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INDUCTION OF AN AIRCRAFT

MINISTRY OF DEFENCE

PUBLIC ACCOUNTS COMMITTEE
1994-95

EIGHTY-FIFTH REPORT

TENTH LOK SABHA

LOK SABHA SECRETARIAT
NEW DELHI

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PUBLIC ACCOUNTS COMMITTEE (1994-95)

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Presented to Lok Sabha on 22 March, 1995
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LOK SABHA SECRETARIAT
NEW DELHI

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INTRODUCTION

I, the Chairman of the Public Accounts Committee, as authorised by the Committee, do present on their behalf this Eighty-fifth Report on Paragraph 6 of the Report of the Comptroller and Auditor General of India for the year ended 31 March, 1992, No. 9 of 1993, Union Government—Defence Services (Air Force & Navy) relating to Induction of an Aircraft.

2. The Report of the Comptroller and Auditor General of India for the year ended 31 March, 1992, No. 9 of 1993, Union Government-Defence Services (Air Force and Navy) was laid on the Table of the House on 11.5.1993.

3. In this Report the Committee have concluded that the execution of the contract for procurement of aircraft 'A' has not been satisfactory. They have noted that the engines for the aircraft were imported in two batches—the first batch called Series-I having a total life of 300 hours before overhaul (TBO) and the second called Series-II with a life of 350 hours before overhaul. However, out of the total 188 aero-engines procured for the aircraft fleet, 158 aero-engines were prematurely withdrawn due to defects till 31 March, 1993. Consequently, an additional expenditure of Rs. 146.70 crores involving outflow of foreign exchange had to be incurred for rectification of these engines which has been withdrawn before completion of the prescribed time before overhaul. What has further concerned the Committee is that as many as 86 out of the 158 aero-engines had been withdrawn prematurely even before completion of 50% of the prescribed life before overhaul. The Ministry had also to incur an additional expenditure of Rs. 75 lakhs on fitment of nose wheel guards to some engines prematurely withdrawn. Surprisingly, the contract executed with the suppliers did not contain any provision to protect the Government's interests in such eventualities. The Committee have therefore, concluded that the contract was not sufficiently detailed particularly in view of the fact that the Government had procured a state-of-art aircraft which was of recent origin and lacked adequate field experience.

4. The Committee have further found that the cumulative effect of premature failure of engines due to design and other defects and the related problems had been that there was considerable shortfall in the performance of the aircraft fleet. As against the target of 75%, the actual serviceability of the aircraft during the years 1992—1994 varied between 54.9 and 59.7 percents. The present utilisation rate of the aircraft fleet is 7 hrs. per month as against 15 hrs./20 hrs. per month as authorized by the Government. The Committee have felt perturbed that despite the enormous money spent on induction and the additional expenditure incurred on

design and other rectifications, the aircraft has failed in performance in terms of the targetted serviceability resulting in restricting the flying efforts and thereby compromising with the operational and training commitments. They have emphasised the need for taking appropriate steps to further improve the serviceability of the aircraft.

5. The Committee have noted with concern that though the contract for procurement of the aircraft was concluded in September 1986 and it was expected that the first engine of the aircraft would be due for overhaul by 1989, no repair facilities had been established for repair/overhaul of the aircraft and its engines. Due to mis-match, four repair contracts for repair/overhaul of 156 engines at a cost of Rs. 180.49 crores were concluded with the manufacturers during a short span of one and a half years *i.e.* during July 1990 to January 1992. In the absence of repair/overhaul facilities, the engines continued to be despatched to the suppliers and an expenditure to the tune of Rs. 195 crores had already been incurred on repair/overhaul of engines and aggregates and an expenditure amounting to Rs. 92.5 crores is expected to be incurred further on this count. Keeping in view the strategic and other operational necessities which influenced the decision for selection of the aircraft 'A' and the level of expenditure incurred on its acquisition, the Committee are of the considered view that the decision not to plan indigenous repair/overhaul facilities simultaneously with the induction of the aircraft was not in the best interest of the country.

6. The Committee have noted that the contract for setting up of repair/overhaul facilities was signed only in August 1991 and as per the present target, the repair facilities involving an expenditure of about Rs. 247 crores would be available by 1996 only. Till that time, the engines obviously would continue to be despatched to the manufecturers abroad for repair/overhaul at a considerable cost. Significantly, this would also increase the turn round time and reduce considerably the availability of the fleet. The Committee have recommended that all concerted efforts should be made by the Ministry for expeditious completion of the indigenisation project for repair/overhaul. They have further recommended that in future while negotiating such main contracts Government should also try to finalise the contracts for transfer of technology simultaneously so as to avoid the type of difficulties experienced in the present case.

7. Two sets of flight data ground processing unit costing Rs. 99.52 lakhs each were procured by the Government from the manufacturers under the contract of February 1989. The Committee have been suprised to find that one of these units became unserviceable during warranty period and it still lying unutilised. Although a provision existed in the contract to either repair or replace the defective components, the suppliers failed to meet the same despite the issue being raised at Governmental level. The Committee have been constrained to point this out as yet another area where Government had to suffer heavily due to the glaring inadequacies in the

contractual provisions. While deprecating such a state of affairs, the Committee have recommended that all possible steps should be taken by the Government to obviate such recurrences in future.

8. The Committee have recommended that in the light of the experience in the induction of aircraft 'A', all possible corrective/remedial steps should be taken to prevent occurrence of such difficulties in future with a view to ensuring that the defence requirements are met timely, effectively and without any compromises and incurring of extra expenditure of sizeable magnitude as in the present case is avoided.

9. The Committee examined the Audit paragraph at their sitting held on 8.9.1994. The Committee considered and finalised the report at their sitting held on 20.2.1995. Minutes of the sittings form Part-II* of the Report.

10. For facility of reference and convenience, the observations and 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-II to the Report.

11. The Committee would like to express their thanks to the Officers of the Ministry of Defence for the co-operation extended to them in giving information to the Committee.

12. 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;
24 February, 1995
5 Phalguna, 1916 (Saka)

BHAGWAN SHANKAR RAWAT,
Chairman,
Public Accounts Committee

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REPORT

Audit Paragraph

This Report is based on Paragraph 6 of the Report of the Comptroller & Auditor General of India for the year ended 31 March, 1992 (No. 9 of 1993), Union Government—Defence Services (Air Force & Navy) relating to Induction of an Aircraft which is appended as Appendix-I.

Introductory

In order to fill the gap in the force level of Indian Air Force (IAF) and to enhance its operational capability, the Government of India concluded a contract with aircraft manufacturers of a foreign country (Manufacturers) in September 1986 for procurement of certain numbers of a twin engined aircraft alongwith spares, related equipment, weapons and 32 spare engines at a total cost of Rs. 1,388 crores. The aircraft were received between 1986 and 1990 as scheduled and inducted into the squadron from 1987. In May 1988 the Government approved procurement of a few more aircraft on offer from the manufacturers for raising another squadron. Accordingly, another contract for procurement of a few more aircraft with related equipment, weapons and 16 spare engines was concluded with the manufacturers in February 1989 at a total cost of Rs. 821 crores. Two sets of flight data ground processing unit costing Rs. 99.52 lakhs each were also procured under the contract of February 1989. All the aircraft and equipment on order were received during 1990. The aircraft fleet was to be sustained till the turn of the century. The flying task approved by the Government for the aircraft fleet was 15 hours per aircraft per month for combat aircraft and 20 hours per aircraft per month for trainers. The Indian Air Force perspective plan 1985—2000 was taken as the basis for assessment of the number of aircraft to be procured and squadrons raised.

Selection of the Aircraft

2. According to the Ministry of Defence the selection of the aircraft was made in the context of the prevalent/perceived threat scenario and available options. Out of the options available at that time, the selection of aircraft 'A' was guided by its operational advantages, cost effectiveness and attractive conditions for payment on credit. The operational and technical aspects of the aircraft was also evaluated by the Evaluation Team from the Ministry of Defence before procurement was effected.

3. In this connection, the Committee desired to know whether any Air Staff Requirement (ASR) was formulated before going in for the procurement of the aircraft and was the aircraft evaluated as per ASR. In a note furnished to the Committee, the Ministry of Defence stated that the

aircraft was evaluated as per ASR, which was formulated prior to the procurement of the aircraft 'A'. The flight evalution revealed that in overall terms, the aircraft 'A' was amongst the best fighter aircraft available in the world at that time and was considered suitable for induction into IAF as a dedicated air superiority fighter.

