57

DESIGN AND DEVELOPMENT OF MAIN BATTLE TANK—ARJUN

MINISTRY OF DEFENCE

PUBLIC ACCOUNTS COMMITTEE

2003-2004

FIFTY-SEVENTH REPORT

THIRTEENTH LOK SABHA

LOK SABHA SECRETARIAT
NEW DELHI

FIFTY-SEVENTH REPORT

PUBLIC ACCOUNTS COMMITTEE (2003-04)

(THIRTEENTH LOK SABHA)

DESIGN AND DEVELOPMENT OF MAIN BATTLE TANK — ARJUN

MINISTRY OF DEFENCE

[*Action Taken on 5th Report of Public Accounts Committee (13th Lok Sabha)*]

Presented to Lok Sabha on 15.12.2003

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LOK SABHA SECRETARIAT

NEW DELHI

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CONTENTS

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(2003-04)

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** Shri Bhartruhari Mahtab, MP elected *w.e.f.* 30th July, 2003 *vice* Shri Chinmayanand Swami, MP ceased to be a Member on his appointment as Minister *w.e.f.* 24th May, 2003.
*** Shri C.P. Thirunavukkarasu, MP retired *w.e.f.* 6th October, 2003.

INTRODUCTION

I, the Chairman, Public Accounts Committee having been authorised by the Committee to present the Report on their behalf, do present this Fifty Seventh Report on action taken by Government on the recommendations of the Public Accounts Committee contained in their 5th Report (13th Lok Sabha) on "Design and Development of Main Battle Tank—Arjun."

2. This Report was considered and adopted by the Public Accounts Committee at their sitting held on 8th December, 2003. Minutes of the sitting form Part II of the Report.

3. For facility of reference and convenience, the recommendations of the Committee have been printed in thick type in the body of the Report and have also been reproduced in a consolidated form in Appendix to the Report.

4. The Committee place on record their appreciation of the assistance rendered to them in the matter by the Office of the Comptroller and Auditor General of India.

NEW DELHI;
11 *December*, 2003
20 *Agrahayana*, 1925 (*Saka*)

SARDAR BUTA SINGH,
Chairman,
Public Accounts Committee.

CHAPTER I

REPORT

This Report of the Committee deals with the action taken by Government on the observations/recommendations of the Committee contained in their Fifth Report (13th Lok Sabha) on Paragrapbh 26 & 29 of the Report of the Comptroller and Auditor General of India for the year ended 31 March 1997 (No. 7 of 1998), Union Government (Defence Services—Army & Ordnance Factories) relating to "Design and Development of Main Battle Tank—Arjun."

2. The Fifth Report which was presented to Lok Sabha on 27 April, 2000 contained 18 observations/recommendations. The Action Taken notes on all these observations/ recommendations have been received from the Ministry of Defence (Department of Defence Research and Development) and are broadly categorized as follows:—

(i) Recommendations and observations which have been accepted by the Government

Sl. Nos. 1, 4, 5, 7—9, 11—17

(ii) Recommendations and observations which the Committee do not desire to pursue in the light of replies received from Government.

Sl Nos. 2,3,6,10,18

(iii) Recommendations and observations replies to which have not been accepted by the Committee and which require reiteration

-Nil-

(iv) Recommendations and observations in respect of which the Government have furnished interim replies.

-Nil-

Findings of the Committee in their Original Report

3. The project for design and development of MBT-Arjun was launched in 1974 with the objective of eliminating dependence on foreign countries for design and manufacture of Armoured Fighting Vehicles and place the country on par with super powers with regard to quality of tanks and also to eliminate completely the outgo of foreign exchange in the production of tanks. The Committee in their 5th Report had observed that there were considerable delays at various stages of development and productionisation of the Main Battle Tank as against the envisaged targets. As per the latest revised estimates, Indian Army was to be equipped with the Main Battle Tank by the year 2007. The Committee, however, had expressed their serious apprehensions

about fulfillment of the target owing to the fact that procurement of a number of major systems like gun control system, fire control system, power-pack and transmission system was in the preliminary stage of negotiations. The Committee were further unhappy to find that the foreign exchange content in the project estimate had increased phenomenally from Rs. 3.70 crore in the original estimates sanctioned in May 1974 to Rs. 97.85 crore in the total expenditure of the project incurred till March 1995. Going by the indications given by the Ministry that the reduction in the import content from little under 60 per cent in prototype phase to under 45 per cent with the manufacture of first 300 tanks and under 30 per cent with the manufacture of about 500 tanks, the major objective of eliminating completely the outgo of foreign exchange in the production of tanks could not be achieved. The Committee had, therefore, recommended that sustained endeavour should be made by the Ministry to reduce the import content to the barest minimum in the production of MBT-Arjun. The Committee had also emphasized the need for commencement of bulk production of state-of-the-art MBT within the revised time schedule.

4. The action taken notes furnished by the Ministry of Defence have been reproduced in the relevant Chapters of this Report. In the succeeding paragraphs, the Committee, however, deal with the action taken by Government on some of their observations/recommendation.

Production of MBT-Arjun

Sl. Nos. 7,13,15 (Paragraphs 67,73 & 75)

5. As per originally envisaged plan, MBT Arjun was to be inducted into service during 1985-2000 in replacement of existing tanks. The Committee were however, concerned to observe that due to delay in production of MBT-Arjun, planned de-induction of obsolete Vijayanta tanks could not take place. As per the revised estimates, some regiments were planned to be equipped with MBT-Arjun by the year 2007. Emphasizing the need for early commencement of bulk production of the tank, the Committee had urged the Government to provide all essential wherewithal and stimulus to the concerned establishments and also to conduct constant and effective monitoring of production schedule so that the state-of-the-art Modern MBTs were made available to the country. One of the basis objectives of the project 'Arjun' was to completely eliminate the outgo of foreign exchange in the production of tanks. However, the Committee were constrained to find that the import content was near about 60% in the prototype phase and was expected to come down progressively with the manufacture of larger number of tanks. The Committee had desired that sustained endeavour should be made by the Ministry to reduce the import content to the barest minimum in the production of MBT-Arjun.

6. In their Action Taken notes the Ministry have *inter-alia* stated that the productionisation of MBT-Arjun has already been commenced with the release of an indent by the Army for the manufacture of 124 tanks. The first lot of tanks was expected to enter into service during the year 2003. The Ministry have added that every effort would be made to reduce the import content in the production of MBT-Arjun but the pace of indigenisation would be dictated by production volume. According to them, it

is also necessary to have orders on a continuing basis so that there are no breaks in production efforts to realize higher indigenous content.

7. In their earlier Report, the Committee had expressed serious reservations about the inordinate delay in the different phases of productionisation of MBT Arjun, which had frustrated the planned replacement of existing tanks. The Committee were informed that the first regiment was expected to be equipped with the Main Battle Tank from the year 2002 and two regiments were planned to be equipped by the year 2007 *i.e.* by the end of the 10th Plan. However, not a single tank has yet rolled out from Heavy Vehicles Factory (HVF). This, the Committee believe, will have serious adverse impact on the entire planning in respect of equipping our Army. The Committee therefore, desire that the Ministry should closely monitor the production schedule at HVF with a view to ensuring that the requisite number of tanks indented by the Army are made available to them within the stipulated time. The Committee also urge upon the Ministry to see that the infrastructural facilities created at HVF are utilized optimally so that the desired volume of production of MBTs is achieved which in turn will help in the progressive reduction of the import content. The Committee may be apprised of the progress made in the production of MBT-Arjun in due course.

CHAPTER II

RECOMMENDATIONS/OBSERVATIONS THAT HAVE BEEN ACCEPTED BY GOVERNMENT

Recommendations and Observations

Based on the General Staff Qualitative Requirement (GSQR) prepared by the Army in August 1972, the Government in May 1974 sanctioned the Project for design and development of MBT Arjun by Defence Research & Development Organisation (DRDO) at a total cost of Rs. 15.50 Crores involving a foreign exchange component of Rs. 3.70 Crores. The Committee note that the Project Arjun was launched with the laudable objective of eliminating dependence on foreign countries for design and manufacture of Armoured Fighting Vehicles and to place the country on a par with super powers with regard to quality of tanks and also to eliminate completely the outgo of foreign exchange in the production of tanks. The progress made towards the design and development of MBT was examined by the Public Accounts Committee (1988-89) and their findings reported in 5th Report (8th Lok Sabha) presented to Parliament on 28th April 1989. In the aforesaid Report, while expressing their serious concern over inordinate delay in design and dvelopment of MBT and steep escalation in the cost of the Project, the Committee had *inter-alia* recommended the Government to keep unremitting vigil on the progress of the project for its expeditious completion so that bulk production might commence at the earliest and also to ensure that the expenditure was contained within the sanctioned estimate of Rs. 280.90 crores. The Public Accounts Committee (1991-92) while reviewing the action taken by the Government in their 26th Report (10th Lok Sabha) presented to Parliament on 30 April 1992, were pained to observe that the time by which the bulk production of such an important weapon system would commence could not be anticipated with any degree of certainty. In the final action taken notes furnished to the Committee on the aforesaid Report, the Ministry intimated the Committee that all out efforts were being made to complete the development activities by 1995 but were non-committal to the time schedule for the commencement of bulk production of MBT Arjun. The facts brought out by the audit and examination by the present Committee also reveal further delays at various stages of the development and productionisation of the MBT.

