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Report of the Comptroller and Auditor General of India

for the year ended March 1998

Union Government (Defence Services)
Air Force and Navy
No. 8 of 1999

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PREFATORY REMARKS

This Report for the year ending March 1998 has been prepared for submission to the President under Article 151 of the constitution. It relates mainly to matters arising from test audit of the financial transactions of Ministry of Defence, Air Force, Navy, Coast Guard and associated Defence Research and Development Organisation. Results of audit of Ministry of Defence, in so far as they relate to Army and Ordnance Factories, Army HQ, Ordnance Factory Board, field units of Army, Ordnance Factories, associated Research and Development units and Military Engineer Services have been included in Report No. 7 of 1999.

The Report includes 23 paragraphs and reviews on (i) Development of an Airborne system (ii) Light Combat Aircraft and (iii) Naval Dockyard, Mumbai.

The cases mentioned in the Report are among those which came to notice in the course of audit during 1997-98 and early part of 1998-99 as well as those which came to notice during earlier years, but could not be included in the previous Reports.

OVERVIEW

The total expenditure of Air Force and Navy including capital expenditure, during 1997-98 was Rs 9300 crore and Rs 4814 crore respectively which together represents 38.69 *per cent* of the total expenditure of Rs 36479 crore on Defence Services.

Some of the major findings arising from test audit of transactions of Air Force, Navy, Coast Guard and associated Research and Development Organisation included in the Report are mentioned below:

I Light Combat Aircraft

- The then existing fleet of combat aircraft in 1980's was expected to deplete significantly during 1990s due to phasing out of the ageing aircraft. Government approved a project for design and development of a Light Combat Aircraft in 1983, which could replace a major portion of the ageing aircraft in the 1990s. Even at the end of 1998, it had not crossed the development stage. Its production and induction into the Air Force remain only a distant possibility. The development project is behind schedule by over eight years.

- The development of the airframe by Aeronautical Development Agency Bangalore and 'Kaveri' engine by Gas Turbine Research Establishment Bangalore have been delayed badly. The technology demonstrator was expected to be flown sometime during 1999 and the final clearance is not expected before 2005. Thereafter, the time taken to establish production facility is likely to take the induction further beyond 2005.

- Indigenous development of vital sub-systems viz. multimode radar, flight control system and digital engine control system were also behind schedule, despite engagement of foreign consultants.

- The airframe developed by Aeronautical Development Agency is deficient in vital parameters of aerodynamic configuration, volume and most importantly, the weight.

- Due to delay in development of Light Combat Aircraft the Air Force was compelled to embark on upgradation of MiG Bis aircraft at Rs 2135 crore.

- The estimated cost of Rs 2188 crore of Phase-I has already overshot the estimated cost of Rs 560 crore by about four times. Phase-II had not yet been sanctioned.

(Paragraph 28)

II Development of an Airborne system

Indigenous development of ASP[1] on rotodomed aircraft being pursued as a part of Airborne Early Warning programme, has been delayed by over three years. Projects relating to core activity areas

[1] Airborne Surveillance Platform

considered vital for design and development of the ASP have fallen behind with no amount of certainty about their expected date of satisfactory completion.

Air Force has now proposed import of AWACS[2] based on phased array system. Therefore, the utility of the ASP under development, based on rotodome approach even if successfully developed by the turn of the century, may not be of much utility. ASP under development fell short of the projected endurance, speed, altitude and detection range. However, while undergoing flight trials in January 1999 it crashed.

(Paragraph 27)

III Naval Dockyard, Mumbai

Naval Dockyard Mumbai is responsible for maintenance and refit of Naval ships. The performance of the Dockyard in refits was far from satisfactory. This resulted in lower operational availability of ships to Navy besides blocking of scarce dry docking space rendering other ships due for refits non-operational or compelling Navy to use them without the scheduled refits. Besides, non-availability of ships due to longer refit time, it entails extra expenditure also. Analysis by Audit disclosed an extra expenditure of Rs 27.83 crore during1992-97.

Only 28 refits out of 123 undertaken during 1992-97 were completed within the scheduled time while in 27 of them the time of refit exceeded the scheduled time by over 100 *per cent*.

Indecisiveness and uncoordinated approach led to delay in construction of the new dry dock, for which only 30.5 *per cent* progress had been made in 13 years. Thus, while on one hand the dry dock space is a major constraining factor for refits, even the approved dry dock had been considerably delayed. The existing five dry docks were also not utilised optimally. 19 *per cent* of the available dry dock ship-days were not used by the Naval Dockyard.

(Paragraph 18)

IV Delay in provision of air surveillance system

A critical defence requirement of SIGINT airborne surveillance system, used for gathering information on enemy radar and communication systems, projected by Air Force in 1987 for installation on aircraft by March 1990, had not been met as of January 1999. The Ministry sanctioned the development project in October 1989 for delivery of first system by October 1992. Indigenous development jointly by Defence Electronics Research Laboratory Hyderabad, Bharat Electronics Limited Hyderabad and HAL[3] overshot the scheduled time by six years.

Even after the successful trials in July-September 1992, the Ministry delayed obtaining approval of the Cabinet Committee on Political Affairs by 20 months. Meanwhile, Air HQ unauthorisedly appropriated the two Boeing 737 aircraft purchased for installation of this system to VIP squadron, the misuse of which was commented upon in the Report of Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1997, No. 8 of 1998.

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[2] Airborne Warning and Control System
[3] Hindustan Aeronautics Limited

Air HQ positioned the first Boeing aircraft as back as July 1995, while the second was positioned in January 1998 for installation of the system. The installation etc. were yet to be completed. In the intervening time, the Air Force was compelled to depend upon the existing AVRO based system, which was considered outdated, way back in 1987.

(Paragraph 7)

V Delay in testing of missiles

Ministry imported missiles and test equipment at Rs 37.86 crore and Rs 1.03 crore respectively in January 1996. But Air HQ/ Ministry failed to upgrade the test facility in time due to non-inclusion of services of foreign specialists for upgrading the test facility in the purchase contract. On testing, after over two years of import, missiles worth Rs 3.41 crore were found unserviceable. Thus, due to the lack of foresight of the need for services of foreign specialists for upgrading test facility, the Air Force was saddled with missiles of uncertain reliability for 28 months until these were tested in May 1998. The warranty replacement of the missiles valued at Rs 3.41 crore was uncertain, since the suppliers warranty was limited to 12 months from the date of delivery.

(Paragraph 8)

VI Misuse of gymnasium

Despite an expenditure of Rs 69 lakh on construction of an additional gymnasium, sailors and officers of Eastern Naval Command were deprived of gymnasium facilities. FOC-in-C[4] ordered its use as an "integrated welfare complex" for running restaurant, bank, ice-cream parlour, beauty parlour, creche, computer education centre and saloon etc. The income generated from rent was being unauthorisedly diverted to a non-Government account. The unauthorised appropriation of the assets created out of Government funds calls into question the propriety of use of delegated powers by FOC-in-C Eastern Naval Command.

(Paragraph 19)

VII Acquisition of advanced off shore patrol vessels

Lackadaisical management of the plan for acquisition of advanced off shore patrol vessels by Coast Guard and tardy execution by Goa Shipyard, resulted in supply of only two vessels in 1995 and 1997 without a proved weapon package against planned induction of three vessels in May 1993, February 1994 and November 1994. The third vessel had not been supplied so far.

(Paragraph 25)

VIII Delay in sanctioning additional Bulk Petroleum Installation

The construction of additional bulk petroleum installation sanctioned by the Ministry in February 1991 at Rs 2.66 crore was to be completed by March 1995, for storage of aviation fuel to meet one month's operational requirement at an important Air Force station. The progress of

[4] Flag Officer Commanding-in-Chief

construction of the bulk petroleum installation betrayed lack of seriousness on the part of Air HQ, Ministry and IOC[5] to this crucial requirement. The project is delayed by at least six years due to selection of wrong site, repeated revision of the estimates by IOC delay in issue of revised sanction and release of funds.

(Paragraph 10)

IX Non-functional Electro Optical Tracking and Computing equipment

An Electro Optical Tracking and Computing equipment imported in 1985 at Rs 2.60 crore for evaluation of trajectory of weapons released from aircraft, was made functional after seven years in December 1992 after repairs. However, even thereafter, persistent snags in the equipment compelled the Air Force to use less reliable methods during the last 14 years. Due to continued unserviceability of the equipment, no fixed tasks were allotted to the unit specially set up for managing this equipment. Meanwhile, 15 officers / airmen deployed at the centre to operate the equipment had practically no work.

(Paragraph 9)

X Overpayment to a foreign firm

Failure of Air HQ to detect the short receipt of two items obvious from the scrutiny of the invoice and other shipping documents resulted in delay in raising the discrepancy report, beyond the stipulated period of 90 days and consequential loss of Rs 70 lakh.

(Paragraph 14)

XI Under-utilisation of aircraft simulator

An aircraft simulator procured for Rs 5.42 crore for an Air Force unit has remained largely unserviceable despite provision of Constant Voltage Constant Frequency System and battery bank at Rs 20.77 lakh and repairs at Rs 72.75 lakh. In the absence of the Simulator, the trainee pilots were imparted training by conventional method and by providing additional sorties on trainer and fighter aircraft . The Ministry has not replaced the ageing Simulator or upgraded the hardware/software despite its persistent unserviceability.

(Paragraph 13)

XII Award of fabrication of torpedo carriers to a firm under liquidation

Naval HQ negligently entrusted the fabrication of torpedo carriers to Usha Atlas Hydraulic Ltd. Calcutta that was under liquidation since 1992. Naval HQ delivered five chassis costing Rs 60.74 lakh to the firm in September 1996 for fabrication. The chassis remained unattended in the custody of the firm which caused deterioration in their condition. The firm had finally gone into liquidation in December 1996. The chassis will have to be accepted on "as is where is basis."

(Paragraph 23)

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[5] Indian Oil Corporation

XIII Failure to obtain supply of critical armament stores

Failure of Air HQ to get the validity of credit agreement with a foreign country extended beyond December 1996, resulted in non-supply of two critical armaments required for training commitments of Air Force besides idling of advance payment of Rs 40.61 lakh since September 1994. The non-availability has adversely affected the armament training of the Air Force.

(Paragraph 15)

XIV Non-utilisation of workshop building

The Ministry sanctioned creation of workshop facilities for repair of Dornier aircraft of Coast Guard in August 1990 at an estimated cost of Rs 46 lakh. However, the additional power supply, false ceiling and PVC flooring etc. as recommended by the Board of Officers were not included in the sanction. These were separately sanctioned by the Coast Guard HQ. As a result, the workshop building completed in July 1993 at Rs 47.41 lakh had not been put to use for the intended purpose and the Coast Guard had to incur an expenditure of Rs 1.40 crore on off-loading Super Marec radar to Hindustan Aeronautics Limited for repairs.