4. Keeping in view the large requirements of Indian Air Force the Committee specifically desired to know whether at any time licensed production of this aircraft was considered and negotiated with the manufacturers. In a note furnished to the Committee the Ministry of Defence stated that the option of licence manufacture of these aircraft in India was, considered, but found economically not viable as the requirement for additional aircraft 'A' was pruned down after a high level review carried out by the Air Force, considering (a) some of the limitations of the aircraft, as noticed during its exploitation pertaining to electronic warfare, limited Time Before Overhaul (TBO), and higher operational cost and (b) the desirability of ensuring a proper mix of aircraft with the major proportion of the fleet involving less financial burden, and of the work horse type and the rest being divided between high technology, single role aircraft and multirole aircraft. Besides, the erstwhile manufacturers also had not shown any interest in by back arrangements, which would have improved the economic viability of the project.

5. Enquired whether the problems arising out of repairs/overhaul and the production support were visualized and examined in the evaluation undertaken for selecion of the aircraft particularly in the light of the past experience from the same manufacturers, the Ministry of Defence in a note replied that they did not have any serious product support problems with the same manufacturers with regard to the other variants of the aircraft 'A'. As regards the problems arising out of repairs/overhaul, the Ministry stated that the earlier variants cannot be totally equated since the aircraft 'A' incorporated a number of avionic concepts which the earlier ones had lacked. The Ministry also stated that the aircraft was itself of recent origin and lacked adequate field experience.

Premature failure of aeroengines

6. According to the Audit Paragraph, the aircraft fleet had been giving extensive problems in operation and maintenance since its induction mainly due to the large number of premature failure of engines, components and systems.

7. Engine defects necessitating removal of the engine from the aircraft for undergoing repairs is called engine withdrawal. It has been pointed out by Audit that out of the total 188 engines available in the fleet, 139 engines (74 per cent) costing Rs. 326 crores failed prematurely and had been withdrawn by July 1992. The Audit Paragraph further revealed that 62 engines were withdrawn prematurely even before completion of 50 per cent of prescribed overhaul life which was 300 hours.

8. Explaining the position, the Ministry stated that 188 aeroengines (140 fitted on aircraft and 48 reserve) were procured for the aircraft 'A' fleet. The engines were imported in two batches — the first batch called Series I having a total life of 300 hours before overhaul and the second called Series II with a life of 350 hours before overhaul. Out of these 188, 158 aeroengines arisings were prematurely withdrawn till 31 March, 1933 and 86 of these arisings had completed less than 50% of their prescribed life before overhaul (TBO). These withdrawals were stated to have spread over a period of six years in various stages of usage of engines.

9. The Committee enquired whether the contract for procurement of aircraft 'A' concluded with the manufacturers provided any clause to safeguard the interest of Indian Air Force in cases where the TBO life had not been fully met. The Ministry of Defence in their note stated that no manufacturer accepts a blanket warranty clause specifying penalties for not meeting the TBO life. According to the Ministry, the accepted norm in the contracts concluded was to specify warranty liability for a specified period of time/flying hours as acceptable to both parties. Based on this, the Ministry stated that the contract for procurement of aircraft 'A' had specified a warranty period of 12 months for the engines installed on the aircraft and 18 months for the additional engines procured.

10. The two main causes for premature withdrawals of aeroengines, where engines had not completed 50% of the prescribed time before overhaul (TBO) life, were:

(a) Nozzle Guide Vane (NGV) cracks

(b) Damage due to foreign object ingestion (FOD)

11. According to the Ministry, frequent failure of Nozzle Guide vanes (NGV) was projected as a design deficiency by them and, therefore, the suppliers were repeatedly requested, at Governmental level, to carry out repair of engines withdrawn due to this reason free of cost. However, the contention was not accepted by the suppliers and they, in fact, did not respond to the Ministry's requests. Efforts were also made to pursuade the suppliers to levy repair charges in proportion to the useful life given by the engines before their withdrawal. The issue was also followed up subsequently. However, according to the Ministry all the efforts failed to elicit any favourable response from the suppliers.

12. On being enquired about the remedial steps taken to overcome the NGV cracks, the Ministry stated that by fitment of improved nozzle guide vanes during repair/overhaul, this problem to large extent had been controlled. The Ministry added that by taking recourse to these measures increase in the average hours done by the engines has been achieved. As regards FOD problem, the Ministry stated that efforts were made to have the modification carried out free of cost by claiming it as a design deficiency. The suppliers, however, termed it as an operational improve-

ment. The manufacturers had since carried out modification in June 1992, on some aircraft at a reduced cost of Rs. 75 lakhs instead of Rs. 1.26 crores. The subsequent batch of aircraft was delivered with nose wheel guards duly fitted thereon. According to the Ministry since fitment of nose wheel guards in June 1992, there have been only few cases of FOD.

13. According to Audit, since the fitment of nose wheel guards had to be introduced due to lack of quality control at the time of construction of the aircraft, the entire cost of nose wheel guards and their fitment should have been borne by the manufactures. The manufacturers however did not pay any compensation as there was no such clause in the contract. In this connection, the Committee enquired to know the reasons for not including such clauses in the contract, which could have safeguarded IAF's interests against design deficiencies and manufacturing defects. In reply, the Ministry stated as follows:—

> "Standard of preparation of aircraft procured by us in 1986 did not include fitment of nose wheel guards. Moreover, non-fitment of nose wheel guards cannot be attributed to the lack of quality control in the construction of aircraft, since this is a subsequent operational improvement. It was only in the subsequent stages that the fitment of nose wheel guards was found to prevent ingestion of foreign objects thrown up from outside by fast rotating nose wheel of the aircraft."

14. Replying to a specific query from the Committee as to whether any penalty clause had been provided for in the contract for engines not meeting the prescribed time before overhaul, the Secretary, Ministry of Defence explained:—

> "If it is due to a manufacturing defect, they (Suppliers) replace it free of cost. If it is not due to a manufacturing defect or if it is due to some operational condition, then we have to bear the cost. No penalty clause exists."

15. In view of the fact that a large number of engines failed and had been withdrawn prematurely, the Committee enquired as to whether substandard engines were supplied by the suppliers. In response, the Secretary of the Ministry further stated in evidence:—

> "Once an engine has to be removed from an aircraft for repair, it is called an engine withdrawal. If need not be for any major reason. It may be for minor repairs. It does not mean that we have been supplied substandard engines nor does it mean that it had to be removed for some major defect."

The witness further added that in all 185 engines had been withdrawn.

16. On being asked about the total cost incurred so far on those engines which were withdrawn prematurely, the Ministry in a post-evidence note informed the Committee that an amount of Rs. 146.7 crores had been paid so far for the purpose.

17. When enquired about the latest position of hte despatch of engines for repair/overhaul and their receipt on return the Ministry stated that 35 engines (26 non-warranty and 9 under warranty) were presently with the manufacturers for repair/overhaul. These engines were expected to arrive shortly. 36 engines (29 non-warranty and 7 under warranty) are awaiting despatch for repair/overhaul.

18. On being asked about the approximate total additional expenditure which would be incurred after repair/overhaul of these 71 engines, the Ministry in a note furnished subsequent to evidence stated to be as follows:—

> "out of 71 engines mentioned above, 16 engines are to be repaired free of cost under warranty. The estimated expenditure on balance 55 engines is Rs. 92.5 crores."

19. The Committee enquired whether there had been long delays in getting the engines back after repair/overhaul from the manufacturers. The Defence Secretary stated in evidence:—

> "The point.....is very correct. We did have long gaps, long delays in getting the engines repaired and sent back to us."

20. The procurement of aircraft 'A' was intended to fill the gap in the force level of Indian Air Force and enhance its operational capability. However, the premature failure of the engines, system etc. had evidently caused a major setback to the serviceability status of the feet. When asked to comment on the same, the Defence Secretary deposed in evidence:—

> "In terms of number of engines withdrawn and the number of hours the aircraft have flown, I will not say that this is an alarming situation."

21. On being asked to indicate the precise extent to which it had restricted the flying efforts and thereby compromised the operational and training commitments, the Ministry in a note furnished to the Committee explained:—

> "The utilisation rate of the aircraft has deliberately been restricted in order to conserve the available resources, ensure the availability of minimum number of aircraft when inductions for overhaul commence in end 1996 and keeping in view the poor product support from the suppliers. However, reduced flying and training efforts were resorted to without compromising quality thereof."

22. Asked whether the difficulties arising out of withdrawal of engines faced in the present case had been experienced in any other similar contracts earlier, the Defence Secretary stated in evidence:—

> "We had done a comparative study of engine withdrawals of other contracts in relation to one parameter, that is foreign object damage. I must tell you frankly that aircraft 'A' had the worst record. But

after the installation of nose wheel guards, that problem has been overcome."