[Sl.No. 1 Para 61 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action taken by the Ministry/Department

Army has released an indent for the manufacture of Qty. 124 Arjun Tanks (including 15 Limited Series Production) on Ordnance Factory Board in 30 March 2000 and the first tank is scheduled to be rolled out in the year 2002-03. The project closure report marking the completion of development activities by 31 March 1995 has been submitted and has since been approved by CCS. Government letter is under issue.

Audit Queries: Para 61-(I)

(I) The MBT project was closed on 31 March 1995 and the Ministry has now reported that project closure report marking completion of development activities by 31 March 1995 has been submitted, approved by the CCS and Govt. letter is under issue:—

(i) A copy of the said Govt. letter may be sent to PAC/Audit.

(ii) When was the closure report marking end of development activities submitted? What is the reason for 5 years delay in getting Govt. approval for the closure report?

Reply to Para 61 (I)

(i) A copy of the Govt. letter No. Vehs./57155/RD-156/401/S/D(R&D), dt. 06 Sep. 2000 is enclosed.

(ii) Draft Note seeking approval of CCPA and reporting completiton of development of MBT Arjun was initiated in Sep. 1993. This was kept pending till AHQs' approval was accorded for MBT Arjun. Immediately after the CCS accorded sanction for manufacture and induction of 2 regiments (124 Nos) of MBT Arjun, the Draft Note was revised and processed for *ex-post-facto* sanction for revision of cost. PDC and closure of Project MBT Arjun.

Additional Audit Queries: Para 61(I)-(ii)

It was indicated that approval of CCPA was kept pending till AHQ's approval was accorded for MBT Arjun. Date of AHQ's approval and reasons for 5 years' delay in getting Govt. approval for the closure report were not indicated, which may be clarified now;

Reply to Para 61(I)-(ii)

The draft note seeking approval of CCPA & reporting completion of development of MBT Arjun was initiated in Sep. 1993 and routed through Secy. (DP&S) in Apr. 94 in his capacity as Chairman of the Steering Committee for monitoring of the project. However, as already intimated it was kept pending and returned to us in July 1998 for updating the CCPA note after the AHQ had given clearance for the LSP tanks. Consequent to AHQ clearance in Jan. 98 for 15 LSP tanks and the Govt. approval accorded in Feb. 99 for the induction of two Regiments of MBT Arjun (124 Nos.) including 15 LSP, the draft note was amended. The amended draft note was then processed for *ex-post-facto*-sanction for revision of cost, PDC and closure of the project MBT Arjun.

Audit Queries: Para 61 (II)

Para 61(II)

The Cabinet Committee Note on the project initially indicated that the Project Arjun was launched with the laudable objective of eliminating dependence on foreign countries for design and manufacture of Armoured Fighting Vehicles and to place the

country on par with super powers with regard to quality of tanks and the eliminate completely the out go of foreign exchange in the production of tanks.

(i) Please indicate as to what extent the above objectives were achieved, so far?

(ii) The amount of outgo of foreign exchange incurred on the project may also be specified by Ministry.

Reply to Para 61 (II)

(i) The MBT Arjun was to be a product by indigenous design. This objective has been fully achieved in that it is entirely system configured by Indian engineers and scientists. It is pertinent to state here that in a product of MBT Arjun's complexity, even when the different sub-systems are configured/designed in India, they will have to necessarily feature some imported components. The percentage of imported components are dictated by absence of manufacturing infrastructure and the scales of economy. In our experience, typically in a mechanical system the import content will be of the order of min. 20% and in hydraulic, electronic and opto electronic systems the import content will be of the order of minimum 40%. This is due to infrastructure constraints in the country. The percentage of import content is therefore bound to be around 60% overall for the prototypes and for small volume production.

(ii) The expenditure incurred in foreign exchange under the MBT Arjun project is Rs. 97.85 crores.

[Ministry of Defence/Department of Defence Research & Development, OM No. DBFA/FA/83613/M/01, dated 04 March 2003]

Recommendations and Observations

What is further disquieting to note is that summer trials of 14 PPS tanks carried out between June 1993 and July 1996 revealed major deficiencies and failed to meet the requirement projected in the GSQR. The weapon system's performance was reportedly well below the acceptable level and the mission reliability of the tank was alarmingly low so much so that the tank was not acceptable to the User. Consequent to summer trails on PPS tanks in 1994, the Army Headquarters in consultation with DRDO laid down ten bottomline parameters/imperatives for acceptance of MBT. In the opinion of the Committee, persisting shortfalls in performance of tanks led to dilution of GSQR and laying down of ten imperatives. Significantly, despite carrying out modifications/ improvements in the 14 PPS tanks by DRDO, the User trails by Army in 1996 indicated that except in a few areas, the performance of PPS tanks fell far short of even the bottom line parameters/imperatives. Since the summer trials carried out in April 1997 on PPS 15 (reference tank for bulk production) also revealed that the major deficiencies pointed out in trials of 1996 still continued to persist, the Army reportedly indicated in July 1997 that in its present form, the overall reliability of MBT Arjun was far from satisfactory. The Ministry contended that in a product of MBT Arjun's complexity, despite best efforts for a good design in each of the sub-system, field tests brought out the need for improvement in certain areas, while validating the general design

feature. However, the inability to configure the tanks as per the satisfaction of the User despite dilution in the Original GSQR has a definite bearing on our indigenous research capability which, needless to reiterate, deserves to be given further fillip and stimulus.

[Sl. No. 4 Para 64 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action taken by the Ministry/Department

It should be appreciated that a major system like MBT Arjun was several high technology sophisticated assemblies will during the course of test and evaluation in field throw up some problems, that need to be attended to. This is the purpose of carrying out trials on PPS tanks. Sometime, the users too make some suggestions for modifications/improvements based on the actual trials. These are discussed with the users and action plan evolved for their incorporation. These all of such a nature, that are manageable for incorporation in regular production line.

Audit Query: Para 64

Ministry/DRDO had indicated that the problems encountered with MBT Arjun tanks all are of such a nature that are manageable for incorporation in regular production line:—

(i) In this context it may be mentioned that DRDO entered into a consultancy agreement in 1983 with a foreign firm to provide total cover in the field of design, development, evaluation and establishment of testing facilities at a cost of Rs. 89.50 lakhs. How far this consultancy helped the DRDO in the design and development of MBT.

(ii) Ministry/DRDO may please clarify as to how those changes/modifications could be incorporated when production facilities are established. It is pertinent to mention here that before commencement of production of PPS tanks, the CVRDE gave a similar assurance and went ahead with the production of PPS Tanks, Subsequent events, however, proved that the CVRDE was unable to keep the promises it made to the Army.

(iii) What are the voids that are to be given fillip and stimulus in the indigenous research capability to meet the ten imperatives laid down.

Reply to Para 64

Para 64 (i)

The consultancy referred herein with M/s Krauss Maffei, Germany. This consultancy had helped CVRDE to get an opportunity to understand their concepts relating to overall system configuration of German Leopard II tanks, considered to be one of the very good designs in tanks. This consultancy also helped to generate documentation on integration and evaluation of concept.

Para 64 (ii)

It is brought out that the most of the user observations and suggestions given in the Joint Action Plan have been incorporated in the PPS 15 tanks, the reference tanks cleared by the users. The amendments/modifications to the production drawings have also been carried out. The planning/procurement action for the productionisation of MBT Arjun is in progress in HVF, the production agency.

Para 64 (iii)

Nine out of ten imperatives have been met and the remaining one imperative, *i.e.* "All electric power traverse", being a new requirement will be pursued as a separate project.

[Ministry of Defence/Department of Defence Research & Development OM No. DBFA/FA/83613/M/01, dated 04 March 2003]

Recommendations and Observations

The Committee note that after discussion between Army and DRDO, a time bound joint Action Plan (JAP) was evolved in November, 1997 for implemention of the outstanding User observations/recommendations noticed during summer trials of 1997. According to the Ministry, the contentious issues like accurancy at battle ranges, quality of fire control system etc. too got deliberated as part of the discussion and those were illustrated through the ten imperatives laid down by Chief of the Army Staff (COAS) to be met for productionisation *vis-a-vis* the present status of MBT. Eight out of ten imperatives are stated to have been met so far. Out of the remaining two imperatives 'Accuracy at battle ranges' has been substantially achieved and is stated to be acceptable to user. As regards the imperative relating to ''All Electric Power Traverse'', the Ministry stated it to be a new requirement and was not linked with immediate production. According to them, this was to be pursued as a separate Project. Since Army kept on insisting that the tank fielded for them should not have any of the reservations expressed in the JAP, the Committee would like MoD to ensure that all such reservations of the Army are resolved.

[Sl. No. 5 Para 65 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action taken by the Ministry/Department

The present status of points pertaining to "Ten Imperatives" and "Joint Action Plan" is given below:—

Nine out of ten imperatives have been met and the remaining one imperative, *i.e.*, "All electric power traverse", being a new requirement will be pursued as a separate project.

Regarding Joint Action Plan points, except for three points, *i.e.* CPS demonstration, Smoke Grenade with anti-thermal property and Ammunition containerisation, all the

points were completed/cleared to the satisfaction of the users. The above three points are under various stages of development/manufacture and trails. These can be retrofitted and do not affect the productionisation of MBT Arjun.