(Paragraph 26)

XV Delay in recovery of replacement cost of a helicopter from ONGC

The delay by Air HQ in raising the claim and furnishing the copy of enquiry report to ONGC[6] in respect of an Air Force helicopter destroyed in accident in 1992, while transporting ONGC personnel, led to non-recovery of its replacement cost of Rs 6.36 crore.

(Paragraph 12)

XVI Recovery at the instance of Audit

Accounts Officer, Defence Accounts Department (HAL)[7] recovered Rs 2.07 crore from HAL during August 1996 and August 1998 at the instance of Audit.

(Paragraph 17)

XVII Response of the Ministries/ Departments to Draft Audit Paragraphs

As per the Government instructions issued at the instance of Public Accounts Committee the Ministries are required to send their response to the Draft Paragraphs forwarded demi officially to the Secretaries within six weeks. Defence Secretary did not send response to eight paragraphs included in this Report.

(Paragraph 5)

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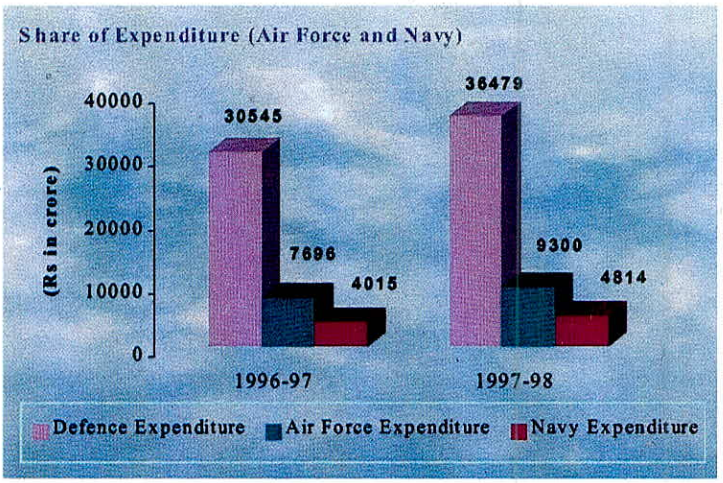
[6] Oil and Natural Gas Commission
[7] Hindustan Aeronautics Limited

CHAPTER I : FINANCIAL ASPECTS

1 Financial Aspects

1.1 The total revenue and capital expenditure on Defence Services during 1997-98 was Rs 36479 crore, which was 19.43 *per cent* higher than the 1996-97. The share of the Air Force and the Navy in the total expenditure on Defence Services in 1997-98 was Rs 9300 crore and Rs 4814 crore respectively including capital acquisition. The expenditure on Air Force and Navy was 20.84 *per cent* and 19.90 *per cent* more than the expenditure during the preceding year.



1.2 The distribution among major areas of expenditure like capital acquisition, stores, pay and allowances and works etc., during 1997-98 in Air Force and Navy is shown in the table below:

	AIR FORCE		NAVY	
	Rs in crore	per cent	Rs in crore	per cent
Capital Acquisition	3847	41.37	2225	46.22
Stores	3255	35.00	972	20.19
Pay and Allowances	1555	16.72	896	18.61
Works	481	5.17	346	7.19
Other expenses	162	1.74	375	7.79
Total	**9300**		**4814**	

1.3 Test check of various transactions and review of certain projects/activities relating to Air Force and Navy revealed instances of injudicious planning, delay in decision making, weaknesses in project implementation and cost and time overruns in creation of facilities etc.

1.4 An amount of Rs 2.07 crore was recovered at the instance of Audit during the year. In addition, unauthorised works sanction for Rs 72.73 lakh was cancelled at the instance of Audit.

Chapter II : MINISTRY OF DEFENCE

2 Non-recovery of liquidated damages

Accounts Officer, DAD (HAL), Hyderabad failed to recover Rs 6.43 crore towards liquidated damages from BDL.

Army HQ placed an indent in March 1995 on BDL[1], Hyderabad for supply of 2000 Konkur missiles at a total cost of Rs 65 crore. The missiles were due to be delivered by March 1996. Any delay in delivery of the missiles attracted liquidated damages at the rate of half a *per cent* per week. In compliance to the Ministry's orders, the Accounts Officer, DAD[2] (HAL), Hyderabad paid 85 *per cent* advance aggregating Rs 50.60 crore to BDL in March 1995. However, BDL supplied only 1156 missiles up to March 1996. The Ministry extended the delivery period up to March 1997 for the balance, subject to a decision on imposition of the liquidated damages. BDL completed the supply of balance 844 missiles during February and April 1997.

Extension of delivery was granted subject to decision on imposition of liquidated damages.

The Accounts Officer released the final payment to BDL in July 1997 without obtaining the decision of the Ministry on imposition of liquidated damages of Rs 6.43 crore. The Ministry's decision on payment of liquidated damages was awaited as of December 1998.

Accounts Officer made the final payment to BDL without obtaining decision from the Ministry.

The matter was referred to the Ministry in August 1998; the reply was awaited as of January 1999.

3 Idling of funds and loss of interest

Remittance of funds by the Naval HQ and Air HQ to the Naval/Air Adviser in the High Commission of India at London far in excess of requirement resulted in loss of interest of Rs 3.50 crore.

Scrutiny of records of the HCI[3] at London revealed that the Naval Adviser to the HCI had received funds aggregating £ 2994716 during March 1991 to March 1995 for payments against the contracts for repair of equipment and also for purchase of small value spares. Similarly, Air HQ had remitted £ 144725 in December 1991 to the Air Adviser to the HCI. The pace of utilisation of funds, as shown in the following table, clearly indicated that these were remitted without proper assessment of the requirement resulting in unnecessary idling of the amount.

Funds aggregating £ 2994716 and £ 144725 were remitted to Naval/Air Adviser to HCI London without proper assessment of requirements.

[1] Bharat Dynamics Limited
[2] Defence Accounts Department
[3] High Commission of India

Accounts with Naval Advisor

(in pounds sterling)

Year	Opening balance	Receipt	Payments	Closing balance
1990-91	Nil	191282	13619	177663
1991-92	177663	531125	92651	616137
1992-93	616137	2240912	577319	2279730
1993-94	2279730	0	1330929	948801
1994-95	948801	31397	779827	200371
1995-96	200371	0	3061	197310
Total		2994716	2797406	

Accounts with Air Advisor

(in pounds sterling)

Year	Opening balance	Receipt	Payments	Closing balance
1991-92	Nil	144725	13313	131412
1992-93	131412	Nil	38539	92873
1993-94	92873	Nil	10746	82127
1994-95	82127	Nil	27453	54674
1995-96	66181#	Nil	66167	14

Balance as intimated by the Director of Accounts to the Air HQ in April 1995. The discrepancy of £11507 had not been reconciled by the Air Adviser.

The funds were placed in a non-interest bearing current account.

Government of India ran a fiscal deficit of Rs 36325 crore to Rs 60244 crore during 1991-92 to 1995-96 which were met through borrowings at the maximum rate of interest of 14 *per cent.* Thus, any amount kept outside the Consolidated Fund had interest cost. Retention of the excess balances with Naval Adviser and Air Adviser in non-interest bearing account outside the Consolidated Fund of India cost the public exchequer Rs 3.50• crore by way of interest. Had the excess funds been kept in roll-over fixed deposits of one month maturity instead of in a non-interest bearing current account at least Rs 1.40• crore could have been earned by way of interest.

Excess remittance had interest impact of Rs 3.50 crore.

The Ministry stated, in September 1998, that public funds are always operated through current account and no interest accrues on them.

The contention of the Ministry is not tenable. Firstly, the Ministry ought to have restricted the remittance for imprest to the amount necessary for immediate requirement. The large sums shown as closing balances for five years would reveal that the Ministry remitted amounts far in excess of such

• 1 £ = Rs 66.93

requirement. As mentioned above, keeping such amounts in non-interest bearing account outside the Government account for four years is to be viewed in the larger context of a part of the expenditure being met out of borrowed funds at the maximum rate of interest of 14 *per cent.*

The Ministry should streamline the system of such remittances and establish accountability for lapses.

4 Non-recovery of airlift charges

Airlift charges for special flight between New Delhi and Thiruvananthapuram permitted for Shri A.K. Antony, Chief Minister designate of Kerala in March 1995 by the Prime Minister remains unrealised for more than three and a half years.

Mention was made about misuse and arbitrary use of the fleet of aircraft of the VIP squadron maintained by the Ministry and systemic deficiencies in management and control of the use of aircraft in paragraph No. 2 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1997, No. 8 of 1998.

Further test check of utilisation of aircraft and settlement of bills disclosed that Shri A.K. Antony, the then Chief Minister designate of Kerala was provided an airlift in a special flight in Boeing 737 aircraft of VIP squadron from New Delhi to Thiruvananthapuram on 21 March 1995 on telephone orders from the Prime Minister's Office. The bill for Rs 14.69 lakh for use of this special flight has been repudiated by the Government of Kerala even while having accepted it in the first instance.

The Note of Prime Minister's Office dated 21 March 1995 conveying Prime Minister's approval for provision of Boeing 737 aircraft to carry Shri A.K. Antony from New Delhi to Thiruvananthapuram was received in the Ministry on 23 March 1995, two days after the special flight was provided. The Ministry issued orders to Deputy Director (Operations) after another six days on 29 March 1995.

Scrutiny of documents further disclosed that while the approval of Prime Minister was for special flight to Shri Antony only, six members of Parliament, one along with his spouse also made use of this special flight. The aircraft returned to the base on the same day after flight duration of six and a half hours.

The bill of Rs 14.69 lakh for this journey was raised by Air HQ on Government of Kerala in June 1995. The State Government initially accepted the claim and issued formal sanction in February 1996 for payment of airlift charges. In a *volte-face*, however, the State Government subsequently informed Air HQ in

March 1997 that the payment would not be made from the state exchequer and the amount should be realised directly from Shri Antony, the leader of the opposition in Kerala Legislative Assembly. The State Government reiterated, in October 1997, that since Shri Antony was only a Chief Minister designate on the day of the special flight and the flight undertaken did not serve any public interest, they were not in a position to make the payment. The State Government added that they were not aware of any understanding reached between the then Prime Minister and the State Government.

The Ministry stated, in September 1998, that Prime Minister's Office had been approached for directions to State Government for expediting settlement of pending airlift bill.