Shortfall in performance of the aircraft

23. According to the Audit paragraph, there was significant shortfall in performance of the aircraft fleet. While shortfall was 20.21 per cent in 1987, it was as high as 64.58 per cent in 1990 and 48.07 per cent in 1991 in respect of the combat aircraft. The shortfall in training efforts ranged between 58 to 83.51 per cent during these years (1987-1991).

24. When enquired about the reasons for significant shortfall in performance of the aircraft fleet, the Ministry of Defence in a note stated that shortfall indicated was based on the utilisation rate, which lays down the maximum (outer) limit. There was no restriction on flying lesser hours. Nevertheless, in an effort to conserve the available resources, and taking into account the poor product support, reduced flying and training efforts were resorted to without compromising quality thereof. These efforts according to the Ministry resulted in lower than the authorised flying. It was further stated by the Ministry that in later years, some problems were encountered in the exploitation of the aircraft due to premature failure/ grounding of some aeroengines, uncertain product support from erstwhile supplier due to their internal problems and consequential break-up of the manufacturing country.

25. Commenting on the shortfall in performance of the aircraft in this regard the Secretary, Ministry of Defence during evidence deposed:—

"The optimum serviceability rate which you can expect in an extremely well-maintained aircraft would be between 70 and 75 per cent. So, we must start from the figure of 75 per cent..... In 1987, we had a serviceability rate of 76.71 per cent for figures which is extremely good. In 1988, it was 71 per cent which is also a very good figure. In 1989, it had come down to 57 per cent. In relation to 70, 57 is a 13 per cent fall in serviceability rate. It went upto 69 in 1990 because one more squadron was inducted at that time. Then it went to 67.4 in 1991. 1992-93 was the period when there was shortfall and this in the period.....Where there was chaos in the manufacturing country. But, that position has now started improving. We are again on the upward curve. So, during these two years I admit that, there has been a shortage, less than desirable rate of serviceability."

26. In a post-evidence note, spelling out the exact level of shortfall since induction of the aircraft till 31 July 1994, the Ministry elaborated the position as follows:—

"Year	Serviceability	Hours flown	Utilisation rate/ A/C/Month
1987	76.7	1157	8.3
1988	71.3	3142	7.3

"Year	Serviceability	Hours flown	Utilisation rate/ A/C/Month
1989	57.3	2923	7.6
1990	64.0	3072	6.8
1991	67.4	4544	7.9
1992	59.7	3658	6.4
1993	54.9	3449	6.0
1994 (Till 31 July 1994)"	55.7	1627	6.8

27. As regards efforts made to improve the exploitation of the aircraft 'A', the Ministry have stated as follows:—

"The suppliers have failed to honour their obligations to provide spares/other equipment as well as repair/overhaul facilities for 10 years from the date of delivery, inspite of being continuously impressed upon them the urgency in this regard through protracted correspondence and meetings at various levels. The persistent and determined efforts finally culminated into conclusion of various new contracts/agreements, during February/March 1993. With the conclusion of these contracts, the product support for defence stores/ equipment from the suppliers is expected to improve. As a result of protracted correspondence and concerted efforts/discussions, the suppliers have agreed for transfer of repair/overhaul technology to enable setting up of indigenous facilities, which will go a long way in improving the serviceability of the aircraft. The individual proposals for establishment of various facilities are at different stages of execution. Besides, in-house efforts were made for repairing various aggregates.

The reasons for high premature withdrawal have been identified. While the problems arising due to Foreign Object Damage and cracks in Nozzle Guide Vanes have been resolved to a considerable extent by fitment of nose wheel guards. The other residual problems relating to engine lubrication and failure of tribune blades will be looked into by specialist from the manufacturing country.

Efforts have continued to be made at the Governmental level to expedite settlement of the shipping problems between the suppliers and another country which affects the return of repaired overhauled arisings."

28. Apprising the Committee of the precise steps taken to improve the product support and spares from the suppliers, the Secretary of the Ministry stated:—

"We have taken a number of measures in this context. The first and foremost is, we have gone in for a high degree indigenisation. Specially Empowered Task Forces have been set up in the Ministry and they have been working on indigenising the spares. The Prime Minister has given us a target whereby the level of indigenisation must be stepped up to 70 per cent from the present rate of 30 per cent in terms of value by the turn of the century. The other thing that we have done is that we found that in addition to the suppliers, there were other countries from where we can get some of these spares. We had sent two Empowered Delegations. They have gone and done a lot of contracting and many of these items have started coming in. Because of this, the support and spares availability has substantially improved over the last two years....."

29. In this connection the Committee further enquired to know the additional financial burden on the Government in terms of rectificatory steps taken/proposed to be taken in improving the serviceability of the aircraft. In the post-evidence note furnished to the Committee, the Ministry have stated as follows:—

"The total expenditure incurred on repairs so far, since 1987, is given below:-

(a) Repair/overhaul of aeroengines : Rs. 192.14 crores

(b) Repair of aggregates : Rs.3.25 crores

Repair/overhaul charges for 26 non-warranty engines presently with the suppliers and 253 aggregates under repair in another country are yet to be paid. The expenditure incurred on repair of engines/ aggregates would have routinely occurred and there are no additional charges due to manufacturing defects. Rs. 75 lakhs were spent on retro-mod of some aircraft with nose wheel guards."

30. Apprising the Committee of the present utilisation rate of the aircraft as compared to the maximum limit laid down by the Indian Air Force it was stated that each fighter aircraft is authorised to fly 15 hrs. per month. However, there was no restriction on flying lesser hours. The present utilisation rate was 7hrs.

Mis-match between induction of the aircraft and overhaul/repair facilities

31. The Audit paragraph has revealed that though the contract for procurement of the aircraft was concluded in September 1986 and it was expected that first engine of the aircraft would be due for overhaul by 1989, no repair facilities had yet been established for repair/overhaul of the aircraft and its engines. Due to mismatch, four repair contracts for repair/overhaul of 156 engines at a cost of Rs. 180.49 crores were concluded with the manufacturers during a short spare of one and a half years (July 1990 to January 1992). The Audit also pointed out that by the time the facilities are set up (which was then expected to be only by end of 1994) more than 50 per cent of the total technical life of most of the aeroengines (800 hours/8 years) would have been completed.

32. In the light of the Audit objections and the submission made by the Ministry that the serviceability state of the aircraft fleet suffered due to non-availability of repair/overhaul facilities and lack of product support, the Committee enquired whether the product support and the transfer of repair technology were negotiated with the manufacturers at the time of finalising the procurement deal and followed up subsequently. In their note the Ministry have stated as follows:—

> "The contract concluded for supply of aircraft 'A' stipulates that the suppliers were to provide spares and other equipment as well as repair/overhaul facilities for 10 years from the date of delivery. However, this clause was not honoured by the supplies to our satisfaction. The transfer of repair/overhaul technology, was agreed to by the suppliers. The suppliers have, after lot of persuasion, agreed for the transfer of technology for repair/overhaul. An agreement has now been signed with the suppliers for airframe of the aircraft 'A' and aggregates will be established by 1996."

33. Spelling out the reasons for delay in setting up of repair/overhaul facilities as well as efforts made subsequently to expedite the process, in another note the Ministry have added as follows:—

> "The induction of the aircraft took place in May, 1987. Simultaneously, a memorandum was submitted to the suppliers for setting up facilities for repair/overhaul. The repair/overhaul facilities were not, however, planned simultaneously with the induction of aircraft, as need for it would have arisen only after adequate exploitation of the aircraft in service, which in this case is 800 hours/9 years for the air/frame and 300 hours/6 years for series I engines and 350 hours/8 years for the series II engines. If repair/overhaul facilities had been set up simultaneously, these would have remained idle/grossly under-utilised for many years.
>
> No efforts, however, were spared to impress upon the suppliers the need for transfer of repair/overhaul technology and early setting up

of repair/overhaul facilities in India in respect of airframe of aircraft 'A' its aggregates and aeroengines. It was, however, only after protracted correspondence and discussions at various levels that the suppliers finally offered in August, 1990 for setting up overhaul facilities of airframe of the aircraft and its aggregates. The indigenous overhaul facilities are expected to be functional in early 1996.