Audit Query: Para 65

Ministry/DRDO had indicated in their Action Taken that out of the ten imperatives of the diluted GSQR, nine have been met remaining one imperative "All electric power traverse" will be pursued as a separate project. In addition to this, it had been mentioned that the three points of Joint Action Plan *viz.* CPS demonstration, Smoke Grenade with anti-thermal property and ammunition containerisation, etc. can be retrofitted and do not affect the productionisation of MBT Arjun.

In the context the following points need clarification:—

(i) What is the time frame laid down for 3 points of JAP may be indicated.

(ii) Also please intimate about the results of trails conducted for the three points mentioned in the Joint Action Plan, if completed, by now.

(iii) The point at issue is regarding cent percent satisfaction of the user/Army, about the minimum parameters set and about the reservations of the Army expressed in the Joint Action Plan. Action taken to achieve these objectives need to be elaborated.

Reply to Para 65

Para 65 (i)

The time frame for the balance 3 JAP points are given below:—

(a) CPS demonstration	—	The requisite perfromance demonstrated to the users during Oct. 2000.
(b) Smoke Grenade with anti thermal property	—	Demonstrated in Oct. 2000.
(c) Ammunition containerisation	—	Demonstration to users will be Carried out in Dec. 2000.

Para 65 (ii)

Please refer to answer to para 65 (i) above.

Para 65 (iii)

The pre production series tank No. 15 (PPS XV) has been cleared by the users, as the rerference tank for productionisation, through the process of implementing Joint Action Plan points.

[Ministry of Defence/Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01, dated 04 March 2003]

Recommendations and Observations

As per the latest estimates, some regiments are planned to be equipped with MBT Arjun by 2007. Subsequent to Cabinet approval, a technical negotiating Committee is stated to have been set up to negotiate with the concerned parties for procurement of some major systems like the gun control system, fire control system, power pack, transmissions system etc. Considering the fact that the time frame fixed for this Project has never been adhered to so far and particularly when negotiations for procurement of critical systems are yet to be taken up, the Committee have serious apprehensions about implementation of the time-schedule planned for bulk production of MBT Arjun. The need for early commencement of bulk production in the interest of defence preparedness of the country hardly need any reiteration. The Committee would like the Government to provide all essential wherewithal and stimulus to the concerned establishments and also to conduct constant and effective monitoring of production schedule so that adequate number of the state-of-the art modern MBTs, comparable to leading tanks to the World, become available to the country.

[Sl. No. 7 Para 67 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action taken by the Ministry/Department

Necessary steps as suggested by the Committee are being taken for effective monitoring of production schedule so that adequate number of the state-of-the-art MBT's become available.

Audit Query: Para 67

To avoid slippages in the production of State of the Art MBT and in order to maintain the delivery schedule what steps are being taken by MoD may be indicated.

Out of 124 MBTs inducted how may MBTs were of State of the Art MBT, may also be indicated.

Reply to Para 67

(i) A steering committee headed by Secy. (DP&S) with representation from AHQ, DRDO, DGQA and MOD will monitor the progress in bulk production of MBT Arjun. The Govt. has also approved the setting up an Addl. Director General of Combat Vehicles (ADGCV) in the AHQ to coordinate all activities relating to productionisation phase of MBT Arjun.

(ii) All the 124 MBT Arjuns will be of state-of-the-art tanks.

[Ministry of Defence/Department of Defence Research & Development OM No. DBFA/FA/83613/M/01, dated 04 March 2003]

Recommendations and Observations

The Committee wish to point out that Army's concurrence to the Production of tanks was conditional to the commitment made by DRDO that all the reservations

expressed by User in the JAP would be resolved. The Secretary, DRDO, during evidence informed the Committee that some of the improvements that could not be met in the prototypes would be met when production starts, that quality assurance would be progressive and that "throughout the world, nobody makes the tanks meeting all the specifications as per the requirements". The Committee desire that both DRDO and the Army through synergetic efforts should remove the technical or parametrical deficiencies which come up in the process of trials and provide the Nation an indigenous MBT of standing in comparison with the leading battle tanks of the world.

[Sl. No. 8, Para 68 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action Taken by the Ministry/Department

The users are fully involved in the implementation of "Joint Action Plan" evolved in 1997 between DRDO and Army for productionisation of MBT Arjun. A Substantial number of these improvements have already been demonstrated and cleared by the users. In this connection DRDO comments on para 65 also refer.

[Ministry of Defence/Department of Defence Research & Development OM No. DBFA/FA/83613/M/01, dated 04 March, 2003]

Recommendations and Observations

The Committee note that MBT Arjun was designed around an imported Fire Control System (FCS). The Army were reportedly of the view that the design of FCS was no longer responsive to any technical inputs and its performance was at its saturation level. The DRDO, however, contended that the FCS as incorported in MBT Arjun performed at par with contemporary world class MBTs. In view of the fast pace of advancement of technology, the Committee feel that there is inherent danger of obsolescence of the technology planned if such an enormous time is taken in the development of the MBT. The Committee would therefore like to be reassured that the tank finally fielded for Army, incorporates latest FCA. The Committee have been informed that efforts in the direction of indigenous production of FCS were under way and that the MBT would be progressively inducted after its successful trial evaluation. The Committee would like to be apprised of the progress made on this count.

[Sl. No. 9, Para 69 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action Taken by the Ministry/Department

The FCS as incorporated in MBT Arjun performs at par with contemporary world class MBTs. This is authenticated by the fact that we have consistently obtained the desired first round hit probability from a static tank on a static target even under harsh environmental conditions of Indian deserts and performance better than that stipulated in GSQR under dynamic modes of firing.

As a fall-back option, Lab prototype of Indigenous Gunner's Main Sight (IGMS) has been developed. The same was integrated in one of the PPS tanks. Firing trials

were conducted in association with users successfully during summer 1999. Two ruggedised models of IGMS are under manufacture at BEL, Chennai.

Audit Query: Para 69

Ministry may also please specify here as to whether the Indigenous Gunner's Main Sight (GMS) trial evaluated in Summer 1999 incorporated the "latest FCS", or not, to rule out danger of obsolescence of technology.

Reply to Para 69

In the Indigenous Gunner's Main Sight (IGMS) the latest FCS has been incorporated.

[Ministry of Defence/Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01, dated 04 March, 2003]

Recommendations and Observations

The Committee note with dismay the steep increase in the estimated cost of the Project for design and development of MBT-Arjun. The initial cost of the MBT Project which was estimated at Rs. 15.50 crore in 1974 was revised to Rs. 56.55 crore in 1980 and to Rs. 280.80 crore in 1987. The actual expenditure was, however, Rs. 307.48 crore in March 1995, despite the fact that there was a shortfall in the production of 10 prototypes/PPS tanks. Thus, there has been an escalation of cost by twenty times compared to the initial estimated cost of the product. The increase in the cost of the Project has been attributed to changes in GSQR, requirements of additional prototypes and PPS tanks, setting up of AFV Evaluation centre, more realistic assessment of technical and User trials, Exchange rate variation, general escalation etc. The Committee are of the opinion that the manner in which cost estimates of the Project have been revised from time to time is indicative of a tendency of getting projects sanctioned by under estimation of costs generally and also by omission of several essential requirements which could be later incorporated without much trouble because of their essentiality. While escalation in cost may partly be due to revisions in the GSQR and addition of certain new features, the Committee are inclined to believe that abnormal delay in design and development of MBT also contributed immensely towards escalation of cost. The Committee find that expenditure incurred by CVRDE on manpower for the years 1993-95 amounting to Rs. 12.78 crore was pending regularisation by the Ministry. They deprecate such unauthorised expenditure and recommend for its expeditious regularisation. The Committee urge upon the Ministry to ensure that the Project cost is not further inflated by any unauthorised expenditure and would like to know the quantum of expenditure actually spent till the formal closure of the Project on design and development of MBT Arjun.

[Sl. No. 11, Para 71 of Appendix to 5th Report of PAC
(13th Lok Sabha)]

Action Taken by the Ministry/Department

The expenditure in respect of manpower for the period 1993-1995 has been booked under the head "Wages & Salaries" of DRDO as the project did not have enough

funds. Now that the Government approval has been accorded for induction of 124 tanks, approval of CCS is being sought for formal closure of the project" Design and Development of MBT Arjun" with revised expenditure which will include the manpower expenditure for the years 1993-95.

The total expenditure at the closure of the project, including the expenditure on manpower for the years 1993-95 will be Rs. 305.60 Crores.

Audit Query: Para 71

Ministry may indicate steps taken to equip the MBT with latest sub-systems. The Ministry may indicate that abnormal delay in the design and development of MBT also contributed immensely towards escalation of cost and there is no scope for further escalation in cost of MBT Project.

Reply to Para 71

(i) The sub-system integrated in the MBT Arjun are the State-of-the-Art systems and its features and performance compares favourably with the currently available systems in the world class tanks.

(ii) The MBT Arjun project has been successfully completed and closed with the total expenditure including commitments of Rs. 305.60 Crores. The question of further escalation in cost does not arise.

Additional Audit Query: Para 71

(ii) Ministry may specifically indicate/admit here that abnormal delay in the design and development of MBT has indeed contributed towards escalation of cost, which has been proved already.

Reply to Para 71

(ii) The escalation in cost of the project may be partly due to delay in the design and development of MBT. This delay is mainly due to changes in GSQR, requirements of additional prototypes and PPS tanks, setting up of AFV Evaluation Centre, more realistic assessment of technical and users trials, exchange rate variation, general escalation etc.