5 Response of the Ministries/Departments to Draft Audit Paragraphs

On the recommendations of the Public Accounts Committee, Ministry of Finance (Department of Expenditure) issued directions to all ministries in June 1960 to send their response to the Draft Audit Paragraphs proposed for inclusion in the Report of the Comptroller and Auditor General of India within six weeks.

The Draft Paragraphs are always forwarded by the respective Audit Offices to the Secretaries of the concerned ministries/departments through Demi Official letter drawing their attention to the audit findings and requesting them to send their response within six weeks. It was brought to their personal notice that since the issues were likely to be included in the Audit Report of the Comptroller and Auditor General of India, which are placed before Parliament, it would be desirable to include their comments in the matter. Draft Paragraphs/Reviews proposed for inclusion in the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended March 1998, No. 8 of 1999 were forwarded to the Secretary, Ministry of Defence between May 1998 and December 1998 through Demi Official letters.

The Secretary, Ministry of Defence did not send replies to eight Draft Paragraphs/Reviews in compliance to above instructions of the Ministry of Finance issued at the instance of the Public Accounts Committee out of 26 Paragraphs/Reviews included in this Report. Thus, the response of the Secretary of the Ministry could not be included in them.

Ministry/ Department	Total No. of Paragraphs on the Ministry/ Department included in the Report.	No. of Paragraphs in which reply not received from Secretary, Ministry of Defence.	Paragraph Numbers
Ministry of Defence	26	08	2, 18, 19, 21, 22, 23, 25 and 26

6 Follow up on Audit Reports

Despite repeated instructions/recommendations of the Public Accounts Committee, the Ministry did not submit remedial Action Taken Notes on 54 Audit Paragraphs.

Action Taken Notes are to be submitted within four months of placing the Report on the Table.

In their Ninth Report (Eleventh Lok Sabha) presented to the Parliament on 22 April 1997, the Public Accounts Committee desired that Action Taken Notes on all paragraphs pertaining to the Audit Reports for the year ended 31 March 1996 onwards be submitted to them duly vetted by Audit within four months from the laying of the Reports in Parliament.

The Ministry failed to submit Action Taken Notes on 54 paragraphs.

Review of outstanding Action Taken Notes on paragraphs included in the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) as of January 1999 revealed that the Ministry of Defence failed to submit Action Taken Notes on 54 paragraphs included in the Audit Reports up to and for the year ended March 1997 as per Appendix-I & II enclosed. It was also noticed that in four cases (Sl. No 1, 2, 10 and 18 of Appendix-I), the Ministry did not respond to the vetting comments of Audit for over one to five years.

The Ministry stated, in October 1998, that the Defence Secretary had issued instructions to concerned wings for early finalisation of Action Taken Notes on pending Audit Paras and that a regular monitoring mechanism had been instituted to watch the progress. It added that periodical meetings taken by the Senior Officers of the Ministry had yielded good results and that a number of Audit Paras had been cleared.

The fact, however, remains that as of January 1999, the Ministry failed to submit Action Taken Notes even on the 27 paragraphs pertaining to Audit Reports for and up to the year ending March 1996.

Chapter III : AIR FORCE

Acquisition

7 Delay in provision of air surveillance system

Delays at all stages of decision making coupled with delay in development of the SIGINT air surveillance system considered as vital way back in 1990 have led to this important system not being available to the Air Force until at least April 1999.

Air HQ proposed import of three SIGINT systems for replacing outdated systems by March 1990.

Airborne SIGINT system is an electronic surveillance system capable of collecting information about enemy radar systems as well as about their communication systems. Air HQ projected an immediate operational requirement of three such systems with state of the art technology in June 1987 for replacing its existing HS-748 based systems which had become outdated to match the changed threat scenario. Two of these systems were proposed to be installed on Boeing 737 aircraft for airborne use while the third was meant for reserve and training. Because of limited requirement and long gestation period of indigenous development, Air Force suggested their import, at the then total cost of Rs 30 crore for all three systems so that these were available for installation on the aircraft latest by March 1990.

Indecisiveness in the Ministry delayed sanction of indigenous development of SIGINT by two and a half years.

The Ministry, however, opted for indigenous development on the ground that Defence Research and Development Organisation had expertise in the field and accorded "go-ahead" sanction in October 1989 for indigenous development of the system by Defence Electronics Research Laboratory, Hyderabad with BEL[1], Hyderabad and Hindustan Aeronautics Limited. The unintegrated system was to be demonstrated by April 1991 and the first airborne system, duly integrated on aircraft, was to be delivered by October 1992. The Ministry thus, delayed sanction of indigenous development by two and a half years.

The development project overshot the schedule time by 17 months.
The conclusion of contract with BEL for supply of this system took another 10 months.

The development of the system suffered from delays. A joint team of Air Force, BEL and Defence Electronics Development Establishment evaluated the system during July-September 1992, after a delay of more than 17 months from the originally scheduled date. While the proposal was under process in the Ministry for approval of CCPA[2] for acquisition of the three systems from BEL, two Boeing 737 aircraft were procured from Indian Airlines in July 1993 at Rs 16.50 crore. Approval of the CCPA was obtained only in May 1994, after a delay of 20 months from the successful trial. Thereafter, it took 10

1 Bharat Electronics Limited
2 Cabinet Committee on Political Affairs

months to conclude the contract with BEL, who was assigned the task of manufacture, for supply of three airborne systems in March 1995.

The installation of the system was delayed due to late positioning of the aircraft.

According to the time schedule indicated in CCPA paper, the first system was to be made operational in 1995-96, the second in 1996-97 and the third in 1997-98, BEL was also to carry out necessary structural modification of two Boeing 737 aircraft and install the system onboard through Hindustan Aeronautics Limited as sub-contractor, Rs100 crore was payable to BEL for the supply and services rendered, of which Rs 90 crore with a foreign exchange content of Rs 52.40 crore was for supply of the systems. However, Air HQ delayed positioning of the aircraft, although these had been purchased way back in July 1993. One aircraft was positioned in July 1995 and another in January 1998. The aircraft were unauthorisedly diverted to VIP squadron which already consisted of two Boeing 737, seven Avros and six helicopters. The Ministry attributed the delay in positioning of aircraft to non-availability of hanger space at Aircraft and System Testing Establishment. The Ministry ought to have provided additional hanger space for such an important project. Besides, purchase of the aircraft five years in advance without checking on the availability of hanger was not justified.

While the critical defence requirement suffered, both the aircraft were diverted to VIP squadron.

Thus, while a critical defence requirement suffered, the Ministry used the aircraft purchased for installing the system for providing air-transport to those, who were not even entitled for their use. Misuse of the aircraft of the VIP squadron was brought out in paragraph No.2 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1997, No. 8 of 1998.

The Ministry accepted that there were delays in development of the system. It added in October 1998 that it did affect the operational efficiency of the Air Force. They also added that some delays are inevitable in development projects of this magnitude and that unforeseen administrative/technical problems came up during the process of development.

The Ministry's stand underscores lack of seriousness towards controllable lapses and shortcomings leading to compromise in acquisition of vital defence systems/ equipment. While some delays in development due to factors beyond control would be understandable, the Ministry's position on inevitability of delays on administrative grounds at different stages brought out above and their silence on unauthorised diversion of aircraft purchased for installing the SIGINT system are not acceptable.

8 Delay in testing of missiles

Delay by Air Force to upgrade the test facility for testing of imported missiles left them with missiles of uncertain reliability for 28 months, besides, uncertainty about free replacement of unserviceable missiles valued at Rs 3.41 crore.

Missiles valuing US $12 million imported in January 1996 could not be tested for their effectiveness for over a period of two years in the absence of proper test facilities as discussed below:

The Ministry concluded a contract in February 1995 with a foreign firm for supply of missiles at US $ 12 million, equivalent to Rs 37.86 crore♠. The contract also provided for supply of an equipment valuing US $ 325 thousand, equivalent to Rs 1.03 crore required for upgrading the existing test facility for testing the missiles. The missiles and the test equipment were delivered in January 1996 and were received at the test site in February and March 1996. The firm guaranteed the missiles and the equipment for 12 months from the date of delivery and the missiles had a shelf life of eight years.

Air HQ/Ministry failed to include in the contract, services of foreign specialists required for upgradation of the test facility and training of Indian technicians. An additional agreement had to be concluded with the foreign firm in April 1996. Certain equipment for upgrading the test facility received under additional agreement were positioned at an Air Base in December 1997. The upgradation of the existing test facility was completed only in May 1998. Resultantly, the missiles imported in January 1996 could not be tested for over a period of two years since their receipt. In the meantime, the warranty for the missiles as well as for the test equipment expired in December 1996 itself.

The Ministry stated, in October 1998, that missiles were tested in May 1998 and 91 *per cent* were found serviceable. The Ministry added that they had requested the foreign firm to extend the warranty period up to December 1998.

Missiles valuing Rs 3.41 crore found unserviceable.

The net result of this deficiency in far-sightedness was that for 28 months the Air Force was saddled with these missiles of uncertain reliability since these were not tested and certified by them to be in a fit state. Besides, the warranty replacement of missiles valued at Rs 3.41 crore not found serviceable is uncertain, since the warranty period of 12 months had expired in December 1996 itself.

♠ 1 US $ = Rs 31.55

9 Non-functional Electro Optical Tracking and Computing equipment

Equipment imported at a cost of Rs 2.60 crore for evaluation of trajectory of weapons released from aircraft had never been utilised for its intended role ever since its receipt in 1985.

An Electro optical tracking and computing equipment imported at Rs 2.60 crore for evaluation of trajectory of weapons released from aircraft was made functional only after seven years of its receipt, but persistent snags in the equipment have never been rectified as of October 1998. As a result, Air Force was compelled to use less reliable methods for tracking the trajectory. The Ministry and Air HQ have failed to make this critical equipment functional even after 14 years of its receipt. The audit scrutiny of records in the Aircraft System Testing Establishment Bangalore, where a centre was created to maintain and operate the equipment, disclosed the following:

Manufacturers failed to demonstrate the capability of the equipment.

i. The manufacturers failed to demonstrate the capability of equipment imported in 1985 and went into liquidation. The successor firm accepted no liability. The equipment was made functional in December 1992 after repairs. However, due to persisting snags in the sub-systems, it could not be sustained in continuous serviceability state.

The equipment was accepted by an untrained officer.

ii. The acceptance trial of the equipment was witnessed and the equipment was accepted by an officer who was neither trained on the equipment nor was member of the acceptance team. Subsequently, on receipt in India, the equipment did not function as required. Even though, the Ministry had stated in April 1993 in their Action Taken Note on paragraph No. 6.8 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services(Air Force and Navy) for the year ended 31 March 1991, No.9 of 1992 submitted to the Public Accounts Committee that Air HQ would fix responsibility for the lapses, no responsibility was fixed.