The Inter-governmental Agreement between the two Governments was concluded on 26th May, 1990 for setting up repair/overhaul facilities for aeroengine and its aggregates. The draft contract for this was received by the end of August 1990 after much follow-up. After detailed examination, comments on the draft contract were forwarded to the suppliers and the same were discussed with the visiting delegation from the manufacturing country in November 1990. While all the issues could be resolved, no agreement could be reached on payment terms relating to exchange rate variation protection clause. This point was taken up by the Ministry of Defence by presenting a memorandum on this issue to the suppliers in January 1991. After vigorous follow-up, the suppliers offered revised draft contract only in April 1991. Revised contract after study and interaction with the suppliers was concluded during meeting held in August, 1991. Considering the delay in setting up of repair/overhaul facilities for aeroengines at HAL, Koraput and the long-turn round time for return of repaired engines from the suppliers, the Government of India have recently approved setting up of limited repair facilities for repair/overhaul of engines at Kanpur. Necessary instruction/authorisation has been sent to Embassy of India, in the foreign country for concluding contract with the manufacturers. The facilities are expected to be operational within one year of the conclusion of contract and would cater to common/routine repairs and save expenditure, which would otherwise be incurred in sending the aeroengines to the suppliers for these common/routine repairs.

34. Elaborating the efforts taken to set up indigenous repair/overhaul facilities, the Ministry in a further note stated:—

(a) *Overhaul of Airframe and its Aggregates*

A team from the manufacturing country visited India in May-June 1993 in connection with discussions on Detailed Project Report (DPR) for setting up overhaul facility of aircraft 'A' Airframe and Aggregates. Indigenous overhaul of Airframe and Aggregates is expected to commence by beginning of 1996."

(b) *Repair/overhaul facilities for Aeroengines and Accessory Gear Box*

The contract for the establishement of these facilities has already been concluded. The execution of the contract has been taken up and the facilities are likely to be functional by 1996-97. Supplementary agreements

in repsect of 98% supplies have been received from the suppliers so far. The actual supplies so far are about 5% of the total requirements.

(c) *Limited Repair facilities for Aeroengines*

In view of the high withdrawal rate of aeroengines and delay in setting up of indigenous repair/overhaul facility at HAL, Government have already approved Air HQ's proposal for setting up limited repair facilities of aeroengines. The contract is likely to be concluded soon with the supplier for transfer of technology and know how to help in setting up these facilities. These facilities would be made operational in approximately within one year's time from the date of conclusion of the contract. Once the facilities are operational, these would cater to normal/routine repairs and help in obviating the need to send these aeroengines to suppliers for the routine repairs."

35. Intimating the latest position, the Secretary of the Ministry informed the Committee during evidence as follows:—

> "The cabinet has sanctioned the setting up of facilities for repair.... Our target (is) to complete the facilities by 1996."

36. Dealing with the Audit point regarding execution of separate contracts for undertaking repairs, the Ministry informed the Committee that the total expenditure incurred on such contracts for engine repair/overhaul till 31st July, 1994 had been Rs. 192.14 crores and on repair of aggregates repairs was Rs. 3.25 crores. It was also stated by the Ministry that the expenditure on repair/overhaul of aeroengines aggregates in future was expected to be Rs. 92.5 crores.

37. In reply to a question of the Committee the Ministry of Defence in a note furnished after evidence stated that an amount of Rs. 458.34 crores had been paid for purchase of spares.

38. When enquired about the estimated expenditure for setting up of repair/overhaul facilities, the Ministry in a post evidence note intimated the position as follows:—

(a) Airframe overhaul project Rs. 157.39 crores.
(b) Engine overhaul project Rs. 89.85 crores.

39. In view of the fact that serviceability of the aircraft has been affected to major extent due to lack of repair overhaul facilities and that the same is expected to be established only by 1996 and also that a sizeable expenditure has already been incurred for the repair/overhaul through separate contracts with the manufacturers, the Ministry's attention was

drawn to the rationality of the initial decision not to plan repair/ overhaul facilities simultaneously with induction of the aircraft. Explaining the position in a post-evidence note, the Ministry stated:—

> "With hindsight, it may appear that planning of repair/overhaul facilities alongwith induction of aircraft may have been advantageous. However, at that time, there were no indications that the manufacturing country would break-up in near future. Our earlier experience with induction of other aircraft did not give us any cause for alarm. In the first 3-4 years of operations, availability of I & II line servicing facilities is sufficient. Thus keeping in view the known lead time for such activities, the suppliers were approached in February, 87 to help us in setting up our own repair/overhaul facilities. There was no response from their side till 1001 probably due to non-availability of such facilities in their own country and later unsettled conditions prevailing there."

40. Asked to comment on the repair project in the light of the fact that more than 50 per cent of the total technical life of most of the aeroengines (800 hours/8 years) would be over by the time the facilities are set up, in a note the Ministry explained:—

> "If repair/overhaul engine facilities had been set up simulaneously, these would have remained idle/grossly under-utilised for many years. The requirement of overhaul of aeroengines would continue to exist, as long as the aircraft is in service. Besides, in the event of Total Technical Life (TIL) of aeroengines being extended, the facility would be exploited for a longer time. All out efforts are being made for early setting up of these facilities."

41. As regards plan to extend the total technical life of aeroengines the Ministry have stated that no engine has come due for total technical life expiry. Some engines may approach their TTL by end 1996. Decision of extension of TTL will be taken depending on premature withdrawal rate, condition of engines and other inputs.

42. On being enquired about the desirability of entering into contracts simultaneously with regard to transfer of technology alongwith the main contract for future purposes, the Defence Secretary stated in evidence:—

> "I fully accept the point in regard to transfer of technology contracts. When we negotiate the main contract, we would simulaneously try to finalise the TOT contracts also."

Non-availability of radar components

43. The Audit paragraph has highlighted that non-availability of radar components also resulted in the grounding of seven aircraft for a period over six to twenty months. Two of these aircraft had not been made functional till June, 1992.

44. Asked whether these radar components were not provisioned in sufficient numbers, the Ministry in another note clarified as follows:—

> "The problem arose because of inadequacy of product support from the suppliers. In the case of high value components like radar parts, limited scales of floats are maintained based on the pattern of consumption. Receipt of such components in a particular time-frame is assumed. However, the parts were not available from the suppliers in the assumed time-frame. The emphasis in case of such high value items is on recycling of available holdings rather than on accumulating the inventory. Offcers were not forthcoming from the suppliers for repairs of these components."

45. In reply to another question the Ministry in a note stated that there was no other source for radar components than the supplier and hence dependence on them could not be avoided.

46. Giving the latest position about the repair efforts made in consonance with the mnufacturers and the present status of availability of rader components, the Ministry have stated:—

> "The response of the suppliers to our repair indents has been inadequate. In the recent past, repair charges have also been steeply hiked. Our efforts to carry our indigenous repairs have succeeded to limited extent. We have also requisitioned services of specialists from the suppleirs from time to time, for field reapirs. One such request is pending with the suppliers at present. However, the problems of repair are likely to continue till our own facilities are avaiable by end 1996 as expected."

47. According to the Ministry all the seven aircrafts which were grounded due to non-availability of radar components have since been made operational between March 1991 and December 1992.

Non-use of imported equipment

48. Two sets of flight date ground processing unit costing Rs. 99.52 lakhs each were procured by the Government from the manufacturers under the contract of February, 1989. According to the Audit paragraph, one of these flight data ground processing units became unserviceable during warrnty period and had been lying unutilised. On being enquired about the specific reasons for unserviceability of Data Processing Unit, the Ministry have explained:—

> "One of these units became unserviceable during warranty period due to unserviceability of its Recording and Playback units and other items. The suppleirs warranty team could not rectify the equipment. Hence, a warranty claim for the item was raised in June, 1990. As per provisions of the contract, the supplier has to either repair or replace the defective components within the shortest possible time after acceptance of the claim. The issue has been taken up with the

suppliers at various levels and it was impressed upon them that non-acceptance of our claim would tantamount to breach of contractual obligations. The equipment is still unserviceable, as the suppliers have so far not given a positive response."

49. In view of breach of contractual obligations by the suppliers as stated in the preceding paragraph the Committee enquired to know the provisions in the contract to meet with breach of such obligations and to what extent those clauses were invoked. In reply, the Ministry in a note furnished after evidence stated:—

"Contractually, the supplier is to repair an item or replace it with a new one if it has failed during warranty period. The warranty claim for unserviceability of Flight Data Analysing Unit were raised on suppliers as stipulated. However, despite repeated requests, even at Government level, the suppliers have not met the contractual obligations."

Sustainability of the aircraft

50. The aircraft fleet was initially planned to be sustained till the turn of the century. With the existing assets as well as intermittent developments taking place the Committee desired to be apprised of the future planning in this regard. In a note the Ministry explained the position as follows:—

"The aircraft 'A' fleet was planned to be sustained till the turn of century. With the existing assets, Government authorised Utilisation Rates (UR), Maintenance Reserve (MR) and Strike Off Wastage (SOW) rates, the UR of three squadron will be sustained. However, there is a scope of sustaining the squadrons upto 2003 with reduced Utilisation Rate and reduced SOW and MR, the possibilities of which would be further explored. Besides, a proposal for acquisition of certain number of aircrafts against the State Credit made available by the suppliers is presently under consideration of the Government. If procured, these additional aircraft will help in sustaining the present fleet for a few more years."