[Ministry of Defence/Department of Defence Research & Development OM No. DBFA/FA/83613/M/01, dated 04 March, 2003]

Recommendations and Observations

The Committee observe that two supplementaryProjects costing Rs. 41.98 crore were sanctioned by the Ministry in September, 1995 and January, 1997 for product support and modifications to MBT Arjun with planned dates of completion as 31 March, 1996 and 30 September, 1999. In the opinion of the Committee, this would also result in under estimating the Project cost of MBT-Arjun to the extent of Rs. 41.98 crore. Since the Main Project of MBT-Arjun was still on, the contention of the Ministry that these two Projects were quite distinct and could not be linked to the original Main

Project appears untenable. The Committee would like to be apprised of the status of these Projects including the quantum of expenditure incurred so far in their implementation.

[Sl. No. 12, Para 72 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action Taken by the Ministry/Department

The two projects costing Rs. 41.98 Crores mentioned by the Committee are as follows:—

(a) Product support for user trials—Sanctioned cost Rs. 16.98 Crores.

(b) Improvements to systems MBT Arjun—Sanctioned cost Rs. 25.00 Crores.

The project at (a) above has been completed and the expenditure incurred under this project is Rs. 16.68 Crores.

The project at (b) above is an ongoing project and the PDC of the same is Sept., 2000. The total commitment made under this project as on 31 May, 2000 is Rs. 20.16 Crores.

Audit Query: Para 72

As the two supplementary projects are linked to the Original Main Project and the PDC of 'Improvements to systems MBT Arjun' will be over in September, 2000, the present status of that project and cost incurred as of date may please be furnished for appraisal. When these improved systems are likely to be integrated with MBT may also be indicated.

Reply to Para 72

A number of improvements are contemplated under the project "Improvements to Systems MBT Arjun". 70% of the improvements have been completed under this project and the balance 30% are under various stages of manufacture and testing. It is proposed to obtain PDC extension upto Sept. 2001 to complete the balance improvement activities. These improvements will be incorporated in the production vehicle in a phased manner. The expenditure including commitments on the project "Improvements to Systems MBT Arjun" as on Sept., 2000 is Rs. 2300.48 lakhs.

Audit Remarks: Para 72

Ministry indicated in their reply that it was proposed to obtain PDC extension upto September, 2001 to complete balance improvement activities on the project "Improvement to systems MBT Arjun." The latest status on this and the completion cost of the project may please be intimated to PAC/Audit.

Reply to Para 72

All the activities pertaining to the project "Improvements to systems MBT Arjun" have been completed and the project has been closed *w.e.f.* 30 June, 2002. The

expenditure incurred under this project is Rs. 2459.22 lakhs as against the sanctioned amount of Rs. 2500 lakhs.

[Ministry of Defence/Department of Defence Research & Development OM No. DBFA/FA/83613/M/01, dated 07 July, 2003]

Recommendations and Observations

Another disquieting aspect is that the foreign exchange content of the Project estimate has increased phenomenally from Rs. 3.70 crore in the estimate sanctioned in May 1974 to Rs. 97.87 crore in the total expenditure of the Project till March 1995. The Committee note that three major systems of the MBT Arjun *i.e.* Power Pack, Gun Conrol and Fire control systems are based on imported technology and as per the cost estimate made for 15 LSPs in December 1995, nearly 60 per cent of the total cost estimate related to imported supplies. The Ministry pleaded that in a product of MBT Arjun's complexity, even when the different sub-systems are configured/designed indigenously; they will have to feature necessarily some imported components, the percentage of which are dictated by absence of manufacturing infrastructure and the scales of economy. Disappointingly, the envisaged objective of developing MBT-Arjun entirely by indigenous effort, going by present indications, does not seem attainable. As regards future plan contemplated to reduce import content in the production of MBT, the Ministry hope to reduce the import content from little under 60% in prototype phase to under 45% with the manufacture of first 300 tanks and under 30% with the manufacture of about 500 tanks. The Committee trust that sustained endeavour would be made by Ministry in coming years to reduce the import content to the barest minimum in the production of MBT-Arjun.

[Sl. No. 13, Para 73 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action Taken by the Ministry/Department

The observation of the Committee has been noted. Every effort will be made to reduce the import content in the production of MBT Arjun. However the pace of indigenisation will be dictated by production volume. It is also necessary to have orders on a continuing basis, so that there are no breaks in production efforts to realise higher indigenous content.

Audit Query: Para 73

As per production schedule of MBT, HVF has to produce 30 MBTs per annum with effect from 2003-2004. The FE amount may be reduced to 45% with manufacture of first 300 tanks *i.e.*, by the 2011-2012 and under 30% with the manufacture of about 500 tanks *i.e.* by 2017-2018

To sustain continuity of production and also to reduce import content, what are the total requirement of MBT's during 9th and 10th Army Plans may be elaborated.

Reply to Para 73

Army has placed an indent on Ordnance factory Board for manufacture of 124 Arjun tanks during 9th & 10th Plan.

Additional Audit Query Para 73

Ministry/DRDO has only intimated about the indent placed on OFB for manufacture of 124 Arjun tanks and nothing has been indicated about how much total requirement of MBTs are expected beyond 9th and 10th Army plans to sustain continuity of production and to reduce import content? Specific reply to reduce import content and quantum of tanks required to sustain production may be furnished now.

Reply to Para 73

As already brought out the pace of indigenisation will be dictated by the production volume. DRDO endeavour would be to reduce import content from under 60% in prototype phase to under 45% with the manufacture of first 300 tanks & under 30% with the manufacture of about 500 tanks.

The requirement of MBT Arjun tanks beyond the 10th Plan is yet to be decided by the AHQ/MOD.

[Ministry of Defence/Department of Defence Research & Development OM NO. DBFA/FA/83613/M/01, dated 04 March, 2003]

Recommendations and Observations

The Committee are constrained to point out that even though 26 years elapsed since the sanction of the Project and the schedule for commercial production has already overshot the original by 16 years, the bulk production of MBT-Arjun is yet to commence. The various reasons adduced by the Ministry in this regard included, non-availability of power pack from import sources and inherent challenges in development of other technology intensive systems and modules, inadequate infrastructure for manufacture and testing, changes in GSQR etc. The Committee believe that in the case of a time taking developmental Project involving a fast developing technology, updating of requirements by the User from time to time is unavoidable to some extent and should have been aptly taken care of while planning the schedule of completion. However, such prudence on the part of the Ministry was conspicuous by its absence. In the hindsight, while the Ministry were well aware of the fact that it takes around 15 to 20 years for manufacture of an armour of MBT-Arjun class even by the industrially advanced countries, it is inconceivable that the Ministry initially set a target, hard to achieve without fully realising the technological complexities of MBT as well as the infrastructural inadequacies in our defence production units.

[Sl. No. 14, Para 74 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action Taken by the Ministry/Department

The productionisation of MBT Arjun has already been commenced with the release of an indent by the Army for the manufacture of 124 tanks. Regarding time frame for a project, in future, the time frame for any major project like MBT Arjun will be worked out taking into consideration all the aspects mentioned above.

Audit Query: 74

Ministry may elaborate here the action plan to avoid slippage's in the production schedule for MBT and how it is going to be monitored may be elaborated.

Comments/Clarifications on Para 74

Pleased refer answer to para 67 (i)

[Ministry of Defence/Department of Defence Research & Development
OM NO. DBFA/FA/83613/M/01
dated 04 March 2003]

Recommendations and Observations

As per envisaged plan, MBT-Arjun was to be inducted into service during 1985-2000 in replacement of existing tanks which were expected to be outdated beyond 1985. In this context, the Committee examined at some length the status of Vijayanta tanks in terms of their battle worthiness. The Committee have been informed that overhauling of Vijayanta tanks was being discontinued from the production year 1999-2000 onwards as a result of approved deinduction plan. Based on repeated evaluation of Vijayanta fleet which proved that these tanks were no more an operational asset, it has been decided by the Ministry to phased them out and hold the equipment only till replacements are available. Distressingly, complete phasing out could not be carried out as scheduled, due to slippages in production/procurement of T-72 tanks. The Main Battle Tank today is stated to be T-72 or Ajay which is supposed to replace the obsolete Vijayanta. Evidently, the delay in production of MBT-Arjun has created such a precarious situation where there is no option but to retain obsolete Vijayanta tanks. While expressing their grave concern over the prevailing situation, the Committee recommend that immediate and effective measures be taken by the Ministry to ensure that obsolete Vijayanta tanks are replaced expeditiously to strengthen our tank fleet.

[Sl. No. 15, Para 75 of Appendix to 5th Report of PAC
(13th Lok Sabha)]

Action Taken by the Ministry/Department

With the placement of indent for manufacture of 124 MBT Arjun tanks, the production planning process has been set into motion. The supply orders have been placed for most of the items. The first lot is stated to enter into service during the year 2003.

Audit Query: Para 75

(i) Ministry may clarify as to whether the obsolete Vijayanta tanks will have to remain till the year 2003 when the first lot of MBT Arjun is expected to enter into service. Please indicate phasing out of Vijayanta *vis-a-vis* replacement by MBT and likely replacement cost.

(ii) Please indicate any new Performance Evaluation Review Technique (PERT) Charts are evolved now by Ministry/R&D for such complex projects? If so, a copy of the same may please be made available of Committee as well as audit.

