.e.* upto 62 years for all Scientists and 65 years for selective few.
- VRS for Scientists who have completed 20 years of service to facilitate migration to industries and to generate committed defence production.
- Contract appointment for experts for a period of 2 to 5 years with emoluments worked out as cost to company as in private sector.

ANNEXURE 'B'
(Please *see*Para 16)

RECOMMENDATION SUBMITTED TO 6TH CENTRAL PAY COMMISSION ON 11 JANUARY 2007

1. Proposed pay scales as per Govt. norms with 3 increments (instead of 2) at every stage to be treated as part of pay for all purposes including pension.
2. Intellectual capital pay @30% of basic pay.
3. Two increments presently given to Scientists in the grade of Sc. 'C' to Sc. 'F' and Rs. 2000 special pay given to Scientists 'G' in the pay scale of Rs. 18400-22400 in lieu of separate higher scale to be immediately declared as part of pay for DA and Pension made applicable all serving and retired Scientists.
4. Three increments uniformly to all Scientists from Scientist 'C' to Scientist 'H'.
5. Internet Access to all Scientists and reimbursement of Telephone/Internet expenses of the rate of Rs. 1000 p.m. to Scientist who are presently not covered.
6. Enhancement of professional update allowance from Rs. 5000 p.a. to Rs. 25000 p.a.
7. Higher qualification allowance of Rs. 1000 p.m. to Scientist having higher qualification M. Tech./Ph.D. at entry level.
8. Laptop grant of Rs. 40,000 to all Scientists.
9. Hazard allowance @15% of basic pay under FR 9 (25) to Scientists posted in such duties.
10. Special compensatory allowance for additional higher responsibility under FR 25@ Rs. 5000 p.m. to Directors, Rs. 10,000 p.m. to Chief Controllers/Outstanding/ Distinguished Scientists and Rs. 20,000 p.m. to SA to RM and Secretary Defence (R&D).
11. Air move on all duties to Scientists.
12. Field trial allowance of Rs. 500 per day during the trials conducted at remote places on Ships/Helicopter/Submarine etc. in addition to normal DA.

13. Remote area allowance of Rs. 3000 p.m. or free rations and facilities as applicable to service officers posted there.

14. Sharing of royalty of commercialized products on the lines of CSIR.

15. Reward for systems introduced in the services 11% of production value.

16. As an incentive to promote innovation, one time reward of Rs. 10,000 for patents approved and paper published in Referred Journals.

17. Financial assistance of Rs. 1 lakh for attending International Conference once in 2 years.

18. Sabbatical leave of two years in two spells for Scientists who have completed 10 years of service.

19. Enhancement of Study Leave from 24 months to 36 months and extension by 12 months more with combination of other kind of leave.

20. Living allowance of Rs. 3000 when detailed for course of study beyond 180 days.

21. Permission to hold adjunct appointment for scientists having completed 20 years service not exceeding one month in a year and accept honorarium/fee thereof.

22. Medical insurance in addition to CGHS. Life insurance for Scientist/Staff during hazardous trials.

23. Enhancement of age of superannuation to 62 years and selectively to 65 years for experts.

24. VRS (with golden Handshake) for scientists who have completed 20 years service to facilitate migration to industries and to generate committed Defence production.

25. Contractual appointment for experts proposed for Technical, Administration & Allied Categories.

APPENDIX I

MINUTES OF THE TENTH SITTING OF THE STANDING COMMITTEE ON DEFENCE (2007-2008)

The Committee sat on Tuesday, the 11th December 2007 from 1100 to 1240 hrs. in Committee Room 'C', Parliament House Annexe, New Delhi.

PRESENT

Shri Balasaheb Vikhe Patil— *Chairman*

MEMBERS

Lok Sabha

2. Shri Vijay Bahuguna
3. Shri Santosh Gangwar
4. Dr. K.S. Manoj
5. Shri Manavendra Singh
6. Shri Rajesh Verma
7. Shri Anil Shukla Warsi

Rajya Sabha

8. Shri Jai Parkash Aggarwal
9. Shri S.P.M. Syed Khan

SECRETARIAT

1. Shri Gopal Singh — *Director*
2. Shri D.R. Shekhar — *Deputy Secretary-II*

WITNESSES

Ministry of Defence

1. Shri Vijay Singh — Defence Secretary
2. Shri P.K. Rastogi — Addl. Secy. (R)
3. Shri Ajoya Acharya — Addl. Secy. (DP)
4. Smt. Neelkamal Narang — FA (DS)
5. Shri S.N. Misra — JS (HAL)
6. Shri V. Somasundaran — JS (OF)

DRDO

7.	Shri M. Natarajan	—	SA to RM
8.	Dr. D. Banerjee	—	CCR&D (AMS) & DS
9.	Dr. Prahlada	—	CCR&D (SI)
10.	Dr. W. Selvamuthy	—	CCR&DD (LS&HR)
11.	Shri N. Sita Ram	—	CCR&D (ECS)
12.	Shri G. Elangovan	—	CCR&D (R&M)
13.	Shri R.B. Singh	—	Director, (P&C)
14.	Shri J.P. Singh	—	Addl. Dir. (P&C)

Armed Forces HQ

15.	Air Mshl. B.N. Gokhale	—	VCAS
16.	V. Adml. Nirmal Verma	—	VCNS
17.	V. Admi. B.S. Randhawa	—	COM
18.	Air Mshl. A.V. Vaidya	—	DCIDS (PP&FD)
19.	Air Mshl. NAK Browne	—	DCAS
20.	AVM KJ Mathews	—	ACAS (Ops.)
21.	R. Adml. Anil Chopra	—	ACNS (P&P)