Remedial Steps for Future Contracts

51. In the light of the serious difficulties experienced in the execution of the contract by the foreign supplier in the present case, the Committee enquired to know the measures taken/proposed to be taken by the Ministry of Defence to overcome such situation in the future and ensure that the defence requirements are met timely, effectively and without any compromises and incurring extra expenditure of sizeable magnitude as in the present case. In response the Ministry in a note have stated as follows:—

"Due to the special relationships with the suppliers, the contracts were not strictly commercial in nature. However, with the changed environment and introduction of market economy in the country

safeguards to protect our interests will be incorporated in future contracts to the extent possible. It is also relevant to note that, aircraft 'A' was made avaialble to us at a lower cost and easier terms of payment. The highly extra expenditure due to the teething troubles of this new aircraft in the peculiar circumstances is a relatively small price to pay for such capability."

52. The Secretary of the Ministry stated during evidence:—

"We will definitely look at the possibility of tightening the contractual provisions."

53. In order to fill the gap in the force level of Indian Air Force (IAF) and to enhance its operational capability the Government concluded a contract with aircraft manufacturers of a foreign country in September 1986, for procurement of certain number of twin-engined aircraft alongwith spares, related equipment, weapons and 32 spare engines at a total cost of Rs. 1,388 crores. The aircraft were received between 1986 and 1990 as scheduled and inducted into the squadron from 1987. Another contract for procurement of a few more aircraft with related equipment, weapons and 16 spare engines was concluded with the same manufacturers in February 1989 for raising another squadron, at a total cost of Rs. 821 crores. All the aircraft and equipments on order were received during 1990. The aircraft fleet was to be sustained till the turn of the century and the flying task approved by the Government for the aircraft fleet was 15 hours per aircraft per month for combat aircraft and 20 hours per aircraft per month for trainers. The Committee were informed that the selection of aircraft 'A' was guided by its operational advantages, cost effectiveness and the attractive conditions for payment on credit. The operational and technical aspects of the aircraft were evaluated by an Evaluation Team from the Ministry of Defence as per the Air Staff Requirement (ASR) formulated prior to the procurement of the aircraft. The flight evaluation revealed that in overall terms, the aircraft was amongst the best fighter aircraft available in the world at that time and was considered suitable for induction into Indian Air Force (IAF) as a dedicated air superiority fighter. The examination of the Audit paragraph has however, revealed certain disquieting aspects in the implementation of the contract for procurement of the aircraft 'A'.

54. The Committee note that the engines for the aircraft were imported in two batches—the first batch called series-I having a total life of 300 hours before overhaul (TBO) and the second called Series-II with a life of 350 hours before overhaul. However, out of the total 188 aero-engines procured for the aircraft fleet, 158 aero-engines were prematurely withdrawn due to defects till 31 March, 1993. Consequently, an additional expenditure of Rs. 146.70 crores involving outflow of foreign exchange had to be incurred for rectification of these engines which had been withdrawn before completion of the prescribed time before overhaul. What has further

concerned the Committee is that as many as 86 out of the 158 aero-engines had been withdrawn prematurely even before completion of 50% of the prescribed life before overhaul. The two main causes attributed to the premature withdrawals of the aero-engines where engines had not completed 50% of the prescribed time before overhaul were: (a) Nozzle Guide Vane (NGV) cracks and (b) damage due to Foreign Object Ingestion (FOD). Though the Ministry of Defence had maintained frequent failure of Nozzle Guide Vane as a design deficiency necessitating repairs free of cost, the contention could not carry conviction with the suppliers. The suppliers also did not accept the same claim of the Ministry in respect of FOD problem which they termed as an "operational improvement". Eventually the Ministry had to incur an additional expenditure of Rs. 75 lakhs on fitment of nose wheel guards to the engines prematurely withdrawn due to FOD problem. Surprisingly, the contract executed with the suppliers did not contain any provision to protect the Government's interests in such eventualities. The Ministry of Defence were unable to offer any convincing explanation for the non-inclusion of any suitable clause in the contract which would have safeguarded their interests against such deficiencies/ defects in the design and manufacture of the aircraft. The Committee are, therefore, led to conclude that the contract was not sufficiently detailed particularly in view of the fact that the Government had procured a state-of-art aircraft which was of recent origin and lacked adequate field experience.

55. Apart from the reasons cited above, engines of aircraft 'A' had also to be withdrawn due to other defects which necessitated repair/overhaul. The Committee note that in all as many as 185 engines had been repaired and overhauled so far; 36 engines were presently with the manufacturers for repair/overhaul and 35 were further awaiting despatch. During evidence, the Secretary, Ministry of Defence admitted that there had been long delays of two to three years in getting back the engines after repair/overhaul. As per the information made available to the Committee an expenditure of Rs. 195 crores had been incurred for repair/overhaul of aero-engines/ aggregates. The Committee have been informed that an expenditure amounting to Rs. 92.5 crores is further expected to be paid to the manufacturers for repair/overhaul. It is evident from the facts stated above that aircraft 'A' fleet had been giving extensive problems in operation and maintenance since its induction which is a matter of great concern to the Committee. They desire that action should be taken expeditiously for obtaining back the engines promptly after repair/overhaul so that serviceability of the aircraft is not affected adversely any further. The Committee would like to be informed of the latest position in respect of the number of engines awaiting despatch/return to/from the manufacturer and also the expenditure incurred on the repair/overhaul and on spare parts for the aircraft.

56. The cumulative effect of premature failure of engines due to design and other defects and the related problems had been that there was

considerable shortfall in the performance of the aircraft fleet. As against the target of 75%, the actual serviceability of the aircraft during the years 1992—1994 varied between 54.9 and 59.7 per cents. The present utilisation rate of the aircraft fleet is 7 hrs. per month as against 15 hrs./20 hrs. per month as authorised by the Government. While maintaining that the utilisation rate referred to the maximum hours authorised to fly and that there was no restriction on flying lesser hours, the Ministry of Defence attributed the shortfall in serviceability of the aircraft apart from premature failure of engines to problems arising out of non-availability of avionic aggregates and repair facilities in the country, extremely poor product support due to the changed environment prevailing in the manufacturing country etc. The Committee feel perturbed that despite the enormous money spent on induction and the additional expenditure incurred on design and other rectifications, the aircraft has failed in performance in terms of the targeted serviceability resulting in restricting the flying efforts and thereby compromising with the operational and training commitments.

57. The Ministry of Defence have assured the Committee that they have taken a series of measures for improving the serviceability of the aircraft. These included increasing the degree of indigenisation of spares, execution of new contracts/agreements with other countries for improving the product support, setting up of specially empowered task forces in the Ministry etc. According to the Ministry, these steps have improved the support and spares availability over the last two years. The Committee desire that the Ministry of Defence should take appropriate steps to further improve the serviceability of the aircraft and would like to be apprised of the latest level of serviceability of the aircraft as well as the utilisation rate.

58. It is further disquieting to note that though the contract for procurement of the aircraft was concluded in September 1986 and it was expected that the first engine of the aircraft would be due for overhaul by 1989, no repair facilities had been established for reapir/overhaul of the aircraft and its engines. Due to mis-match, four repair contracts for repair/ overhaul of 156 engines at a cost of Rs. 180.49 crores were concluded with the manufacturers during a short span of one and a half years *i.e.* during July 1990 to January 1992. In the absence of repair/overhaul facilities, the engines continued to be despatched to the suppliers and as pointed out earlier, and expenditure to the tune of Rs. 195 crores had already been incurred on repair/overhaul of engines and aggregates and an expenditure amounting to Rs. 92.5 crores is expected to be incurred further on this count. The Ministry of Defence have contended that the repair/overhaul facilities were not planned simultaneously with the induction of the aircraft as need for it would have arisen only after adequate exploitation of the aircraft in service which in this case is 300 hrs./6 years for Series-I engine and 350 hrs./8 years for Series-II engines and the facilities thus created would have remained idle/grossly under-utilised for many years.

They, however, admitted that in hindsight it may appear that planning of repair/overhaul facilities alongwith induction of aircraft may have been advantageous. But according to them, at that time there were no indications that the manufacturing country would break-up in near future and that their earlier experiences with induction of their aircraft had not given any cause for alarm. Keeping in view the strategic and other operational necessities which influenced the decision for selection of the aircraft 'A' and the level of expenditure incurred on its acquisition, the Committee are of the considered view that the decision not to plan indigenous repair/ overhaul facilities simultaneously with the induction of the aircraft was not in the best interest of the country.