The centre specially created was not allotted its fixed task.

iii. Due to continued unserviceability of the equipment no fixed task was allotted to the unit specially set up for managing this equipment. Staff deployed for the equipment was being utilised for preventive maintenance of the equipment. The use of the equipment was sub-optimal throughout.

The equipment imported in 1985 had never been put to use since its receipt.

iv. As of October 1998 the range of video camera in the equipment had reduced, computers were unserviceable and auto tracking function of the equipment was only partially serviceable due to accumulation of tracking errors leading to frequent breaks in tracking.

Thus, a critical requirement to track and analyse the weapon systems fired from the aircraft has remained unavailable to the Air Force for the last 14 years after it was first thought necessary.

Meanwhile, the Air HQ has maintained three officers and twelve airmen at the centre with practically no job.

The Ministry stated, in October 1998, that expertise was not available to tackle the problems in tracking control of the equipment and assistance of competent vendor was required to make it fully functional.

Works Services

10 Delay in sanctioning additional Bulk Petroleum Installation

Lackadaisical project approval management by Air HQ, the Ministry and IOC deprived the Air Force of much needed aviation fuel for one month's operation in place of the existing one week's requirement for over 6 years.

Failure of Air HQ and Engineer-in-Chief to obtain sanction of the Ministry in time coupled with selection of a wrong site and delay in release of funds to IOC[3], deprived the Air Force of uninterrupted fuel supply which was considered essential from operational and security point of view. This also resulted in escalation of cost from Rs 2.66 crore to Rs 6.72 crore.

A Board recommended construction of additional storage in 1989.

The bulk petroleum installation for aviation fuel at an Air Force station had a limited capacity which catered for only one week's requirement. Air HQ, therefore, decided to increase the capacity of the storage to meet one month's requirement for uninterrupted flying operations. A Board of Officers recommended in June 1989 construction of additional storage. The Ministry sanctioned provision of additional bulk petroleum installation at the station, in February 1991 at an estimated cost of Rs 2.66 crore. Works costing Rs 2.38 crore were to be executed by IOC as a deposit work. The work was to be completed by March 1995.

Air HQ/MES took 15 months in submitting the case to the Ministry.

However, IOC did not commence the work and revised the estimates to Rs 3.43 crore in March 1991. Air HQ and Engineer-in-Chief took 15 months and submitted the case to the Ministry only in June 1992 by which time the validity of estimates had expired. In the meantime, another Board convened in January 1992, proposed a new site as the site proposed by the earlier Board was in close proximity to the existing IOC storage.

[3] Indian Oil Corporation

Even after this change of site, the project management by Air HQ and the Ministry was tardy, resulting in repeated revisions of the estimate by IOC during 1992 to December 1996, when they last revised the cost to Rs 6.17 crore. The Ministry approved the revised project cost as late as in August 1997 at Rs 6.72 crore. Meanwhile, Air HQ had paid Rs 1.88 crore to IOC in March 1995.

IOC commenced the work in December 1995 and stopped in January 1997.

IOC commenced the work in December 1995 but stopped it in January 1997 on the ground that 75 *per cent* advance of finally sanctioned cost had not been paid to them.

The work was expected to be completed only in 2001.

Air HQ paid another instalment of Rs 2.65 crore to IOC in November 1997 and the work commenced in April 1998. It was expected to be completed by August 2001, against the original completion date of March 1995.

Thus, an essential operational requirement to provide for safe level of aviation fuel storage at an Air Force station, the need for which was felt way back in 1989 was expected to take another three years as of 1997-98.

The Ministry stated, in September 1998, that repeated upward revision of cost by IOC at short intervals had led to revision of sanction and this in turn led to deprivation of uninterrupted fuel supply.

Provisioning

11 Procurement of projectors at exorbitant rates

Purchase of overhead/slide projectors from NCCFI despite much lower rates prevailing in market resulted in extra expenditure of Rs 39.32 lakh.

Director of Engineering Support, Air HQ raised an indent in June 1995 for purchase of 14 items of training aids for units under Training Command Bangalore. The indent included overhead projectors with screen trolley part No. 108-1 (Catalogue No. 6730-70022) at Rs 13276 each quoted by US Enterprises, Bangalore and 35 mm slide projectors auto with slide frame, part No. 1601-12 (Catalogue No. 6775-000047) at Rs 13520 each quoted by the same firm. These rates were found reasonable by Board of Officers held at Training Command Bangalore.

The Ministry sanctioned the equipment at much higher rates than those recommended by Training Command.

This resulted in extra expenditure of Rs 39.32 lakh.

The Ministry sanctioned procurement of 146 overhead projectors with screen at a cost not exceeding Rs 44 lakh and 14 of 35mm slide projectors with slide frame at cost not exceeding Rs 16.80 lakh excluding sales tax through NCCFI[4]. The unit rate for overhead projectors and slide projectors worked out to Rs 30000 and Rs 1.20 lakh each respectively against Rs 13276 and Rs 13520 each recommended by Training Command.

The procurement of projectors at exorbitant rates from NCCFI as compared to the lower rates of US Enterprises Bangalore, resulted in extra expenditure of Rs 39.32 lakh in a purchase of Rs 60.80 lakh. Air HQ procured similar overhead projectors in November 1998 at the rate of Rs 8071.50 each and 35mm slide projector auto was available in September 1998 at the rate of Rs 16506 each.

The Ministry stated, in September 1998, that according to existing instructions all purchases of stationery and other items for Government are to be made from Kendriya Bhandar, Super Bazar, NCCFI. The Ministry added that the rates quoted by unapproved private agencies cannot be compared with that of the Government agencies.

The contention of the Ministry is not acceptable. It was incumbent upon the Ministry to question the *prima facie* exorbitant rate demanded by NCCFI, when they were aware of lower rate quoted by another firm. Besides, the interpretation of stationery and other items is also questionable, since it is not clear whether sophisticated equipment are covered under 'other items' in the Ministry of Personnel, Public Grievances and Pensions, Department of Personnel and Training OM No.14/1/88(Welfare/Vol.II) dated 11 April 1994 prescribing the policy of purchase of stationery and 'other items'.

Government should investigate the reasons for higher rates by NCCFI and review the existing instructions in the light of this case to specify the items which ought to be purchased from Kendriya Bhandar, Super Bazar, NCCFI etc., price preference and system of control over the price fixation by them.

[4] National Co-operative Consumers Federation of India

Miscellaneous

12 Delay in recovery of replacement cost of a helicopter from ONGC

Air HQ failed to recover Rs 6.36 crore towards replacement cost of a helicopter destroyed in accident while transporting ONGC personnel for about six years due to delay in raising the claim and furnishing copy of enquiry report to ONGC.

An Air Force helicopter in use for ONGC[5] met with an accident and was totally destroyed in 1992. Scrutiny of records revealed the lackadaisical attitude of Air HQ in initiating and pursuit of claim for the replacement cost of the helicopter. This led to non-recovery of Rs 6.36 crore from ONGC for about six years as discussed below :

- An Air Force helicopter, while transporting passengers of ONGC in November 1992 from Bombay High to Juhu, crashed due to mechanical failure and was totally destroyed. In the event of such a loss, the replacement cost of the helicopter is to be reimbursed in full by ONGC.

Air HQ intimated replacement cost of helicopter to ONGC after seven months.

- The Ministry assessed the cost of damage after taking into account the recommendations of Court of Inquiry held in November 1992 at Rs 6.36 crore in July 1993 and intimated the same to ONGC for reimbursement.

Air HQ furnished enquiry report to ONGC after 20 months of their request.

- As the claim was considered on the higher side by their Insurance Company, ONGC called for a copy of the enquiry report in March 1995, i.e. 20 months after raising the claim to substantiate it. Air HQ, however, made it available to ONGC only in November 1996, after another 20 months. They requested ONGC in March 1997 to pay the cost of the helicopter.

The survey was carried out in February 1998 but the claim is still outstanding.

- In September 1997, the surveyor of ONGC's Insurance Company wanted to survey the helicopter wreckage for assessment of cost. Air HQ advised ONGC in December 1997 to liaise with an Air Force station for this survey. The survey of the wreckage was carried out by Insurance agents in February 1998.

The Ministry stated, in October 1998, that the Insurance Company has accepted a claim amounting to Rs 1.90 crore which, however, was not acceptable.

[5] Oil and Natural Gas Commission

13 Under-utilisation of aircraft simulator

The injudicious decision of Air HQ to install Constant Voltage Constant Frequency System in lieu of uninterrupted power supply system affected the serviceability of the Simulator, which largely remained unserviceable during 1990-95 which, in turn, affected the training of the pilots.

Under-utilisation of a Simulator procured and installed at a unit at a cost of Rs 5.42 crore since its receipt was commented upon in paragraph No. 5.4 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1990, No. 9 of 1991. In their Action Taken Note, the Ministry had stated , in January 1992, that the Constant Voltage Constant Frequency System had since been installed and the Simulator made operational in September 1990. Audit examination of the case in June 1995 and subsequently revealed that the decision of Air HQ to install Constant Voltage Constant Frequency System was injudicious. Despite provision of Constant Voltage Constant Frequency System, battery bank and repair of the Simulator, it largely remained unserviceable, which adversely affected the operational training of the pilots, as discussed below:

The Simulator was operational only from July 1985 to November 1987.

The Audit Paragraph brought out in 1991 that the Simulator made operational in July 1985 started malfunctioning in November 1987 due to power fluctuation and pilots had to be sent to another station for training.

Against Board's recommendation for uninterrupted power supply, Constant Voltage Constant Frequency System was installed.

In order to prevent damage, the Simulator was switched off till a reliable power supply system was installed. A Board of Officers had recommended uninterrupted power supply system for stabilised power supply to the Simulator. However, in a meeting held at Air HQ in June 1989, it was decided to purchase a Constant Voltage Constant Frequency System. Constant Voltage Constant Frequency System was installed in September 1990 at a cost of Rs 11.02 lakh for stabilised power supply to the Simulator. Based on the performance of the system for four months, provision of the half an hour battery bank was soon considered essential in January 1991. This too was installed in October 1993 at a cost of Rs.9.75 lakh.

The Simulator became unserviceable and was switched off in October 1992 till uninterrupted power supply system was procured.

Meanwhile, due to frequent interruptions in the commercial power supply, some of the components of the Simulator were rendered unserviceable. On the advice of the Central Air Command, the Simulator had to be switched off in October 1992 till such time the uninterrupted power supply system was procured.

The Simulator is unserviceable since July 1996.