Reply to Para 75

(i) Depending on their vintage Vijayanta tanks have been categorised in four categories as follows:—

(a) Pre MKIA Tanks - Qty 485. Already declared obsolete.

(b) MK IA Tanks - Qty 504. Case for obsoletion being processed by MoD.

(c) MK IB Tanks - Qty 504 GSEPC has approved processing of case for declaring obsolete in Jan. 2001.

(d) MK IC Tanks - Qty 648 GSEPC has approved processing of case for declaring obsolescent in Jan. 2001.

The cost of MBT Arjun as on date is Rs. 14 Crores. It cannot be compared with that of an old vintage Vijayanta tank. Its operational and technology superiority *vis-a-vis* Vijayanta tank will have to be factored in any replacement philosophy to arrive at a meaningful analysis.

(ii) DRDO has not evolved any new PERT. The concept of PERT is universal.

[Ministry of Defence/Department of Defence Research & Development
OM NO. DBFA/FA/83613/M/01
dated 04 March, 2003]

Recommendations and Observations

The Committee are concerned that the balance of combat equation has been disturbed in recent times with the acqusition of T-80 tanks by our adversary. What adds to the anxiety of the Committee is the fact that Vijayanta tanks are in the process of being phased out while it would take a couple of years before MBT-Arjun is made available. The Committee were given to understand that there was a move to procure T-90 tanks in the interregnum. They would like to be apprised of the factual position about the import of tanks in question as also the safeguards being taken to ensure that indigenous R & D programme is not affected adversely. On the contrary efforts should be made to absorb latest technology and to build our R & D pool.

[Sl. No. 16, Para 76, of Appendix to 5th Report of PAC
(13th Lok Sabha)]

Action Taken by the Ministry/Department

The price negotiations are presently being held with Russia for acquisition of T-90 tanks to fill up the existing deficiencies of tanks. This is not connected with the manufacture of MBT Arjun, indent for which has already been placed.

Audit Query: Para 76

(i) Ministry may apprise the Committee about the outcome and present status of price negotiations held with Russia for acquisition of T-90 tanks.

(ii) What are the existing deficiencies (say in quantities/Nos.) of MBT tanks to meet the operational requirement.

(iii) Also please indicate whether any effort have been taken so far to absorb latest technology to build our R & D pool and what is the action plan for its implementation?

Reply to Audit Queries: Para 76

(i) Price Negotiation Committee (PNC) concluded the negotiation in last week of Sep. 2000. Consequent to which an Agreement was signed between MoD and RVZ. Russia which specified various costs in details. The PNC submitted its report in end Nov. 2000 to the MOD obtained approval of CCS Note from the Cabinet Committee on security in Feb. 2001. Contract for procurement has been concluded on 15th Feb. 2001.

(ii) The authorisation of tanks based on existing AC profile is 3717 tanks. Present holding of all tanks is approx. 2292. The existing deficiency is 1425 tanks.

(iii) Transfer to Technology (TOT) and Licence for Production has been negotiated for T-90S tank from Russia.

Additional Audit Query

(a) Para 75 (I) & 76 (ii)

Ministry has only indicated phasing out of Vijayanta Tanks but not its replacement by MBT-Arjun. This may be indicated taking into account deficiency of 1425 MBTs.

Ministry may please indicate under this para as to how the existing deficiencies of 1425 tanks are met with for operational requirements.

Reply to Para 75 & 76 (a) Para 754(I) & 76 (ii) The envisaged induction of MBT Arjun during 1985-2000 wad delayed due to slippages at the development and production stage. The tank is now likely to be inducted into service *w.e.f.* 2002-03. The operational requirements with respect to existing deficiencies of 1425 tanks are therefore being met by import of 310T-90 tanks and transfer of technology for manufacture of 1000 tanks at HVF Chennai. In order to absorb the latest technology and build our R &D pool indent, for quantity 124 MBT Arjun has been placed on HVF Avadi.

Audit Queries Para 75(I) and 76(ii)

Ministry had indicated in their reply that as the first lot of MBT Arjun is likely to be inducted into service from the year 2002-2003, the existing deficiencies on account

of phasing out of 1425 Vijayanta, are being met with by import of 310T-90 tanks and transfer of technology for manufacture of 1000 tanks at HVF Avadi, Chennai, etc. In this regards, Ministry may please furnish the following details:—

(i) As Ministry had indicated in Sept. 2000 that negotiations for acquisition of T-90 tanks were in Progress, the details on the dates of supply of 310T-90 tanks from Russia.

(ii) Progress on the manufacture of 1000 tanks at HVF Chennai, on transfer of technology, their dates of induction etc.

(iii) Ministry may please, specify here, about the "period of deriving the R&D benefit of the developmental project; which was sanctioned before 28 years. Ministry may also clarify to the PAC as to whether MBT Arjun being productionised would be the latest in technology in the world, as committed from time to time by Government.

2. Reply to Para 75(I) and 76 (ii)

(a) Details on Supply of 310 T-90 Tanks

Qty 124 FF T-90 tanks have already arrived and inducted into service. Induction of qty 186 SKD/CKDT-90 tanks into the service is as under:—

(i) Qty 86 SKD T-90Tanks	Commence by Nov. 2003 and completed by May 2004.
(ii) Qty 100 CKD T-90 Tanks	Commence by Oct. 2004 and completed by Jan. 2005.

(b) Manufacture of 1000 Tanks under TOT

The production of indigenous T-90 tanks under TOT will commence on completion of SKD/CKD tanks. Qty 50 T-90 tanks are likely to be inducted by 2006-07. Thereafter, HVF has an annual production capability of 120 tanks per year.

(c) Deriving R & D Benefit of Development Project

The benefits that have accrued through the medium of implementation of MBT Arjun programme are as under:—

- A team of well qualified, trained and experienced professionals comprising 300 engineers, 600 technical staff and 600 industrial employees has been generated, for any futuristic task.

- A reasonable proportion of the talent team is planned to be made available to the production agencies for TOT activities.

The extensive field experience acquired the field evaluation of MBT Arjun has produced for the first time in the country, enormous expertise in trial related activities that can be fully put to use in futuristic project.

The expertise gained has already paid a rich dividend, in that, the DRDO could bring out:—

- Combat Improved Ajeya featuring thermal imager, FCS and Armour improvement.
- Self Propelled 52 Calibre howitzer on modified Arjun Chassi named "BHIM"
- A high precision aircraft accessories gear box for LCA programme.

The MBT Arjun will be state-of-the art to the contemporary world class tanks.

[Ministry of Defence/Department of Defence Research & Development OM NO. DBFA/FA/83613/M/01, dated 04 March, 2003]

Recommendations and Observations

The Committee regret to point out that is a story of development Project, where R & D benefit has not been derived even after 26 years of its sanction. The Committee need hardly emphasise that the efficiency of any developmental Project can be judged only in terms of real and concrete achievement, which stil remains to be fulfilled in the present case. It would not be without basis therefore to conclude that the delay in development and productionisation of MBT Arjun was attributable, to a considerable extent, to deficient Project management and monitoring. Underlining the need to review the existing institutional mechanism for management and monitoring of the Project, the Committee remomend appointment of a high level Committee with the following objectives:

(i) To closely review and supervise the progress made towards bulk production of MBT-Arjun.

(ii) To ensure that MBT Arjun being productionised would be the most modern in the world as per the promise made by Government from time to time.

[Sl. No. 17, Para 77 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action Taken by the Ministry/Department

A Steering Committee headed by Secy. (DP&S) with representation from AHQ, DRDO, DGQA and MOD will monitor the progress in bulk production of MBT Arjun which will include quality in manufacture, continuous product update and progressive increased level of indigenous content. The Govt. has also approved the setting up an Additional Director General of Combat Vehicles (ADGCV) in the AHQ to coordinate all activities relating to productionisation phase of MBT Arjun and creation of the post of a Major General of head this Organisation. The office of ADGCV is fully functional for more than a year.

Audit Quety: Para 77

The benefits of projects as envisaged were:—

(i) to eliminated dependence on foreign countries for design and manufacture of armoured fighting vehicles.

(ii) placing the country on par with Super Powers in regard to quality of tanks.

(iii) complete elimination of requirements of Foreign exchange in production of the tanks on total indigenous design after developments of the engine.

It may be brought out that these benefits could not accrue due to deficient project management and monitoring.

Reply to Para 77

Para 77(i)

The system configuration of MBT Arjun has been done wholly in India by DRDO's Engineers and Scientists. Most of the technology intensive sub-systems have also been configured indigenously. However, due to inadequate design expertise in certain select areas and due to even greater constraints in manufacturing infrastructure/ expertise and also for reasons of scales of economy, some of the hardwares, though system configured in India have been sources from reputed vendors abroad in specialised areas to meet with out specifise needs. None of these hardwares are a direct transplant of an existing module in foreign tanks. The hardwares have been sourced largely from European sources, in view of design and technology similarities.

Para 77 (ii)

The MBT Arjun in the present configuration is way ahead of T series tanks and the Combat improved Ajeya. The Arjun tank can only be compared favourabily with similar state-of-art MBTs such as MI-A 1 Abrams of US, Leopard MK II of Germany and Challenger II of UK.