59. The Committee note that the contract for setting up of repair/ overhaul facilities was signed only in August 1991 and as per the present target, the repair facilities involving an expenditure of about Rs. 247 crores would be available by 1996 only. Till that time, the engines obviously would continue to be despatched to the manufacturers abroad for repair/overhaul at a considerable cost. Significantly, this would also increase the turn round time and reduce considerably the availability of the fleet. Ironically, by the time the facilities are set up, more than 50% of the total technical life (TTL) of most of the aero-engines (800 hrs./8 years) would have been completed and some of the engines may approach their total technical life by the end of 1996. The Committee recommend that all concerted efforts should be made by the Ministry for expeditious completion of the indigenisation project for repair/overhaul and apprise the Committee of the precise progress made. They further recommend that in future while negotiating such main contracts Government should also try to finalise the contracts for transfer of technology simultaneously so as to avoid the type of difficulties experienced in the present case.

60. The Committee's examination has further revealed that non-availability of radar components had resulted in the grounding of seven aircraft for a period of over two years. The Ministry have attributed non-availability of these components to inadequacy of product support from the suppliers. They further stated that offers were also not forthcoming from the suppliers for repairs of these components. The Committee are of opinion that proper advance planning by the Government of adequate reserves of the spares could have definitely prevented the grounding of the aircraft for a prolonged period and its consequential impact on training and operational commitments. Unfortunately, such prudence on the part of the authorities concerned was missing. The Committee, therefore, recommend that proper planning be made by the Ministry to obviate such lapses in future.

61. Two sets of flight data ground processing unit costing Rs.99.52 lakhs each were procured by the Government from the manufacturers under the

contract of February 1989. The Committee have been surprised to find that one of these units became unserviceable during warranty period and is still lying unutilised. Although a provision existed in the contract to either repair or replace the defective components, the suppliers failed to meet the same despite the issue being raised at Governmental level. The Ministry of Defence pleaded that since the contracts were not strictly commercial in nature due to special relationship with the suppliers no penalty clause existed to safeguard against breach of such conditions in the contract. The Committee are constrained to point this out as yet another area where Government had to suffer heavily due to the glaring inadequacies in the contractual provisions. While deprecating such a state of affairs, the Committee recommend that all possible steps should be taken by the Government to obviate such recurrences in future.

62. The aircraft 'A' fleet was initially planned to be sustained till the turn of the century. However, according to the Ministry, there is a scope of sustaining the squadrons upto 2003 with reduced Utilisation Rates (UR), reduced Strike Off Wastage (SOW) and Maintenance Reserve (MR), the possibilities of which would be further explored. Besides a proposal for acquisition of certain numbers of additional aircraft are stated to be under the consideration of the Government which if procured will help in sustaining the present fleet for a few more years. The Committee would like to be apprised of the progress made in this regard.

63. From the facts stated in the foregoing paragraphs, the Committee are inclined to conclude that the execution of the contract for procurement of aircraft 'A' has not been satisfactory. While explaining the difficulties encountered by them in this regard, the Ministry of Defence stated that the contract concluded for supply of aircraft 'A' stipulated that the suppliers were to provide spares and other equipment as well as repair/overhaul facilities for 10 years from the date of delivery. However, the clause was not honoured by the suppliers to the Ministry's satisfaction. According to the Ministry, due to the special relationship with the suppliers, the contracts were not strictly commercial in nature. However, with the changed environment and introduction of market economy in that country safeguards to protect our interests will be incorporated in future contracts to the extent possible. The Defence Secretary stated in evidence that a comparative study of other contracts in relation to one parameter, i.e. foreign object damage revealed that engine withdrawals had the worst record in the case of aircraft 'A' until the defects were subsequently rectified. He also assured the Committee to examine the need for tightening the provisions in respect of future contracts. The Committee recommend that in the light of the experience in the induction of aircraft 'A', all possible corrective/remedial steps should be taken to prevent occurrence of

such difficulties in future with a view to ensuring that the defence requirements are met timely, effectively and without any compromises and incurring of extra expenditure of sizeable magnitude as in the present case is avoided.

NEW DELHI;
24 February, 1995

5 Phalguna, 1916 (Saka)

BHAGWAN SHANKAR RAWAT,
Chairman,
Public Accounts Committee.

APPENDIX I

PARAGRAPH 6 OF THE REPORT OF C&AG OF INDIA FOR THE YEAR ENDED 31 MARCH, 1992, NO. 9 OF 1993, UNION GOVT., DEFENCE SERVICES (AIR FORCE & NAVY) RELATING TO INDUCTION OF AN AIRCRAFT

Induction of an aircraft

In order to fill the gap in the force level of Indian Air Force (IAF) and to enhance its operational capability, Government approved in November 1985 procurement of a certain number of aircraft 'A' (aircraft) together with related equipment and weapons. Accordingly, a contract with aircraft manufacturers of a foreign country (manufacturers) was concluded in September 1986 for procurement of certain numbers of a twin engined aircraft alongwith spares, related equipment, weapons and 32 spare engines at a total cost of Rs. 1124.72 crores. The aircraft on order were to be delivered by sea in a disassembled condition by the manufacturers who were to assemble and test-flight the aircraft in India at their expense. The aircraft were received between 1986 and 1990 as scheduled and inducted into the squadron from 1987.

In May 1988, Government approved procurement of a few more aircraft on offer from the manufacturers for raising another squadron. Accordingly, another contract for procurement of a few more aircraft with related equipment, weapons and 16 spare engines was concluded with the manufacturers in February 1989 at a total cost of Rs. 720.31 crores. Two sets of flight data ground processing unit costing Rs. 99.52 lakhs each were also procured under the contract of February 1989. All the aircraft and equipment on order were received during 1990.

The aircraft fleet was to be sustained till the turn of the century. The flying task approved by Government for the aircraft fleet was 15 hours per aircraft per month for combat aircraft and 20 hours per aircraft per month for trainers.

Since its induction there have been significant shortfalls in the performance of the aircraft which had resulted in the squadrons not achieving the full flying task including training efforts. The percentage of shortfall in the flying efforts as compared to the approved task has indicated an increasing trend. While the shortfall was 20.21 per cent in 1987, it was as high as 64.58 per cent in 1990 and 48.07 per cent in 1991 in respect of combat aircraft. The shortfall in training efforts ranged between 58 to 83.51 per cent during these years (1987—1991).

The aircraft fleet had been giving extensive problems in operation and maintenance since its induction mainly due to the large number of premature failure of the engines, components and systems. Of the total 188 engines available in the fleet, 139 engines (74 per cent) costing Rs. 326 crores failed prematurely and had been withdrawn by July 1992. An analysis of the data furnished by Air Headquarters (HQ) in January 1991 and June 1992 revealed that 62 engines were withdrawn prematurely even before completion of 50 per cent of prescribed overhaul life which was 300 hours. According to Air HQ, high rate of premature withdrawal had resulted in a decline of about 10 per cent in the desired serviceability level of the aircraft fleet and consequent low utilisation. Thus the state of serviceability achieved showed a decreasing trend, while the percentage of aircraft on ground (AOG) showed an increasing trend during the years 1987—1990 as detailed below:

Year	Serviceability		Aircraft on Ground	
	Fighter	Trainer	Fighter	Trainer
1987	76.71	84.00	0.76	1.50
1988	71.34	74.30	7.59	2.29
1989	57.33	64.00	19.18	6.82
1990	64.00	47.00	20.50	43.00

Non-availability of radar components also resulted in the grounding of seven aircraft for a period of over six to twenty months. Two of these aircraft had not yet been made functional (June 1992). Besides this, a large number of aggregates and computers also became unserviceable during last three years and adversely affected operational capabilities of the aircraft fleet. Some of the computers were repaired with the help of the specialists from the manufacturers. The computers that could not be repaired had to be replaced. The Ministry stated in October 1992 that during the last three years Rs. 2.88 lakhs were spent on deputation of specialists from the manufacturers to carry out field repairs and 10 computers were imported at a cost of Rs. 2.50 crores to meet the urgent requirement and to build up the float. Apart from this one of the flight Data Processing Units procured at a cost of Rs. 99.52 lakhs became unserviceable during warranty period and was lying unutilised for the past 22 months.

Air HQ stated in March 1991 that the serviceability status of the fleet suffered due to non-availability of repair/overhaul facilities and lack of product support. It further added that premature withdrawals also reduced the fleet availability by 15 to 20 per cent during last three years and therefore, a decision was taken to reduce the utilisation rate of the aircraft fleet.