2. At the outset, the Chairman drew the attention of the representatives of the Ministry of Defence to the Direction 58 of the Directions by the Speaker, Lok Sabha regarding maintaining confidentiality of the deliberations of the sitting. The Chairman expressed his displeasure on the Action Taken Replies furnished by the Ministry as in most of the recommendations, the Ministry instead of giving proper reply, has referred to constitution of a Independent Review Committee under the Chairmanship of Dr. P. Rama Rao to examine the issue and report thereon. Hence, replies furnished by the Ministry were inadequate and incomprehensive. The Committee, therefore, desired the Ministry to brief on Action Taken replies furnished by the Ministry of Defence on recommendations/observations of the Committee contained in their 14th Report on Defence Research and Development Organisation (DRDO).

3. The Committee sought clarifications on several issues *viz*. achieving self-reliance through national effort by Ministry of Defence, Defence Public Sector Undertakings, ordnance Factories, Private Industries and DRDO, contributions of DRDO in achieving self-reliance, comprehensive proposal to provide incentives to the scientists of DRDO,

and its latest position, specific steps taken by the Ministry/DRDO to form a comprehensive national Policy to recruit and retain talented and experienced scientists, **highlights of DPP-2006** in R and D field, with special emphasis on 'MAKE' procedure, performance and outcome of Public Private Partnership under 'Make' category, etc.

4. During the interaction with the Ministry, the Committee also expressed their concern over the slow progress in production of Arjun Tank and development of Kaveri Engine and Light Combat Aircraft (LCA).

5. The Committee also desired to have a copy of the rpeort where more autonomous functioning of DRDO's laboratories was studied by DIPR, break up of the 6 percent budget being spent by the DRDO on R and D and possibility to make HAL, an independent body to develop LCA, etc.

6. The representatives of the Ministry clarified the issues raised by the Members one by one. On some of the issues the Committee desired to have written replies from the Ministry.

7. The Committee also desired to have a separate discussion on Tanks and Aircraft available and proposed to be procured for the Armed Forces.

8. The copy of verbatim record of the proceedings has been kept.

The Committee then adjourned.

MINUTES OF THE TWENTIETH SITTING OF THE STANDING COMMITTEE ON DEFENCE (2007-2008)

The Committee sat on Monday, the 10th March, 2008 from 1500 hrs. to 1545 hrs. in Committee Room 'C', Parliament House Annexe, New Delhi.

PRESENT

Shri Balasaheb Vikhe Patil — *Chairman*

MEMBERS

Lok Sabha

2. Shri Vijay Bahuguna
3. Shri Milind Murli Deora
4. Shri Jigajinagi Ramesh Chandappa
5. Shri C. Kuppusami
6. Dr. K.S. Manoj
7. Shri Asaduddin Owaisi
8. Shri Shrinivas Patil
9. Shri Arjun Charan Sethi
10. Shri Anil Shukla Warsi

Rajya Sabha

11. Smt. N.P. Durga
12. Shri K.B. Shanappa
13. Smt. Viplove Thakur

SECRETARIAT

1. Shri A. Louis Martin — *Joint Secretary*
2. Shri Gopal Singh — *Director*
3. Shri D.R. Shekhar — *Deputy Secretary-II*
4. Smt. J.M. Sinha — *Under Secretary*

2. The Committee considered the following Action Taken Reports and adopted the same with some additions/modifications, as suggested by the members:

(i) Draft Action Taken Report on the recommendations/ observations contained in the Fourteenth Report on 'Defence Research and Development Organisation (DRDO)'; and

(ii) ** ** ** **

3. The Committee then authorized the Chairman to finalize the above mentioned reports and present the same to the Parliament.

The Committee then adjourned.

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*Not related to the subject.

APPENDIX II

ANALYSIS OF THE ACTION TAKEN BY THE GOVERNMENT ON THE RECOMMENDATIONS/OBSERVATIONS CONTAINED IN THE 14TH REPORT OF THE STANDING COMMITTEE ON DEFENCE (FOURTEENTH LOK SABHA) ON 'DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)'

			Percentage of Total
(i)	Total number of recommendations	55	
(ii)	Recommendations/observations, which have been accepted by the Government: (Para Nos. 1.11, 1.12, 1.13, 2.17, 3.4, 3.7, 4.5, 4.6, 5.24, 5.25, 5.26, 5.27, 5.28, 5.29, 5.30, 5.31, 6.11, 6.12, 6.13, 7.4, 8.21, 8.22, 822a, 8.23, 8.25, 8.26, 8.27, 8.40 to 8.43, 8.55, 8.57, 9.7, 10.21 to 10.25, 10.27 to 10.29)	42	76%
(iii)	Recommendations/observations which the Committee do not desire to pursue in view of the Government's replies: (Para Nos. 2.15, 2.16, 5.32, 7.3, 8.24)	5	9%
(iv)	Recommendations/observations in respect of which replies of the Government have not been accepted by the Committee: (Para Nos. 2.14, 3.5, 3.6)	3	6%
(v)	Recommendations/observations in respect of which final replies of the Government are still awaited (Para Nos. 1.14, 5.33, 8.56, 10.26, 10.30)	5	9%