Para 77 (iii)

The MBT Arjun was to be a product by indigenous design. The objective has been fully achieved in that it is entirely system configured by Indian Engineers and Scientists. It is pertinent to state here that in a product of MBT Arjun's complexity, even when the different sub-systems are configured/designed in India, they will have to necessarily feature some imported components. The percentage of imported components are dictated by absence of manufacturing infrastructure and the scales of economy. In our experience, typically in a mechanical system the import content will be of the order of min. 20% and in hydraulic, electronic and opto electronic systems the import content will be of order of minimum 40%. This is due to infrastructure constraints in the country. The percentage of import content is therefore bound to be around 60% overall for the prototypes and for small volume production.

It may be appreciated that the effort in the design and development of MBT Arjun indigenously is first to system configure the product indigenously. The reduction in import content is a planned effort in the production programme. Given the augmented infrastrucutre facilities with the Ordinance Factories and PSUs and some select private sector plants in the recent times, we anticipate progressively increasing indigenous content. The pace of indigenisation will however be dictated by production volumes.

Addition Audit Query: Para 77 (iii) & Para 73

Earlier, Ministry indicated in their reply that the pace of indigenisation will however be dictated by production volumes and the requirement of MBT Arjun tanks beyond 10th plan is yet to be decided by AHQ/MOD etc. As both these factors are related, and having a bearing in reducing the import components of the project, the latest progress made/decision proposed to be taken etc. may please be elaborated to PAC.

Reply to Para 77 (iiii) & Para 73

There is no change in status regarding placement of further order beyond 124 numbers. As per the production schedule give by the HVF, the delivery of the 124 Arjun tanks is likely to be completed by 2008-2009. In the meanwhile action has been taken by DRDO to indigenise some of the systems like Gun Control System, Gunner's Main Sight, Tracks, Turret Drive Servo Coponents etc.

[Ministry of Defence /Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01
dated 04 March 2003]

CHAPTER III

RECOMMENDATIONS/OBSERVATIONS WHICH THE COMMITTEE DO NOT DESIRE TO PURSUE IN THE LIGHT OF THE REPLIES RECEIVED FROM GOVERNMENT

Recommendations/Observations

The Commtitee observe that the time framed fixed for the Project was never adhered to and was revised from time to time resulting in delays coupled with enjoined complications. This would be evident right from the stage of development of prototypes and pre production series (PPS) tanks. As per time frame fixed in May 1974, four mild steel prototypes were to be offered for trials by April 1980 and eight armoured prototypes by April. 1982. This time schedule was revised and as per commitment made in May 1987, 12 MK-I prototypes based on imported propulsion units, seven MK II prototypes with indigenous propulsion units were to deliverd by June 1987 and June 1990 respectively. 23 MK I PPS tanks were also to be produced by December 1988. As against this, 12 MK I prototypes with imported propulsion units were produced by February 1989 and 15 MK I PPS tanks upto December 1996 indicating delays of about two years and eight years respectively. The Committee have been informed that building of MK II prototypes had to be abandoned both due to incomplete development of indigenous engine and for the reasons of User's preference for water cooled 1400 hp Power Pack. The shortfall in production of PPS tanks was stated to be due to the usage of major systems as spares during User evaluation of 15 pre production tanks. Evidently, delay and shortfall in production of prototypes and PPS tanks was indicative of inadequacies in the Project planning right from the initial stage of the execution of the Project.

[S.No. 2, Pâra 62 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action Taken by the Ministry/Department

The MBT was to be designed around an imported powerpack. The non-availability of powerpack from import sources and inherent challenges in development of other technology intensive systems and modules, due to demanding design expertise and inadequate infrastructure for manufacture and testing resulted in delays in development. The changing threat assessment by Army in the intervening period led to changes in GSQR. This cascading effect coupled with a more rigorous field evaluation than originally envisaged led to delays in completion of development which were not entirely due to inadequacies in the project planning as observed by the committee.

Audit Query: Para 62

Inter-alia, it was brought out that delay in shortfall in production of prototypes and PPS tanks was indicative of inadequacies in Project Planning right from the initial stage of execution of the project.

It was stated that the reasons for delay in MBT development was that it was to be designed around an imported power pack. Actually it was decided in 1973 that the development work on the proposed MBT engine should be taken on priority basis to avoid foreign collaboration.

The benefits envisaged, *inter-alia*, on the MBT Project was complete elimination of requirement of the foreign exchange in production of tank on total indigenous design, after development of the engine. However, development efforts taken by DRDO for indigenous engine even after study of imported engines, not proved successful which led to delay in import of engines which in turn delayed completion of the tank prototypes.

The following aspects may be brought out:—

(i) Further development in the indigenous engine by DRDO

(ii) Major changes brought out in the GSQR

(iii) Rigorous field evaluation than originally envisaged

Reply to Para 62

(i) **Status of development in the indigenous engine**

The indigenously developed air-cooled engine produced power up to 900 hp on test bed. CVRDE could achieve the above engine power after availing limited consultancy from M/s AVL Austria. In the meanwhile, the users also gave their preference to stay put with the imported water cooled 1400 HP Power pack. Further work on the engine development was, therefore, kept in abeyance. However, the drawing for the manufacture of the redesigned V-90 indigenous engine are available for further development work.

It is brought out that the experience gained in the development of indigenous air cooled engine has immensely helped in carrying out substantial modifications on the MTU power pack of the MBT Arjun to meet the requirements of desert environment and high temperature, particularly to the cooling system and air cleaning system. In addition it has also helped in uprating the power out put of the V-46-6 engine of T 72 vehicle to 1000 hp which can be uprated up to 1200 hp, if necessary. This uprated engine has been test evaluated on the test bed to the required standard. The uprated T-72 engine (1000 hp has already been integrated in the T-72 Vehicle and being subjected to trial evaluation.

(ii) **Major changes brought out in the GSQR**

(a) High power to weight ratio

(b) Increased fire power armament (120mm gun)

(c) More lethal FSAPDS ammunition

(d) Independent line of sight stabilised day cum night (thermal) sight.

(e) State of the art Fire Control and Gun Control System.

(f) Improved armour protection (Kanchan Armour)

(iii) Rigorous field evaluation than originally envisaged

During the course of development, prototypes of the tanks have been tested rigorously upto 1992. On automotive side cumulative kilometerage covered by DRDO and users is more than 20000 Kms and as far as weapon system is concerned, about 3000 rounds have been fired to establish the performance of the tanks.

Similarly the pre-production series tanks have since undergone extensive field evaluation between the years 1993 and 1998. The pre-production tanks delivered to users during this period have together coverd 60000 kms of automotive trials and fired well ovedr 6000 rounds, averaging 4000 kms run per tank and more than 400 rounds fired from each tank, which is a good measure to conclude that the MBT Arun tanks have been evaluated rigorously than originally envisaged.

[Ministry of Defence /Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01
dated 04 March 2003]

Recommendations and Observations

The Committee's examination reveals that the User evaluation of prototypes and PPS tanks offered for trials by DRDO from time to time was beset with numerous problems. To begin with, the automotive system evaluation of two prototypes carried out till July 1989 by the Army revealed major deficiencies such as overheating of engine, excess weight, very low mission reliability etc. In the Steering Committee Meeting held on 26 July 1989, the Army reportedly expressed their reservation about commencement of production of PPS tanks on the ground that a fully intergrated tank was yet to be evaluated by them. Curiously enough, on 31 July 1989, the Ministry decided to place orders for six PPS tanks, two on Heavy Vehicle Factory and four on two Public Sector Undertakings. As the prototypes were not accepted by the user, the Committee wonder as to why the Government was in a tearing hurry to place orders of PPS tanks. Pertinently, automotive and weapon trials of two fully intergrated prototypes by the Army in March 1990 also revealed major deficiencies, thus validating their reservations expressed prior to commencement of production of PPS tanks. The Army accordingly indicated in the Steering Committee Meeting held on 24 August, 1990 that deficiences in areas like bogie wheels, suspension units, ammunition, fuel starvation etc. needed to be sorted out before PPS were taken up for manufacture. The Combat Vehicles Research & Development Establishment (CVRDE) then reportedly assured the Steering Committee that since orders for PPS tanks had already been placed all the deficiences pointed out by the User would be resolved and modifications incorporated in the six PPS tanks ordered. In this background of the matter, the committee would like to know the reasons which prompted Government to go ahead with production of PPS tanks without successful evaluation and acceptance of prototypes by the user.

[Sl. No. 3, Para 63 of Appendix to 5th Report of PAC
(13th Lok Sabha)

Action Taken by the Ministry/Department

For a complex system like MBT Arjun, long lead time is required for its production. a deliberate. A deliberate decision was therefore taken, in the review meeting held on 28.7.89 under the Charimanship of RM in which COAS and VCOAS were present, for concurrent test/evaluation and production of PPS tanks to cut down time. However, after every evaluation, the performance related issued got discussed in Arjun Executive Board headed by director General Combat Vehicles before proceeding with further action. Most of the deficiences were systematically attended to and improved upon by DRDO.

Audit Query: Para 63

Ministry had stated that a deliberate decision was taken in the review meeting held on 28.7.89 under the Chairmanship of RM where COAS, VCOAS were present, for concurrent test/evaluation and production of PPS tanks to cut down time. It was also indicated by Ministry/DRDO that most of the deficiencies were systematically attended to and improved upon. Actually the MBT development schedule given was not adhered to despite monitoring by agencies involved elucidate when the major deficiencies were attended to with date and improvement brought out by DRDO.