The premature failure of engines was attributed mainly to:

— discolouration of engine oil;
— appearance of cracks on Nozzle Guide Vanes (NGV) and
— foreign object damage (FOD).

Of the above, eight engines were withdrawn prematurely due to discolouration of engine oil. The manufacturers had accepted it as a design/material deficiency and agreed to repair these engines free of costs. In all, 31 engines were withdrawn prematurely due to NGV cracks. According to Air HQ, the manufacturers had advised that they were deputing a team of specialists to carry out certain adjustments which were expected to reduce the incidence of such cracks. Air HQ intimated in June 1992 that incidence of NGV cracks had reduced after adjustments carried out by the specialists in June-July 1991.

Regarding withdrawal of engines due to FOD, the manufacturers had suspected that in the initial batch of aircraft, FOD had occured due to lack of quality control in construction of aircraft wherein foreign objects had been left behind during assembly. The manufacturers had introduced nose wheel guards to reduce the instances of foreign object damage and all the aircraft delivered by the manufacturers after 1988 were fitted with nose wheel guards. Based on their recommendations, a team of specialists from the manufacturers was called for fitment of nose wheel guards on the initial batch of the aircraft delivered prior to 1988. IAF procured nose wheel guards costing to Rs. 75 lakhs and their fitment in the initial batch of aircraft was completed by June 1992. Since fitment of nose wheel guards had to be introduced due to lack of quality control at the time of construction of the aircraft, the entire cost of nose wheel guards and their fitment should have been appropriately borne by the manufacturers. No action, however, was initiated by Air HQ for recovery of Rs. 75 lakhs, the payment of which was caused due to design deficiency or material failure. The Ministry stated though this was not provided for in the contract, the matter was taken up with the manufacturers who turned it down. This indicates that the contract was not drawn up with adequate care to safeguard the interest of the Government.

It was also noticed in Audit though the contract for procurement of aircraft was concluded in September 1986, and it was expected that first engine of the aircraft would be due for overhaul by 1989, no repair facilities have yet been established for repair/overhaul of the aircraft and its engines. Due to mismatch, four repair contracts for repair/overhaul of 156 engines at a cost of Rs. 180.49 crores were concluded with the manufacturers during a short span of one and a half years (July 1990-January 1992). Of the total 122 engines that failed prematurely, 115 engines had been despatched to the manufacturers for repair/overhaul and 7 engines were awaiting despatch. Only 79 engines had been received

back after repair/overhaul till June 1992. Air HQrs. stated in June 1992 and contract for setting up of repair/overhaul facilities was signed in August 1991 and the repair facilities would be available only by end of 1994. Till that time, the engines would continue to be despatched to the manufacturers abroad for repair/overhaul at a considerable cost (cost of overhaul per engine was Rs. 1.47 crores). This would also increase the turn round time and reduce considerably the availability of the fleet. Also by the time the facilities are set up, more than 50 per cent of the total technical life of most of the aero-engines (800 hours/8 years) would have been completed.

The case revealed the following :

— The aircraft had intensive problems in operation and maintenance since its induction due to premature failure of engines, components and systems, 74 per cent of the engines costing Rs. 326 crores available in the fleet including those procured as reserves failed prematurely within five years and had been withdrawn till July 1992. This had reduced the fleet availability by 15 to 20 per cent and had an adverse impact on the operation and maintenance of the aircraft fleet. This led to a decision to restrict the flying efforts and thereby compromising the operational and training commitments;

— there were significant shortfalls in the performance of the aircraft fleet resulting in shortfalls in operation and training efforts. The shortfall ranged between 20.21 to 64.58 per cent in respect of combat aircraft and 58 to 83.51 per cent for trainers during 1987—91;

— there was mismatch between induction of the aircraft and establishment of its repair facilities. Though the aircraft was inducted in 1987, the facilities for its repair/overhaul was expected to be set up only by end of 1994. Till that time the engines would continue to be sent to the manufacturers abroad for repair. This would result not only in outflow of substantial foreign exchange but also accelerate the turn around time and reduce the availability of engines. Also by the time facilities are set up, more than 50 per cent of the total technical life of engines would be over. Due to delay in setting up of repair facilities, three repair contracts for repair of 156 engines at a cost of Rs. 180.49 crores had already been concluded till January 1992;

— non-availability of radar components resulted in grounding of aircraft fleet. Five aircraft were grounded for a period of over six to twenty months and another two aircraft were still lying non-functional since September—October 1991. Unserviceability of computers also affected the operational capabilities of the aircraft fleet. Due to high rate of unserviceability, computers worth Rs. 2.50 crores had to be imported;

— the data processing unit imported at a cost of Rs. 99.52 lakhs was lying unused since its receipt in August 1990; and

– expenditure of Rs. 75 lakhs incurred on import of nose wheel guards that became necessary due to design deficiency or material failures could not be recovered in the absence of contractual provision.

The Ministry stated (October 1992) that decline in serviceability was a result of a combination of factors which included high premature withdrawal rate of engines and non-availability of repair facilities. It was also stated that due to large number of engines and allied component failures, the utilisation of the aircraft had to be restricted and this resulted in shortfall in the performance.

APPENDIX II

CONCLUSIONS AND RECOMMENDATIONS

Sl. No.	Para No.	Ministry / Deptt. concerned	Conclusions / Recommendations
1	2	3	4
1.	53	Ministry of Defence	In order to fill the gap in the force level of Indian Air Force (IAF) and to enhance its operational capability the Government concluded a contract with aircraft manufacturers of a foreign country in September 1986, for procurement of certain number of twin-engined aircraft alongwith spares, related equipment, weapons and 32 spare engines at a total cost of Rs. 1,388 crores. The aircraft were received between 1986 and 1990 as scheduled and inducted into the squadron from 1987. Another contract for procurement of a few more aircraft with related equipment, weapons and 16 spares engines was concluded with the same manufacturers in February 1989 for raising another squadron, at a total cost of Rs. 821 crores. All the aircraft and equipments on order were received during 1990. The aircraft fleet was to be sustained till the turn of the century and the flying task approved by the Government for the aircraft fleet was 15 hours per aircraft per month for combat aircraft and 20 hours per aircraft per month for trainers. The Committee were informed that the selection of aircraft 'A' was guided by its operational advantages, cost effectiveness and the attractive conditions for payment on credit. The operational and technical aspects of the aircraft were evaluated by an Evaluation Team from the Ministry of Defence as per the Air Staff Requirement (ASR) formu-

1	2	3	4
			lated prior to the procurement of the aircraft. The flight evaluation revealed that in overall terms, the aircraft was amongst the best fighter aircraft available in the world at that time and was considered suitable for induction into Indian Air Force (IAF) as a dedicated air superiority fighter. The examination of the Audit paragraph has however, revealed certain disquieting aspects in the implementation of the contract for procurement of the aircraft 'A'.
2	54	-Do-	The Committee note that the engines for the aircraft were imported in two batches—the first batch called series-I having a total life of 300 hours before overhaul (TBO) and the second called Series-II with a life of 350 hours before overhaul. However, out of the total 188 aero-engines procured for the aircraft fleet, 158 aero-engines were prematurely withdrawn due to defects till 31 March, 1993. Consequently, an additional expenditure of Rs. 146.70 crores involving outflow of foreign exchange had to be incurred for rectification of these engines which had been withdrawn before completion of the prescribed time before overhaul. What has further concerned the Committee is that as many as 86 out of the 158 aero-engines had been withdrawn prematurely even before completion of 50% of the prescribed life before overhaul. The two main causes attributed to the premature withdrawals of the aero-engines where engines had not completed 50% of the prescribed time before overhaul were: (a) Nozzle Guide Vane (NGV) cracks and (b) damage due to Foreign Object Ingestion (FOD). Though the Ministry of Defence had maintained frequent failure of Nozzle Guide Vane as a design deficiency necessitating repairs free of cost, the contention could not carry conviction with the suppliers. The suppliers also did not accept the same claim of the Ministry in respect of FOD problem which they termed as an "operational