During the period 1990-95, the damaged parts/components of the Simulator were got repaired with the help of a foreign firm at a cost of Rs 72.75 lakh and the Simulator was made serviceable. But, the average serviceability of the Simulator during 1990-96 was only 32 *per cent*. It again became unserviceable

in July 1996 and continued to be so as of October 1998 due to failure to procure spares from abroad.

Thus, despite provision of Constant Voltage Constant Frequency System, battery bank and repair of Simulator, the Simulator largely remained unserviceable.

Unserviceability of the Simulator affected the training of pilots.

In the absence of a serviceable Simulator, the trainee pilots were imparted training by frequent briefings and debriefings on various exercises, emergency practice on ground in aircraft and by providing additional sorties on the trainer and fighter aircraft. Since the training of the pilots in class room/flying exercises has its limitations, it adversely affected the training of the pilots.

The Ministry stated, in October 1998, that unserviceability of the components was also attributable to wear and tear and ageing of the Simulator. It added that the Simulator required upgradation of hardware/software.

14 Overpayment to a foreign firm

Valid claim for short supply of equipment valued at Rs 70 lakh was not made due to negligence of Air HQ to detect the discrepancy so obvious in the shipping documents to any person of ordinary prudence.

Contract with a foreign firm catered for supply of five items costing Rouble 438 thousand. Invoice was received for all the five items.

The Ministry concluded an agreement in December 1990 with a foreign firm for supply of certain equipment which, *inter alia*, included five items costing Rouble 438 thousand, equivalent to Rs 1.39 crore♥. As per the terms of payment under the then USSR credit agreement, payment was to be made on the proof of despatch. Air HQ received the invoice in December 1991 through Air Force representative in Moscow for Rouble 438 thousand, equivalent to Rs 1.39 crore for all the five items ordered. Any discrepancy was to be raised within 90 days of bill of lading.

Air HQ failed to detect discrepancy and authorised payment.
Only two packages containing three items were received.

Air HQ received the shipping documents viz. bill of lading, packing accounts etc. alongwith the invoice in December 1991. These documents clearly indicated that the consignment was for two packages containing only three items instead of five. The consignment was received at Embarkation HQ, Mumbai on 25 November 1991. Since Air HQ was in a position to detect the short supply/the discrepancy within 90 days of bill of lading, they ought to have intimated the discrepancy to the supplier besides asking the Embarkation HQ and the consignee depot to inspect the consignment and raise formal discrepancy report within stipulated time. Yet, the Deputy Director Engineering at Air HQ failed to detect the discrepancy and advise the Embarkation HQ and consignee depot to promptly despatch/collect the

♥ 1 Rouble =Rs 31.76

consignment and raise the discrepancy for short supply within the stipulated 90 days of bill of lading. He certified the correctness of the invoice and authorised payment.

The Embarkation HQ, Mumbai took its own time in despatch of the consignment statedly due to non-availability of full wagon load and since they were not told of any urgency by Air HQ. Discrepancy report was actually raised by the consignee depot in October 1992, after the receipt of the two packages containing three items in the depot during January and April 1992. While the stipulated period of 90 days from the date of lading was already over by the time the consignee depot received the packages, they took another six months from the date of receipt to raise the discrepancy report.

COI failed to pin point the lapses.

The Court of Inquiry convened locally by the equipment depot in February 1996 after a delay of over four years recommended regularisation of the cost of the undelivered equipment as cash loss amounting to Rouble 221 thousand, equivalent to Rs 70.18 lakh not due to theft, fraud or neglect. It failed to pinpoint the lapses on the part of Air HQ and suggest remedial measures. The Chief of Air Staff concurred with the recommendation in September 1997.

The Ministry while accepting the facts, in September 1998, did not address the negligence of Deputy Director at Air HQ, which was the main cause for inability to raise the claim for the short supply of equipment and consequential loss of Rs 70.18 lakh.

The Ministry should fix responsibility in this case.

15 Failure to obtain supply of critical armament stores

Air HQ failed to get the validity of credit agreement extended, which led to non-supply of critical armament stores besides idling of advance payment of US $ 154000 for four years.

Failure of Air HQ to get the validity of a credit agreement with a foreign Government extended beyond December 1996 led to non-supply of critical armament stores, which affected adversely the armament training of Air Force, besides, idling of US $ 154000 as discussed below:

The Ministry concluded a contract in February 1993 for supply of seven items of armament stores.

Based on a credit agreement of September 1992, the Ministry concluded a contract with a foreign supplier in February 1993 for supply of seven items of armament stores to be delivered by December 1993 at a cost of US $ 5.93 million, equivalent to Rs 15.59 crore* for meeting the training requirements and war reserves.

* 1 US $ = Rs 26.29

Advance payment of US $ 296500 was made in March 1993. Additional advance of US $ 288000 was paid in September 1994.

In terms of the contract, an advance of US $ 296500, equivalent to Rs 77.95 lakh was paid to the supplier in March 1993. The Ministry signed protocols with the foreign Government from time to time, the last one in May 1996 for extension of the validity of the credit agreement up to December 1996 and further advance of US $ 288000 equivalent to Rs 75.72 lakh was paid to the supplier in September 1994.

Supplier failed to supply items in full up to December 1996.

While the supplier completed the supply of five items in full, it supplied only 1184 item of the sixth against supply order for 1500 and did not supply the seventh item despite extension of the validity of the contract up to December 1996.

Air HQ continued to pursue the supplier for the supply of items but without getting credit agreement extended.

The supplier proposed in December 1997 short-closure of the contract. However, Air HQ did not accept the proposal as the items were critically required and their procurement at any future date would entail much higher cost. Air HQ continued to pursue with the supplier through the Indian Mission abroad for supply of items but without getting the validity of credit agreement extended. The proposal for extension of the credit agreement was submitted to the Ministry for approval only in July 1998. Thereafter, the Memorandum dated 10 August 1998 was sent to the Indian Mission abroad for presentation to the supplier for sending a draft agreement for extending the validity of contract, which was awaited as of August 1998.

Accepting the facts, the Ministry stated, in September 1998, that the matter regarding supply of the items was being pursued with the supplier.

Thus, although Air HQ was aware that supply of items was linked to extension of the credit agreement, they failed to take timely action for extension of credit agreement, which led to non-supply of the critical armament stores affecting adversely the training commitments of Air Force and consequential idle advance payment of US $ 154000, equivalent to Rs 40.61 lakh for four years.

16 Loss due to negligence

Negligence of a signal unit in keeping a tube valuing Rs 14.86 lakh in stock for three and a half years without preventive maintenance rendered it beyond economical repair.

A maintenance and repair establishment issued a tube valuing Rs 14.86 lakh to a signal unit to meet its urgent and critical requirement in August 1990 after obtaining the same from a Depot.

The tube was installed in the radar and put to operation in February 1994. The tube functioned normally for a month and thereafter started tripping frequently. The unit returned the tube to the repair establishment in April 1994

which stated, in May 1994, that the unit failed to follow the preventive maintenance checks and kept the tube in storage for a long time without carrying out any periodical reactivation/functional tests.

Vacuum leak test was carried out in September 1996 for ascertaining the possibility of repair of the tube and results of test were forwarded to Bharat Electronics Limited, Ghaziabad which expressed its inability to repair the tube after examining the test report in December 1996. The tube had to be finally declared beyond economical repair.

The Ministry stated, in September 1998, that since this type of the tube was being used for the first time in Air Force and shelf life reactivation instructions were not specified by the manufacturer, no instructions were available with the unit for carrying out preventive maintenance. The repair establishment attributed the failure of the tube to failure to carry out periodical reactivation/functional tests and this requirement should have been included in the maintenance drill of the signal unit.

17 Recovery at the instance of Audit

A recovery of Rs 2.07 crore was made from HAL by Accounts Officer, DAD (HAL), Koraput Division after it was pointed out by Audit.

An aero-engine costing Rs 2.07 crore was received in damaged condition in 1989.

Air Force imported an aero-engine through HAL[6] in December 1989 at Rs 2.07 crore on deferred payment terms to be paid in ten instalments commencing from 15 March 1992. The aero-engine was found damaged in transit and the amount realised from Insurance Company in March 1993 was retained by HAL. HAL did not intimate Accounts Officer, DAD[7] (HAL) that insurance claim had been realised.

AO(DAD) continued to pay instalments of damaged aero-engine.

The Accounts Officer, DAD (HAL) Nasik Division continued to make payment of instalments of the cost of the damaged aero-engine to HAL from 15 March 1992 onwards.

On being pointed out in audit, Accounts Officer, DAD (HAL) Koraput Division recovered Rs 2.07 crore between August 1996 and August 1998.

[6] Hindustan Aeronautics Limited
[7] Defence Accounts Department

CHAPTER IV : NAVY

Review

18 Naval Dockyard, Mumbai

Highlights

- **Planned refits in seventy seven per cent cases overshot the scheduled time due to poor planning and material management. The audit analysis disclosed extra expenditure of Rs 27.83 crore on manpower in six cases and infructuous efforts of Rs 5.76 crore in two cases besides excess consumption of dry-dock days costing Rs 5.11 crore.**

- **Infrastructure facilities in the dockyard have been created on adhoc basis in the absence of well planned and approved long term plan.**

- **Inconsistent and indecisiveness of Naval HQ and the Ministry, escalated the cost of construction of new dry docks by Rs 55 crore and increase in consultancy charges by Rs 81.89 lakh besides non-availability of docking facilities over the years.**

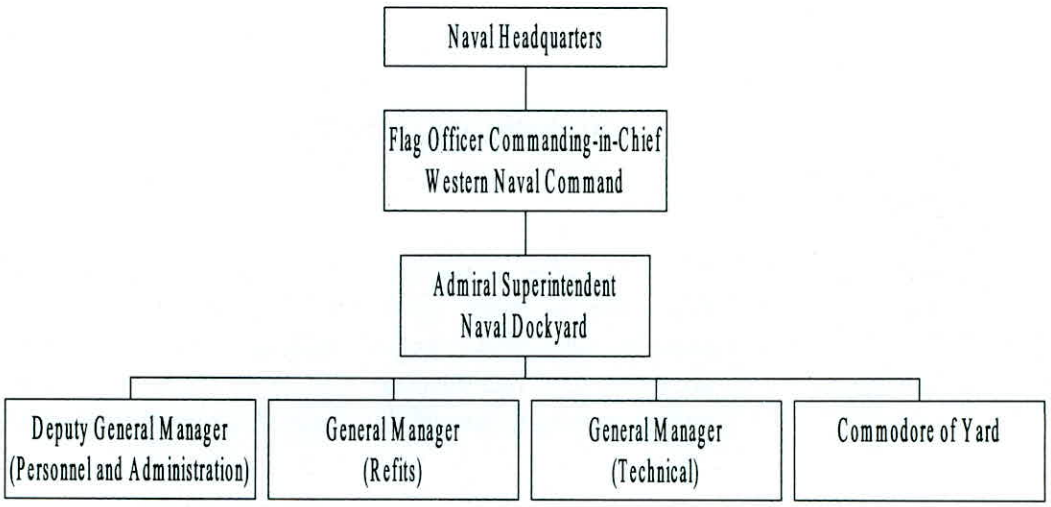
- **Despite heavy expenditure on repair/maintenance of dredging fleet being incurred, the dredging work had to be off-loaded to Dredging Corporation of India.**

18.1 Introduction

The Naval Dockyard, Mumbai is entrusted with the work relating to maintenance and refit, conversions, alterations and modification of Naval ships. It also undertakes work of other departments and private bodies on payment basis subject to availability of capacity.