Reply to Para 63

Accuracy and reliability of weapon system and reliability of automotive system performance demonstrated to the users satisfactorily during the years 1995 and 1996.

Additional Audit Query: Para 63

The exact nature of deficiencies noticed and when they were attended to alongwith details of dates have not be furnished.

Reply to Para 63

Major deficiencies noticed by the users during the trials and the remedial measures taken are given below:—

Deficiencies	Remedial measures taken to overcome the deficiencies
1	2
(a) Overheating of Power pack	The power pack has been configured for the volume available in the Arjun tank and integrated with the vehicle. The performance was evaluated in the severe climatic conditions in deserts. Deficiency was noticed in the cooling system at the higher ambient temperature. Improvements carried out enhancing the flow rate of coolant & cooling air by increasing the flow area and introduction of guide vanes for smooth flow. With these improvements the overheating problem was overcome in the PPS tanks fielded in the year 1992.

1	2
(b) Fuel Starvation	Arjun vehicle fuel system was evaluated during the trials & fuel starvation was noticed. This has been rectified with the introduction of proper breathing mechanism and expansion tank with float assy, and enhanced capacity of the prefilter. In addition the complete fuel lines flow areas has been enhanced. These improvements have been carried out during 1991.
(c) Low Life of Dust extractor & Radiator fan blades.	The rotor of dust extractor found eroded during the trials. The errosion was minimised by changing the rotor material. Also to minimise the errosion of radiator & fan blade a wire mesh has been introduced. The above modifications were carried out during 1990. With this, the life dust extractor & radiator fan blades got impoved.
(d) Hydropneumatic Suspension (HSU)—Low Life	Improvement in cover seal and wheel hub both by design and by quality has been carried out. The hard chrome plating of cylinder, damper improvements and seal material improvements have been carried out in the year 1991 in PPS vehicles. These improvements helped in increasing the life of HSUs.
(e) Road wheels-Low	Since proper polymer technology was not available in the Life Rubber country, a decision was taken to rubberise limited number of road wheels from M/s Clouth, Germany in the year 1991. These wheels have given higher life in PPS vehicles. Simultaneously, an alternative indigenous source, namely M/s TVS Rubber had been approached to rubberise the wheels and the wheels supplied by the above are fitted in one of the PPS vehicle for evaluation.
(f) Inconsistency of FSAPDS ammunition	A special task force was constituted to study the trial results and effect remedies. The deficiencies and production related constraints identified by the task force have been analysed and improvements incorporated. The improvements were evaluated by conducting firing trials at Balasore in Dec. 90 and consistancy of dispersion was found within the accpetable limits.

[Ministry of Defence /Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01
dated 04 March 2003]

Recommendations and Observations

The Committee observe that since Army was not satisfied with the performance of PPS tanks 1 to 14, it was mutually decided between Army and DRDO in March 1996 that no design freez would be made before commencement of production till a fully integrated PPS 15 was made available and successfully evaluated by the Army. The Committee are perturbed to note that the Ministry in August 1996 sanctioned the manufacture of 15 number of LSP tanks by Ordnance Factory Board at an estimated cost of Rs. 162 crore without CCPA's approval and also decided to commence LSP work using PPS 12 as reference tank for bulk production in place of PPS 15. According to the Ministry, pending CCPA approval, a decision was taken to go ahead with the production of a limited number of 15 tanks in order to maintain continuity. This parallel action was sought to be taken to overcome the long lead time required for the planning for bulk production, technology transfer, floating of enquiries for procurement, training of manpower etc. However, as would be seen from the succeeding paragraph, most of the related activities for commencement of bulk production started only after obtaining the approval of Cabinet Commtitee on Security (CCS). Further, the decision to use PPS 12 in place of PPS 15 for commencement of bulk production was stated to have been based on the suggestion by DRDO that there was no change in the major systems between PPS 12 and PPS 15 and features to be additionally provided in PPS 15 could be added on after certification. Subsequently, with insistence from Army, PPS 15 was accepted to be the reference tank for manufacture of bulk production after its successful evaluation during 1997. Taking note of the fact that Army Headquarters gave clearance for manufacture of LSP in January 1998 and sanction for production of tanks was accorded by CCS only on 16 February 1999, the Committee are inclined to conclude that the sanction for production of tanks accorded by the Ministry in August 1996 in the absence of approval from CCS was irregular and that the commencement of production of LSP even before reference tank meeting the imperatives stipulated by the user was questionable.

[Sl. No. 6, Para 66 of Appendix to 5th Report of PAC (13th Lok Sabha)]

Action Taken by the Ministry/Department

As already explained, CCPA paper seeking approval for production of 124 tanks had been initiated by the Department of Defence in 1995-96 based on the performance of PPS tanks. Pending CCPA approval, a decision was taken in the 27th Steering Committee Meeting held on 10 Apr. 1996, to go ahead with the production of a limited number of 15 tanks, as the frist batch of 124 tanks; in order to maintain continuity and for planning purposes. Now that, the Army has placed an indent for the procurement of 124 Arjun Tanks including 15 LSP Tanks, all the committed expenditure so far for Limited Series Production (LSP) Tanks will be tansferred to the sanction of 124 Tanks. However the Committee's observations have been noted for future guidance.

Audit Query: Para 66

Ministry may indicate instructions/guidelines issued to Army HQ to avoid recurrence of such actions which may, sometimes, lead to infructuous investment/expenditure.

Reply to Para 66

The observations have been noted by DRDO for future guidance.

Additional Query to Para 66

DRDO had indicated that the observations have been noted for future compliance. However, no instructions/guidelines have been so far issued by Ministry/DRDO to Army HQ to avoid infructuous investment/expenditure of such nature. Necessary instructions may be issued and copy sent to PAC/Audit.

Reply to Para 66

The reasons for taking a decision to go ahead with the production of a limited number of 15 tanks have been explained in para 66. However, the observations of PAC have been noted by DRDO for future guidance. No guidelines are required to be issued to AHQ in this regard.

[Ministry of Defence /Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01
dated 04 March 2003]

Recommendations and Observations

The Committee observe that as the indigenous efforts to develop a suitable engine and transmission system for the MBT were beset with problems, 42 power packs with transmission units were imported for use on the prototypes and PPS tanks. As far as indigenisation of power pack is concerned, the Committee were given to understand that our ordnance factories are, equipped with, and, capable of manufacturing power pack and if volumes justify, license manufacture of power pack can be undertaken. The Committee would like to be apprised of the developments effected in this field.

[Sl. No. 10 Para 70 of Appendix to 5th Report of PAC
(13th Lok Sabha)

Action Taken by the Ministry/Department

The power packs required for 124 Arjun tanks, the order for which has just been placed, are being imported. Licence for manufacture of power pack in India is not economical for this quantity. As and when army places order for larger volumes, the licence for manufacture of power packs in India will be availed.

Audit Query: Para 70

Ministry may indicate efforts taken by DRDO in the development of indigenous engine on which Rs. 2.42 crore was spent up ot March 1988 (AP 43.07 of No. 2 of 1989 refers) Whether these development efforts were not useful indigenous production of power pack?

Reply to Para 70

Please refer answer to para 62 (i)

[Ministry of Defence /Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01
dated 04 March 2003]

Recommendations and Observations

78. The Committee's examination has revealed that 33 Boyavayika Machino Pekotis (BMPs) of Russian origin valued at Rs. 66 crore introduced into service during 1982 and 1983 were received in a mechanised unit with defective Image Converter (IC) tubes affected their efficiency during night operations. Unfortunately, the defective IC tubes are yet to be replaced. The Ministry stated that IC tubes which are used in Infra Red Night Vision Device for gunner and commander were not replaced due to certain limitations like very small shelf-life, detection by the enemy at lower ranges than it gives to the crew and rapid deterioration in performance that did not allow exploitation of the full potential of the weapon system. The Committee are constrained to point out that knowing fully well that the technology was of the sixties vintage, the Ministry decided to retain this outdated technology to the limit of new production under the pretext that 'something was better than nothing at all'. This is unfortunate to say the least. The Committee have now been informed that the Army was in the process of trial evaluation of newer and latest Thermal Imager System in their pursuit for seeking replacement of defective IC tubes. Deploring the failure to take timely action in suitable replacing defective IC tubes, the Committee recommended that the matter should be looked into with a view to fixing responsibility and a stutus report on the proposed introduction of Thermal Imager System should be furnished to the Committee within a period of three months.

[Sl. No. 18, Para 78 of Appendix to 5th Report of PAC
(13th Lok Sabha)]

Action Taken by the Ministry/Department

Image Conveter (IC): Image Converter or IC tube, which in 1982, 83 were "State of Art" night vision devices (NVDs) were fitted in all tanks and BMPs. These were active Infra Red (IR) devices where the source of light was an infra red lamp and IC tubes changed the IR image to visual image. The IC tubes had a limited shelf life and as a result were replaced when the range was reduced in 50% of the pesented range (these were then replaced by ordinance as one to one replacement).

The 33 BMPs which were imported in 1982, 83 were having IC tubes. It is possible that in storage, the IC tubes could have outlived the shelf life, but the BMP when issued to field formations would have had them replaced by new IC tubes from ordnance and exploited fully. Out of a total 745 BMP-I induced in thes services (incl. 375 in 1982 and 83) only two unit now have it and rest are now with supporting arms and used as troop carriage.