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			improvement". Eventually the Ministry had to incur an additional expenditure of Rs. 75 lakhs on fitment of nose wheel guards to the engines prematurely withdrawn due to FOD problem. Surprisingly, the contract executed with the suppliers did not contain any provision to protect the Government's interests in such eventualities. The Ministry of Defence were unable to offer any convincing explanation for the non-inclusion of any suitable clause in the contract which would have safeguarded their interests against such deficiencies/defects in the design and manufacture of the aircraft. The Committee are, therefore, led to conclude that the contract was not sufficiently detailed particularly in view of the fact that the Government had procured a state-of-art aircraft which was of recent origin and lacked adequate field experience.
3.	55	Ministry of Defence	Apart from the reasons cited above, engines of aircraft 'A' had also to be withdrawn due to other defects which necessitated repair/overhaul. The Committee note that in all as many as 185 engines had been repaired and overhauled so far; 35 engines were presently with the manufacturers for repair/overhaul and 36 were further awaiting despatch. During evidence, the Secretary, Ministry of Defence admitted that there had been long delays of two to three years in getting back the engines after repair/overhaul. As per the information made available to the Committee an expenditure of Rs. 195 crores had been incurred for repair/overhaul of aero-engines/aggregates. The Committee have been informed that an expenditure amounting to Rs. 92.5 crores is further expected to be paid to the manufacturers for repair/overhaul. It is evident from the facts stated above that aircraft 'A' fleet had been giving extensive problems in operation and maintenance since its induction which is a matter of great concern to the Committee. They desire that action should be

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			taken expeditiously for obtaining back the engines promptly after repair/overhaul so that serviceability of the aircraft is not affected adversely any further. The Committee would like to be informed of the latest position in respect of the number of engines awaiting despatch/return to/from the manufacturer and also the expenditure incurred on the repair/overhaul and on spare parts for the aircraft.
4.	56	-Do-	The cumulative effect of premature failure of engines due to design and other defects and the related problems had been that there was considerable shortfall in the performance of the aircraft fleet. As against the target of 75%, the actual serviceability of the aircraft during the years 1992-94 varied between 54.9 and 59.7 percents. The present utilisation rate of the aircraft fleet is 7 hrs. per month as against 15 hrs./20 hrs. per month as authorised by the Government. While maintaining that the utilisation rate, referred to the maximum hours authorised to fly and that there was no restriction on flying lesser hours, the Ministry of Defence attributed the shortfall in serviceability of the aircraft apart from premature failure of engines to problems arising out of non-availability of avionic aggregates and repair facilities in the country, extremely poor product support due to the changed environment pevailing in the manufacturing country etc. The Committee feel perturbed that despite the enormous money spent on induction and the additional expenditure incurred on design and other rectifications, the aircraft has failed in performance in terms of the targetted serviceability resulting in restricting the flying efforts and thereby compromising with the operational and training commitments.
5.	57	Ministry of Defence	The Ministry of Defence have assured the Committee that they have taken a series of measures for improving the serviceability of the

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			aircraft. These included increasing the degree of indigenisation of spares, execution of new contracts/agreements with other countries for improving the product support, setting up of specially empowered task forces in the Ministry etc. According to the Ministry, these steps have improved the support and spares availability over the last two years. The Committee desire that the Ministry of Defence should take appropriate steps to further improve the serviceability of the aircraft and would like to be apprised of the latest level of serviceability of the aircraft as well as the utilisation rate.
6.	58	-Do-	It is further disquieting to note that though the contract for procurement of the aircraft was concluded in September 1986 and it was expected that the first engine of the aircraft would be due for overhaul by 1989, no repair facilities had been established for repair/overhaul of the aircraft and its engines. Due to mis-match, four repair contracts for repair/overhaul of 156 engines at a cost of Rs. 180.49 crores were concluded with the manufacturers during a short span of one and a half years i.e. during July 1990 to January 1992. In the absence of repair/overhaul facilities, the engines continued to be despatched to the suppliers and as pointed out earlier, an expenditure to the tune of Rs. 195 crores had already been incurred on repair/overhaul of engines and aggregates and an expenditure amounting to Rs. 92.5 crores is expected to be incurred further on this count. The Ministry of Defence have contended that the repair/overhaul facilities were not planned simultaneously with the induction of the aircraft as need for it would have arisen only after adequate exploitation of the aircraft in service which in this case is 300 hrs./6 years for Series-I engine and 350 hrs./8 years for Series-II engines and the facilities thus created would have remained idle/grossly under-utilised for many years. They, however, admitted that in hind-

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			sight it may appear that planning of repair/ overhaul facilities alongwith induction of aircraft may have been advantageous. But according to them, at that time there were no indications that the manufacturing country would break up in near future and that their earlier experiences with induction of their aircraft had not given any cause for alarm. Keeping in view the strategic and other operational necessities which influenced the decision for selection of the aircraft 'A' and the level of expenditure incurred on its acquisition, the Committee are of the considered view that the decision not to plan indigenous repair/overhaul facilities simultaneously with the induction of the aircraft was not in the best interest of the country.
7.	59	Ministry of Defence	The Committee note that the contract for setting up of repair/overhaul facilities was signed only in August 1991 and as per the present target, the repair facilities involving an expenditure of about Rs. 247 crores would be available by 1996 only. Till that time, the engines obviously would continue to be despatched to the manufacturers abroad for repair/ overhaul at a considerable cost. Significantly, this would also increase the turn round time and reduce considerably the availability of the fleet. Ironically, by the time the facilities are set up, more than 50% of the total technical life (TTL) of most of the aero-engines (800 hrs./8 years) would have been completed and some of the engines may approach their total technical life by the end of 1996. The Committee recommend that all concerted efforts should be made by the Ministry for expeditious completion of the indigenisation project for repair/overhaul and apprise the Committee of the precise progress made. They further recommend that in future while negotiating such main contracts Government should also try to finalise the contracts for transfer of technology simultaneously so as to

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			avoid the type of difficulties experienced in the present case.
8.	60	-Do-	The Committee's examination has further revealed that non-availability of radar components had resulted in the grounding of seven aircraft for a period of over two years. The Ministry have attributed non-availability of these components to inadequacy of product support from the suppliers. They further stated that offers were also not forthcoming from the suppliers for repairs of these components. The Committee are of the opinion that proper advance planning by the Government of adequate reserves of the spares could have definitely prevented the grounding of the aircraft for a prolonged period and its consequential impact on training and operational commitments. Unfortunately, such prudence on the part of the authorities concerned was missing. The Committe, therefore, recommend that proper planning be made by the Ministry to obviate such lapses in future.
9.	61	Ministry of Defence	Two sets of flight data ground processing unit costing Rs. 99.52 lakhs each were procured by the Government from the manufacturers under the contract of February 1989. The Committee have been surprised to find that one of these units became unserviceable during warranty period and is still lying unutilised. Although a provision existed in the contract to either repair or replace the defective components, the suppliers failed to meet the same despite the issue being raised at Governmental level. The Ministry of Defence pleaded that since the contracts were not strictly commercial in nature due to special relationship with the suppliers no penalty clause existed to safeguard against breach of such conditions in the contract. The Committee are constrained to point this out as yet another area where Government had to suffer heavily due to the glaring inadequacies in the contrac-

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			tual provisions. While deprecating such a state of affairs, the Committee recommend that all possible steps should be taken by the Government to obviate such recurrences in future.
10.	62	Ministry of Defence	The aircraft 'A' fleet was initially planned to be sustained till the turn of the century. However, according to the Ministry, there is a scope of sustaining the squadrons upto 2003 with reduced Utilisation Rates (UR), reduced Strike Off Wastage (SOW) and Maintenance Reserve (MR), the possibilities of which would be further explored. Besides a proposal for acquisition of certain numbers of additional aircraft are stated to be under the consideration of the Government which if procured will help in sustaining the present fleet for a few more years. The Committee would like to be apprised of the progress made in this regard.
11.	63	-Do-	From the facts stated in the foregoing paragraphs, the Committee are inclined to conclude that the execution of the contract for procurement of aircraft 'A' has not been satisfactory. While explaining the difficulties encountered by them in this regard, the Ministry of Defence stated that the contract concluded for supply of aircraft 'A' stipulated that the suppliers were to provide spares and other equipment as well as repair/overhaul facilities for 10 years from the date of delivery. However, the clause was not honoured by the suppliers to the Ministry's satisfaction. According to the Ministry, due to the special relationship with the suppliers, the contracts were not strictly commercial in nature. However, with the changed environment and introduction of market economy in that country safeguards to protect our interests will be incorporated in future contracts to the extent possible. The Defence Secretary stated in evidence that a comparative study of other contracts in relation to one parameter, i.e. foreign object

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			damage revealed that engine withdrawals had the worst record in the case of aircraft 'A' until the defects were subsequently rectified. He also assured the Committee to examine the need for tightening the provisions in respect of future contracts. The Committee recommend that in the light of the experience in the induction of aircraft 'A', all possible corrective/remedial steps should be taken to prevent occurrence of such difficulties in future with a view to ensuring that the defence requirements are met timely, effectively and without any compromises and incurring of extra expenditure of sizeable magnitude as in the present case is avoided.

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