18.2 Organisational Set up

The organisational chart for chain of control for Naval Dockyard, Mumbai is as follows :



The repair/refit of ships is undertaken in accordance with plans finalised in consultation with Naval HQ.

18.3 Scope of the review

This review covers the performance of Naval Dockyard during the period 1992-97 focussing on maintenance of naval fleet, development of infrastructure facilities for repair and maintenance, financial and cost control.

18.4 Performance regarding refits & repairs

The operational availability of a ship is dependent on the facilities available in the Naval Dockyard for undertaking repairs and refits according to the prescribed refit cycles and spans. The cycle includes short refit, normal refit, medium refit and long refit depending on the material state of ships.

A study of the refits carried out by the dockyard during the period 1992-97 revealed that norms prescribed for carrying out different types of refits were not followed.

Schedule for completion of refits was determined after taking into account force level, requirement of fleet and capacity of repair organisation in consultation with Naval HQ. Despite this, the schedule was not adhered to. Consequently, the time taken by the dockyard to complete the refits was much

more than the planned period, which itself were more than the prescribed norms for different type of refits as indicated below:

Type of refit	No. of refits planned	No. of refits completed in time	Time taken in excess of time planned by Naval HQ				No. of refits for which excess days were planned
			Up to 25%	25 to 50%	50 to 100%	100% and above	
Short	83	20	17	5	15	26	12
Normal	23	4	9	5	5	NIL	10
Medium	13	3	6	3	1	NIL	11
Long	4	1 *	2	NIL	NIL	1	1
Total	123	28	34	13	21	27	34

* Long refit of INS Nilgiri foreclosed as ship has been proposed for decommissioning.

Longer refit time entailed extra expenditure of Rs 5.11 crore.

Thus, out of 123 refits of various types, 95 refits i.e. 77 *per cent* could not be completed within the planned period. Consequently, 82 ships overstayed in the dockyard for 2384 dock days entailing extra expenditure of Rs 5.11 crore on dry-docking.

Admiral Superintendent, Naval Dockyard attributed the delay in executing the refit/repair to non-availability of spares, shortage of dry dock slot and requirement of additional packages detected during docking. It reflected deficiency in the planning and material management processes. Besides, the delayed refits in 34 cases reduced availability of ships to the Navy for 45 to 856 days.

Sample check of cases of excessive delays in completion of refits disclosed extra expenditure of Rs 27.83 crore on manpower as indicated in the table below which are discussed in subsequent paragraphs.

Extra expenditure on manpower				
	Time in months			Rs in crore
	Normal	Excess	Total	
INS Dunagiri	12	28	40	4.52
INS Taragiri	5	24	29	9.02
INS Sindhudurg	12	26	38	1.80
INS Nipat	8	12	20	1.57
INS Himgiri	12	36	48	8.10
SDBT-54	6	24	30	2.82

18.4.1 Medium refit of INS Dunagiri

The Dockyard completed medium refit of the ship in 40 months between October 1990 and February 1994 against the normal scheduled time of 12 months, yet defects relating to main condensers and turbo alternators were not attended to while carrying out the refit.

Delayed completion of refits caused extra expenditure of Rs 4.52 crore on manpower.

Prolonged detention of ship in the dockyard led to large-scale corrosion, development of holes and thinning down of structure, which were reported in June 1994. All these necessitated a short refit of this ship in August 1995. Expenditure incurred on these refits up to March 1998 was Rs 9.92 crore which included Rs 4.52 crore on manpower during the extended period over the scheduled time worked out at annual average per worker cost.

18.4.2 Normal refit of INS Taragiri

The underwater hull work package, re-cabling and hot work was entrusted to MDL[1] at a cost of Rs 4.06 crore to be completed within 150 days i.e., 16 December 1995. However, this had to be extended up to 16 August 1996 due to non-supply of materials by the Naval Dockyard as stipulated in the contract leading to detention of ship for 397 days in MDL in place of 150 days. The cost of the work by MDL was settled at Rs 6.76 crore. The remaining work was completed by Naval Dockyard on 17 December 1997, necessitating detention of the ship for about two years beyond the scheduled date of completion of the refit.

Excess utilisation of man-days entailed extra expenditure of Rs 9.02 crore.

Excessive detention also entailed consumption of 1.26 lakh additional man-days in excess of authorised man-days with financial impact of Rs 9.02 crore.

18.4.3 Medium refit of INS Sindhudurg

The ship commissioned in May 1977 was due for medium refit latest by 1989-90. Refit commenced only in January 1993 due to non-availability of dry-docking slot, lack of capacity and non-availability of required material. However, dry-docking could be possible by the end of January 1994 without ensuring availability of requisite material. The refit was completed on 26 March 1996 i.e., after 38 months against the normal time of one year. The delayed refit involved consumption of 32811 extra man-days with financial burden of Rs 1.80 crore. The delay in the completion of refit was attributable to defective planning of refit requirements, failure to procure required material timely and additional work package.

Refits just before decommissioning of ship lacked propriety.

An emergency refit had to be carried out on this ship from 14 June 1996 to 31 July 1996 for removal of defects and renewal of hull at a cost of Rs 1.32 crore. Immediately after this, the Navy started proceedings for decommissioning of this ship.

[1] Mazagaon Docks Limited

18.4.4 Normal refit of INS Nipat

Poorly planned refits caused extra expenditure of Rs 1.57 crore on manpower.

Normal refit of this ship including change of gas turbine was planned for May 1995 without ensuring the availability of trained manpower and critical spares. Flag officer Commanding, Maharashtra Naval Area had pointed out in August 1995 that lack of technical expertise of the workmen engaged for carrying out this job would lead to undue delay in the completion of normal refit and require several rework. Yet no efforts were made to get this work attended to by Russian experts who were available from 23 June 1995 for carrying out similar work on INS Nirbhik. Eventually, the work could be completed in December 1996 by utilising 20 months period as against scheduled period of eight months. In the process, 21071 additional man-days costing Rs 1.57 crore were consumed.

An emergency short refit of this was also off-loaded to MDL at a cost of Rs 9.97 lakh within two months during February – March 1997.

18.4.5 Normal/Medium refit of INS Himgiri

Medium refit of the ship as per refit cycle was delayed by over 10 years. Instead of this, normal refit commenced in November 1990 for completion by October 1991. This had to be converted into medium refit to be completed by December 1992 since the requirement of work packages were not assessed accurately and spares required for the refit had not been arranged in time. Medium refit continued up to December 1994. The performance of evaporators was poor, the ship had to operate under high boiler salinity leading to contamination of boiler tubes which reduced their life to 12 months from the prescribed life of over 6½ years. Consequently, another modified short refit at an additional cost of Rs 33.54 lakh during February 1995 and March 1996 became inescapable.

Delayed completion of refits entailed extra expenditure of Rs 8.10 crore on man-days.

The ship was detained for medium refit for over 48 months against the norms of 12 months necessitating another modified short refit at an additional cost of Rs 33.54 lakh. Delayed completion of work involved additional expenditure on manpower to the tune of Rs 8.10 crore.

18.4.6 Long refit of INS Shakti

The long refit of the ship was planned to be taken up from September 1989 onwards. Due to non-availability of items/equipment for replacement, it was constantly re-scheduled and a short refit-cum-dry-docking was given from 1 January to 1 June 1990. Long refit was actually taken up from June 1991 and was completed in 42 months against the scheduled time of 18 months. The delay was attributable to late receipt of materials, additions in work, non availability of items for replacement of a beyond economical repair equipment and noticing of fresh defects during refit etc.

Not taking up of the long refit of INS Shakti in September 1989 led to deterioration in the state of the ship with tube leaks during chemical cleaning

and steaming. Delay in supply of the materials further prolonged the refit time of this ship. Besides, leakage during chemical cleaning of the boilers necessitated several reworks. Eventually the long refit could be completed only on 14 November 1994.

18.4 .7 Normal refit of INS Deepak

Due to delay in completion of long refit of INS Shakti, docking slot remained occupied and normal refit of INS Deepak which was due in September 1991 and short refit due in February 1993 could not be taken up.

Non-observance of refit cycle led to premature decommissioning of ship.

Failure to undertake the refits as and when they were due, caused deterioration in the material state of INS Deepak beyond redemption and a decision was taken in November 1994 to decommission it. Despite this, normal refit was taken up in August 1994 and was carried out up to November 1995 involving an expenditure of Rs 1.23 crore. The ship was ultimately decommissioned in April 1996. Consequently, the expenditure of Rs 1.23 crore incurred on repair/refit proved unfruitful.

18.4.8 SDB T 54

The ships of this class built with low strength mild steel and thin plates had low corrosion tolerance. As such adhering to prescribed docking intervals was essential.

This ship was commissioned in September 1982. Its medium refit was due in March 1988 and long refit in April 1992. Ignoring the vulnerability to corrosion of this ship, medium refit was delayed by over three years, which was carried out during July 1991 to April 1992. As a result, long refit could not be planned. However, another short refit including replacement of engine was taken up in December 1993. The short refit was converted into medium refit in February 1994. While carrying out repairs, extensive damage to underwater hull was noticed in March 1994.

The medium refit got prolonged up to May 1996 because the engine and other material procured for this ship were diverted for carrying out ongoing repair of another similar (SDBT-55) ship.

Improper planning for refit led to extra expenditure of Rs 2.82 crore.

Thus, defective planning and delay in carrying out refit led to stretching the medium refit to 30 months in place of six months resulting in extra expenditure of Rs 2.82 crore on manpower.

18.5 Infructuous expenditure on refits

Improper planned repairs of ships, caused infructuous expenditure of Rs 4.53 crore.

In the following cases, the refits/repairs were undertaken without properly evaluating the material state of the ships, the utility of the repairs and due regards to the residual life of the ships involving infructuous expenditure of Rs 4.53 crore.