[Ministry of Defence/Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01
dated 04 March 2003]

Image Intensifer (II) Tubes: The Indian Army is still using IC tubes, as new technology of Image Intensifer tubes is being tried. Approximately 100 are now being fitted in tanks (T-72) and BMP-2 ex HVF, Avadi and Veh. Factory, Medak without trials as IC tubes are not available in the world. In 2001, trials are being conducted for II tubes as these are unlike IR, passive NVDs and are currently in use by several countries.

Thermal Imaging (TI) sight: There is no plan now or in the future to fit TI sight for drivers as they are very expensive. However trials have been carried out for TI sights for gunner, GS evaluated and are likely to be inducted for a certain numbers of T-72 tanks and BMP missiles.

From the above it may be seen that no BMPs could have remained unexploited or unused for want of night vision devices and all tanks and ICV have a system to replace those that are unserviceable or have outlived the shelf life as they cost a fraction of the cost of tank or BMP. In 1982/83, IC tubes were state of art night vision devices, then came II tubes and now TI sights. Army can only purchase what is easily affordable. It is stated that there was no one who could have been blamed as there was no negligence.

Audit Query Para 78

The prospects and replacement of 33 defective IC tubes need mention in the replies.

Thermal Imaging (TI) sights

Ministry had again indicated only that TI sights for gunner are likely to be inducted. The probable date of its induction, status report on their proposed introduction are yet to be intimated to PAC which may be done now.

Reply to Audit Query

Vintage of Technology

At the time of procurement of BMP-1s (1982-83), infra red (IR) based night vision devices were state-of-the-art technology providing night vision upto 1 Km. This was also the most cost effective solution.

IR technology was based on an active source which could be picked up by the enemy. It is because of this reason that armies are world over decided to switch over to passive system such as image intensifiers (II). II based technology was inducted into Indian Army towards end 80's in the form of night vision goggles and gunner sights of BMP-II.

Thermal Imaging (TI) systems are state of art technology permiting night vision upto 5 kms and beyond. This technology has now been introduced into Indian Army with T-90 tanks. Case for procuring TI Sights for the BMP-II anti tank guided missile system is under progress with MoD. The TI systems are very expensive, hence they are being inducted into tanks BMP in a phased manner.

Prospects of Replacement of Defective IC Tubes

The 33x BMP-1s in question were issued to Mechanised Infantry units in 1982-83 with IC tubes in working condition. These BMP were subsequently tranferred to 6

GUARDS in 1988-89 and during an inspection in 1991, the IC tubes were found defective. The vehicles by then had been exploited for about nine years and the IC tubes had by then outlived their shelf life. Replacements for the defective IC tubes of these 33 x BMP-1s were demanded by the dependent workshop. By this time, Image Intensification (II) technology was being indigenously developed by OLF, Dehradun. Our desire to go to the indigenous soruce (OLF-Dehradun) and rapidly changing technology in night vision devices resulted in non-replacement of IC tubes.

15 BMP 1 vehicles of the 33 have been backloaded to depot after having been declared Class V (ie after completing service life) and remaining BMP's have been transferred to Artillery units as support vehicles for futher exploitation till completion of service life.

Therefore, it will be seen that the 33x BMP-1s have been fully exploited during their service life and IC tubes became defective only after approximately nine years of usage i.e. after prescribed shelf life. By the time the IC Tubes became defective, IR based technology had already become obsolete and replaced by II technology. Indigenous development of II technology was undertaken by OLF, Dehradun and a series of trials were conducted after development from 1998 onwards. Since the trails have not been successful, it was decided to obtain the II based sights through a global REP. It may therefore be appreciated that no lapse has occurred for which the responsibility needs to be fixed.

Thermal Imagine (TI) Sights

Case for procurement of TI sight for firing anti-tank guided missile (ATGM) is being progressed with the MoD. The RM has approved the GS evaluation on 29 Dec. 2001. The TI sights are likelyh to be inducted once the Price Negotiation Committee has concluded and a contract is finalised.

Audit Query: Para 78

Ministry may also please elaborate on the latest progress made in conclusion of the contract for Thermal Imaging Sight.

Reply to Para 78

PNC for procurement of 969 TI Sight for BMP-II has been completed in Nov 02. Contract is liely to be signed shortly.

[Ministry of Defence/Department of Defence Research & Development
OM No. DBFA/FA/83613/M/01
dated 04 March 2003]

No. Vehs./57155/RD-156/401/S/D(R&D)
Government of India,
Ministry of Defence,
Department of Defence Res. & Dev.,
New Delhi, the 6th Sept. 2000.

To

The Director General Res. & Dev.,
Defence Research & Development Orgn.,
New Delhi.

SUBJECT: *Revision of Cost, PDC and Closure of the Project MBT Arjun on successful completion.*

Sir,

I am directed to refer to Ministry of Defence letter No. Vehs/RD-92/0189/74/232/S/D(R&D) dated 2nd May, 1974 as amended from time to time regarding the project, "Design and Development of Main Battle Tank (MBT) Arjun", (Project No. SL-PX-74/VRD-F4.00) and to convey the approval of the President for the following:—

(a) Extension of the PDC of MBT Arjun Project from 1st April, 1993 to 31st March 1995 and its closure from this date as the project has been successfully completed.

(b) Revision of the project cost from Rs. 280.00 crore (FE of Rs. 102.32 crore) to Rs. 305.60 crore (FE of Rs. 97.85 crore).

2. This letter issues with the concurrence of Ministry of Defence (Finance/R&D) *vide* their Dy. No. 1544/IF(R&D)2000 dated 4.9.2000.

Yours faithfully,

Sd/-
(N.C.S. Negi)
Deputy Secretary to the Government of India
Tel. 23015255

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CHAPTER IV

RECOMMENDATIONS/OBSERVATIONS REPLIES TO WHICH HAVE NOT BEEN ACCEPTED BY THE COMMITTEE AND WHICH REQUIRE REITERATION

—Nil—

CHAPTER V

RECOMMENDATONS/OBSERVATIONS IN RESPECT OF WHICH GOVERNMENT HAVE FURNISHED IN INTERIM REPLIES

—Nil—

NEW DELHI;
11 *December*, 2003
20 *Agrahayana*, 1925 (*Saka*)

SARDAR BUTA SINGH,
Chairman,
Public Accounts Committee.

PART-II

MINUTES OF THE THIRTEENTH SITTING OF THE PUBLIC ACCOUNTS COMMITTEE (2003-2004) HELD ON 8 DECEMBER, 2003

The Committee sat from 1500 hrs. to 1522 hrs. on 8th December, 2003 in Committee Room "B", Parliament House Annexe, New Delhi.

PRESENT

Shri Rup Chand Pal — *In the Chair*

MEMBERS

Lok Sabha

2. Shri Haribhai Chaudhary
3. Shri Raghunath Jha
4. Dr. Nitish Sengupta
5. Shri Brij Bhushan Sharan Singh
6. Shri Kirit Somaiya
7. Shri Bhartruhari Mahtab

Rajya Sabha

8. Shri Santosh Bagrodia
9. Shri Prasanta Chatterjee
10. Shri K. Rahman Khan

SECRETARIAT

1. Shri P.D.T. Achary	—	*Additional Secretary*
2. Shri Raj Shekhar Sharma	—	*Deputy Secretary*
3. Shri B.S. Dahiya	—	*Under Secretary*

OFFICE OF THE COMPTROLLER & AUDITOR GENERAL

1. Shri P. Sesh Kumar	—	Pr. Director
2. Smt. Minakshi Ghosh	—	Pr. Director

2. In the absence of Chairman, the Committee chose Shri Rup Chand Pal to act as Chairman for the sitting under Rule 258(3) of Rules of Procedure and Conduct of Business in the House.

3. The Committee then took up for consideration the following draft Reports:—

(i) *** *** ***

(ii) Draft Report on action taken on the recommendations contained in 5th Report of PAC (13th Lok Sabha) relating to "Design and Development of Main Battle Tank—Arjun".

(iii) *** *** ***

4. While commending the draft reports, the Committee adodpted those without any modifications or amendments.

5. The Committee authorised the Chairman to finalise the draft Reports in the light of changes, if any, arising out of factual verification by Audit and present the same to the Houses in the current session of Parliament.

The Committee then adjourned.

APPENDIX

CONCLUSIONS AND RECOMMENDATIONS

Para No.	Ministry/ Deptt. concerned	Conclusions/Recommendation
7.	Defence (Deptt. of Defence Production & Supplies) and DRDO	In their earlier Report, the Committee had expressed serious reservations about the inordinate delay in the different phases of productionisation of MBT Arjun, which had frustrated the planned replacement of existing tanks. The Committee were informed that the first regiment was expected to be equipped with the Main Battle Tank from the year 2002 and two regiments were planned to be equipped by the year 2007 *i.e.* by the end of the 10th Plan. However, not a single tank has yet rolled out from Heavy Vehicles Factory (HVF). This, the Committee believe, will have serious adverse impact on the entire planning in respect of equipping our Army. The Committee therefore, desire that the Ministry should closely monitor the production schedule at HVF with a view to ensuring that the requisite number of tanks indented by the Army are made available to them within the stipulated time. The Committee also urge upon the Ministry to see that the infrastructural facilities created at HVF are utilized optimally so that the desired volume of production of MBTs is achieved which in turn will help in the progressive reduction of the import content. The Committee may be apprised of the progress made in the production of MBT-Arjun in due course.

MGIPMRND—4750LS—25-04-2004.