18.5.1 INS Nilgiri

This ship was commissioned in June 1972. Its long refit was due in September 1993, which was taken up in November 1993 without taking into account the material state of the ship. The Vice Chief of the Naval Staff observed in September 1994 that material state of the ship was very poor. Consequently, long refit was held in abeyance and action to decommission the ship was initiated in September 1994 which was approved by the Ministry in March 1996. In the meanwhile, expenditure of Rs 3.69 crore was incurred on its repair/refits which was rendered unfruitful.

18.5.2 Tug Balwan Yard Craft

After repair work of this craft through a private arrangement at Rs 19.21 lakh in September 1993, its medium refit was taken up which continued up to 1996-97 and expenditure of Rs 46.45 lakh was incurred. However, immediately after the medium refit, proposal for its disposal was mooted in July 1996, which was approved in August 1997 with Professional Officer Valuation price of Rs 4.75 lakh. The expenditure of Rs 65.66 lakh on repair and refit was unjustified.

Similarly, four other Yard Crafts which had become due for decommissioning during 1997-98 were under repairs/refits without evaluation of their future utilisation and examining justification of their repairs. Expenditure on such works incurred up to March 1998 amounted to Rs 19.80 lakh.

18.6 Infrastructure and repair facilities

A master plan prepared by the consultants, National Industrial Development Corporation for modernisation and augmentation of repair facilities in Naval Dockyard in 1970 has not so far been approved. Infrastructure facilities comprising of 83 work centres/workshops sanctioned from time to time had been created. The execution of a few facilities under construction were reviewed in audit which are discussed as under :

18.6.1 New dry dock

The Ministry sanctioned in 1985 construction of a new dry dock at Naval Dockyard, Mumbai at a cost of Rs 51 crore for completion by December 1997. The Ministry revised the sanction and approved construction of a larger size dry dock in July 1986 at a cost of Rs 68 crore. The Ministry engaged consultants in October 1988 for preparation of detailed project report at Rs 92.11 lakh, which was valid up to April 1993.

Meantime, Naval HQ proposed in May 1991 to shift this dry dock project to Karwar and ordered stoppage of all works under execution at Mumbai. The Ministry turned down this proposal and works recommenced in February 1993. It necessitated extension of consultancy agreement up to April 1997 at

a cost of Rs 1.50 crore besides revision in the cost of project to Rs 123.54 crore.

The physical progress of civil works as of June 1998 was only 30.5 *per cent*. The contractor had slowed down the execution of works due to dispute regarding payment of labour rates. Meanwhile, the period of consultancy agreement expired which was revalidated at a cost of Rs 1.74 crore up to April 2000.

Delay in construction of dock led to substantial increase in construction and consultancy cost.

Thus, inconsistent approach and indecisiveness of Naval HQ and the Ministry resulted in delay in the construction of the dockyard besides escalation in the cost by Rs 55 crore with reference to the estimated cost of Rs 68 crore.

18.6.2 Electroplating and battery repair workshop

Mention was made in paragraph No. 22.5.3 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1990, No. 9 of 1991 about delayed completion of civil works and also for failure to take timely action for procurement of the equipment to be installed therein. The composite electroplating and battery repair workshop finally completed in 1995 at Rs 6.23 crore, was commissioned in July 1996. Yet it remained non-operational because large number of defects continued to surface from time to time due to (a) design deficiency, (b) use of inferior quality material, (c) poor workmanship. In addition, the plant also encountered frequent breakdowns like due to leakage in tanks, failure of transloaders and short-circuiting in control panels etc.

Improper execution of civil works led to non-operational of the facility costing Rs 6.23 crore.

Thus, the electroplating and battery repair facility established at a cost of Rs 6.23 crore had remained idle and non-operational since its commissioning, rendering entire investment as unproductive.

Deficient planning and co-ordination in the execution of civil works and procurement of equipment in the development of four other workshops were also noticed. The procurement of equipment and civil works were not matched. Investment of Rs 6.64 crore on civil works and Rs 5.53 crore on equipment did not yield results because in the former case, the equipment to be installed had not been purchased and in the later, connected civil works had not been executed.

18.7 Utilisation of repair and infrastructure facilities

18.7.1 Dry docks

The five dry docks having multiple docking arrangements had 19718 available ship days during 1992-97. However, only 15945 ship days were actually utilised during this period. The unutilised 3773 ship days accounted for under-utilisation of 19 *per cent* dry dock capacity which was attributed by the Naval Dockyard authorities to maintenance of dry docks, non-availability of tide to

facilitate use of dry dock, multiple dock configuration of ships coupled the ships under refit/repair to remain in the docks for more period.

This contention should be viewed in the light of the fact that available ship days were fixed after providing for various contingencies. Besides, keeping the ships for longer period in multiple dock configuration indicated deficient planning and execution of repair/refit work.

Despite under-utilisation of shipyard's days hiring of yards at a cost of Rs 49.34 crore was resorted to.

On one hand, dry dock remained unutilised for 3773 ship days, on the other hand similar facilities had to be hired for 2445 ship days at a cost of Rs 49.34 crore from commercial yard.

18.7.2 Work centres/Workshop

System of maintaining log books was not followed.

The Naval Dockyard had created 98 work centres/workshops for carrying out repair of different types of equipment and machinery fitted in the Naval ships and submarines. Mention was made in paragraph No. 22.8.1 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1990, No. 9 of 1991 about absence of system of maintaining log/plant record book/machinery cards in the dockyard. The position had remained the same. As a result, it was not possible to ascertain the extent of utilisation of plant and machinery installed in these workshops.

18.8 Idle manpower

The idle man-hours increased from 4.48 lakh in 1993-94 to 6.92 lakh in 1996-97 although labour strength decreased from 8352 to 7926 workers during the same period. As a result, idle labour expenditure of Rs 72.89 lakh during 1993-94 increased to Rs 1.50 crore in 1996-97.

18.9 Uneconomical maintenance of dredging fleet

Mention was made in paragraph No.22.9 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1990, No. 9 of 1991 regarding uneconomical maintenance of dredging fleet. As four dredgers out of six were more than 25 years old as of November 1990 and their maintenance by the dockyard was cost prohibitive, the Ministry had agreed that their replacement was essential.

Further review revealed that no action had so far been taken to replace the old dredging fleet. Two dredgers remained under prolonged refit from May 1989 to June 1998 and from April 1994 to November 1997. Similarly, one out of six barges was under refit from May 1994 onwards. The remaining four dredgers with annual output capacity to remove four lakh cubic metres of silt removed only 0.90 lakh cubic metres of silt during the period 1992-95. Thereafter, these have not been used. 30.80 lakh cubic metres of silt was removed by contracting the work to Dredging Corporation of India at a cost of Rs 15.37

Maintenance and operation of dredging fleet was cost prohibitive.

crore, whereas, repair and maintenance expenses on the dredging fleet during the period 1992-93 to 1996-97 amounted to Rs 5.90 crore. Besides, establishment expenditure on the manpower during that period deployed for their operation was Rs 10.80 crore. Thus, entire expenditure of Rs 16.70 crore for maintaining this fleet remained largely unfruitful.

18.10 Non-acceptance of the lowest tender

A dredger, inducted in service in 1965 was out of operation since 1989. Considering capacity constraints, Admiral Superintendent, Naval Dockyard proposed to Naval HQ to off-load this work to private sector with the concurrence of the Ministry. Quotations were invited for its refit in 1992. The rates of Rs 1.21 crore offered by Bright Engineering, Bombay were found reasonable and lowest. The premises of the firm, were inspected by a committee consisting of Additional General Manager(Production) and Additional General Manager(Planning) which observed that the firm had capability, experience and competent technical staff to execute this job. Consequently, acceptance of the lowest rates was recommended in December 1992 to Naval HQ. Although the offer was accepted, yet Admiral Superintendent did not place the order for which no reasons were recorded.

However, after two years fresh quotations were invited in December 1994. Same firm offered the lowest rate of Rs 90.30 lakh which was not accepted on the plea that firm did not possess adequate infrastructure. The contract was allotted to MDL at a cost of Rs 1.39 crore which was revised to Rs 1.68 crore in March 1998. The ground of the dockyard authorities for not allotting the work to the lowest tenderer was not valid, since they had entrusted repair and refit of different systems of various ships to this firm earlier and the committee which inspected the premises of this firm had found it technically competent.

Even after carrying out repairs, the dredger could not be put into operation as of June 1998.

Non-acceptance of lowest tender led to extra expenditure of Rs 77.69 lakh.

Thus, not only extra expenditure of Rs 77.69 lakh had been incurred due to non- acceptance of the lowest offer, the entire expenditure of Rs 1.68 crore on the repair of this dredger has not been productive in view of inability to put this dredger into service.

The matter was referred to the Ministry in November 1998; the reply was awaited as of January 1999.

Works Services

19 Misuse of gymnasium

FOC-in-C approved construction of gymnasium at Rs 66.80 lakh for sailors and officers but used it for running restaurant, ice-cream parlour, health club etc. by private parties and credited the rent to non-Government account. The sailors and officers remained deprived of the gymnasium.

HQ Eastern Naval Command sanctioned in February 1996, the construction of an additional gymnasium at Naval station, Visakhapatnam at Rs 66.80 lakh for sailors and officers of the Navy at the station. The station already had a gymnasium which was not found sufficient for the strength of the sailors and officers at the station. Chief Engineer (Navy), Visakhapatnam concluded a contract in August 1996 for the construction of gymnasium at a cost of Rs 69.23 lakh and the work was completed in October 1997.

Gymnasium was being used as welfare complex to generate revenue for non-Government account.

However, the gymnastic apparatus and other special items required for gymnasium were never purchased and the building was not utilised for the intended purpose. Instead, Flag Officer Commanding-in-Chief, Eastern Naval Command who had sanctioned the gymnasium issued orders in October 1997 for using it as "integrated welfare complex". The complex was being used for running restaurant, bank, ice-cream parlour, beauty parlour, health club, telephone booth, creche, computer education centre, saloon etc. mostly by private parties on rental basis. Rs 1.60 lakh approximately *per annum* collected from the private parties as rent/ contributions was not being credited to Government account but to a non-Government account.

The sailors/officers of the Navy were deprived of gymnasium facilities.

The action of Flag Officer Commanding-in-Chief, is not only infringement of propriety, wherein the assets created at Government expenditure were used for activities not covered under the scales and the income from which was diverted to a non-Government account but in the process the sailors/officers of the Navy were also deprived of gymnasium facilities, despite an expenditure of Rs 69.23 lakh.

The matter was referred to the Ministry in August 1998; the reply was awaited as of January 1999.

20 Savings at the instance of Audit

Unauthorised sanction issued by Southern Naval Command in January 1996 for construction of a school at Rs 72.73 lakh was cancelled in June 1997 at the instance of Audit.

Southern Naval Command cancelled an improper sanction for construction of a school in June 1997 at the instance of Audit as discussed below:

Southern Naval Command sanctioned in January 1996 the provision of Kindergarten school in Kochi Naval Base at a cost of Rs 72.73 lakh . Since a Kindergarten school having 20 class rooms was already functioning close to Kochi Naval Base, sanction of another Kindergarten school for this Naval Base was in contravention of the Government orders of 1983, which stipulate that the Kindergarten school can be provided at military stations where such facility is not available in close vicinity. On this being pointed out in Audit in January 1996, Southern Naval Command cancelled the sanction in June 1997.

The Ministry stated, in February 1999, that the existing Kindergarten school constructed in December 1974 from non-public funds, is being run on ad-hoc basis and is not sufficient to meet the full requirement of 700 children. The Ministry added that the requirement of Kindergarten school in Kochi Naval Base still exists and once proper Kindergarten school is sanctioned, the existing school building will be utilised for other Naval welfare activities. The sanction accorded in January 1996 was cancelled erroneously. The Ministry's reply is not tenable in view of the following:

i. The Ministry failed to produce the Government sanction for construction of the school on defence land from non-public funds.

ii. Government orders of 1983 do not permit sanction of another Kindergarten school in the same vicinity of Naval Base.

iii. The existing school accommodation is sufficient for 700 children.

The fact remains that the sanction was not cancelled erroneously but only at the instance of audit.

Provisioning

21 Extra expenditure in procurement of cotton stockinette

Piecemeal procurement of cotton stockinette by Naval HQ, ignoring the cheaper offer of the firm resulted in extra expenditure of Rs 37.72 lakh.

Failure of Naval HQ to procure 82200 Kg of cotton stockinette against an existing order at cheaper rates offered by the firm resulted in extra expenditure of Rs 37.72 lakh.

The use of cotton stockinette in lieu of cotton rags was introduced in 1993. Material Superintendents Mumbai and Visakhapatnam, conducted a review in April 1993 which revealed requirement of 3.50 lakh Kg of cotton stockinette for one year.

Based on the review, Directorate of Logistics Support in Naval HQ raised an indent in August 1993 for 3.50 lakh Kg of cotton stockinette on Indigenous Purchase Cell of Naval HQ.

The Indigenous Purchase Cell invited tenders in September 1993. The lowest offer of Sumer Chand & Sons, Delhi was Rs 81 per Kg.

Since it was decided to use a mix of cotton stockinette and cotton waste/calico cloth, the requirement was worked out again and the indent was amended to 82200 Kg. The Indigenous Purchase Cell finalised a contract in August 1994 with the same firm and supplies materialised between October 1994 and June 1995.

Naval HQ failed to avail the offer of the firm for supply of additional quantity.

The firm offered in October 1994 to supply any additional quantity of cotton stockinette at the same rate, provided the order was placed latest by 2 November 1994. To avail of the benefit of this offer, Naval HQ carried out a special review of requirement and assessed additional requirement of 82200 Kg of cotton stockinette in October 1994. But considering heavy amount of expenditure required, Directorate of Logistics Support proposed procurement of only 40000 Kg. Assistant Controller of Logistics, however, decided that repeat order could be placed only on completion of delivery of existing order. The rules, however, do not forbid placement of repeat orders even if the supplies against earlier order have not completed.

Meanwhile, the validity of the offer of Sumer Chand & Sons expired. Later Naval HQ after inviting fresh tenders, concluded fresh contract with the same firm in August 1995 for supply of 40000 Kg of cotton stockinette at Rs 126.89 per Kg without concurrence of finance. The supply materialised by November 1995.

Naval HQ procured another 60000 Kg of cotton stockinette from the same firm in March 1996 at Rs 126.89 per Kg. The delivery of cotton stockinette was made by August 1996.

Subsequent purchase at higher rate involved extra expenditure of Rs 37.72 lakh.

Had Naval HQ procured 82200 Kg of cotton stockinette in October/November 1994 by placing repeat order at Rs 81 per Kg as offered by the supplier, additional expenditure of Rs 37.72 lakh on later procurements could have been avoided.

The matter was referred to the Ministry in May 1998; the reply was awaited as of January 1999.

22 Procurement of Aluminium welding cable

Negligence of Director of Logistics Support in not indicating the correct cross section of Aluminium welding cable in an indent raised on Director of Quality Assurance (Naval), in September 1995 led to procurement of 32500 metre of unsuitable cable valuing Rs 15.93 lakh.

Aluminium welding cable is used in joining the two surfaces of metallic wires. Failure to indicate cross section of Aluminium welding cable in the provision review by the Controller of Material Planning and indication of incorrect cross section in the indent placed on Director of Quality Assurance (Naval) by the Director of Logistics Support led to procurement of unsuitable cable valuing Rs 15.93 lakh. The cable was lying unused since its receipt during September-December 1996.

- Controller of Material Planning at Material Organisation, Mumbai carried out a provision review and projected a requirement of 65000 metre Aluminium welding cable on Director of Logistics Support in June 1995, quoting specification No. 0561-R000195, corresponding to the cross section of 70 square mm.

Director of Logistics Support indicated incorrect cross section of cable in his indent.

- Director of Logistics Support, in turn, asked the Director of Quality Assurance (Naval), New Delhi in September 1995 to procure 32500 metre of Aluminium welding cable quoting the same Cat/Part No. 0561-R000195 and also indicated the cross section of the cable on his own. But the cross section indicated in his indent was 82 square mm., while the catalogue/Part No. corresponded to the cross section of 70 square mm.

Director of Quality Assurance failed to notice incorrect cross section of cable in the indent.

- Director Quality Assurance placed a supply order in April 1996 on Kelvin Rubber Limited, Noida for 32500 metre of the cable at a cost of Rs 15.93 lakh. He failed to notice the incorrect cross section of the cable indicated by the Director Logistics Support and indicated the same incorrect cross section of 82 square mm in his procurement order on the firm.

Controller of Material Planning did not point out error in the cross section of cable in the indent placed by Director of Logistics Support.

- Though a copy of the indent raised by the Director of Logistics Support on Director of Quality Assurance was endorsed to Controller of Material Planning, besides to the Material Superintendent and Controller of Warehousing Material Organisation at Mumbai, none of them verified the correctness of the specification indicated in the indent.

- Director Logistics Support belatedly issued an amendment to the indent placed on Director of Quality Assurance on 20 August 1996, i.e. after eleven months of the original indent, changing the Catalogue/Part to No. 6145-007829 for Catalogue/Part No. 0561- R000195.

The Aluminium cable of incorrect specification was lying unused since December 1996.

- The firm supplied the entire quantity of the cable to Naval Stores Depot between September and December 1996, after inspection on 9 August 1996 by Quality Assurance Officer. The entire stock was lying unutilised.

- Material Organisation had to resort to local purchase of 15082 metre of Aluminium welding cable of cross section 70 square mm in May and September 1997 at a total cost of Rs 8.44 lakh to meet the urgent demands.

The matter was referred to the Ministry in June 1998; the reply was awaited as of January 1999.

Miscellaneous

23 Award of fabrication of torpedo carriers to a firm under liquidation

Assignment of fabrication work to a firm under liquidation led to the chassis costing Rs 60.74 lakh being held up unnecessarily causing deterioration in their condition.

Failure of Naval HQ to verify the financial soundness of a firm before assigning fabrication work of torpedo carriers led to chassis costing Rs 60.74 lakh being held up for more than two years, leading to deterioration in their condition. Besides, fabrication from other source is likely to entail an extra expenditure of over Rs 30.78 lakh.

Torpedo carrier is an inescapable requirement for conveyance of torpedoes in the Naval Armament Depots. Naval Armament Depots had deficiency of five torpedo carriers in 1995.

Naval HQ concluded an A/T without verifying the financial position of the firm.

To make up the shortage, Naval HQ placed an order on Ashok Leyland Limited, Chennai for five chassis at a cost of Rs 60.74 lakh in November 1995. Simultaneously, fabrication work and supply of spares was entrusted to Usha Atlas Hydraulic Limited, Calcutta at a cost of Rs 36.74 lakh with

scheduled date for completion as 15 August 1996. This firm was under liquidation from 1992 and an appeal had been pending in the Court since 1994. Naval HQ did not verify the firm's financial position before placement of order.

Chassis were given to the firm when the firm had already stopped operations.

Five chassis though delivered at Calcutta in June 1996, were taken delivery by the firm in September 1996. However, as the operation in the firm had been suspended in February 1996 itself, the firm failed to undertake the fabrication work. Even then the Naval HQ extended the delivery period up to January 1997. The firm finally went into liquidation in December 1996.

The chassis deteriorated while in the custody of the firm. No compensation was enforceable for deficiency/damage in chassis.

The chassis remained in the custody of the firm. An inspection carried out by Naval authorities jointly with the firm in February 1998 disclosed that the chassis were in bad shape. Besides the overall deteriorated condition of chassis, certain items were also missing. The Naval Armament Liaison Officer observed in February 1998 that the chassis will have to be accepted on "as is where is basis" and without any compensation for any deficiency/damage whatsoever.

Naval HQ floated a fresh tender enquiry in June 1998 on two firms for fabrication of body for the five torpedo carriers on the chassis to be retrieved from Usha Atlas Hydraulic Limited, Calcutta. The only offer received from TIL Limited, New Delhi in July 1998 was for Rs 62.25 lakh. Compared to rates of Usha Atlas Hydraulic Limited, Calcutta for this work, the extra expenditure would be at least Rs 30.78 lakh. The validity of this was 90 days which expired in October 1998. Formal contract was yet to be finalised as of November 1998.

In the meantime, Naval Armament Depots had to put up with severe constraints in handling torpedos.

The matter was referred to the Ministry in July 1998; the reply was awaited as of January 1999.

24 Injudicious payment of dry-docking charges

Acceptance of an unusual condition of Mumbai Port Trust resulted in avoidable payment of Rs 23 lakh for extended dry-docking due to breakdown of crane of Port Trust.

Acceptance of an unusual condition by Naval HQ/Ministry led to an avoidable payment of Rs 23 lakh to Mumbai Port Trust towards extended dry-docking of two Naval ships. The broad details were as under:

The short refits of INS Ranvijay and INS Nipat planned in 1992 required dry-docking for 40 days and 20 days respectively. Since dry-docking facilities in Naval Dockyard, Mumbai were not available, the Ministry sanctioned in July

and June 1992 dry-docking of the ships in Mumbai Port Trust at an estimated expenditure of Rs 26.25 lakh and Rs 6.12 lakh respectively.

Unusual condition involving uncertain or indefinite liability was accepted by the Ministry/Naval HQ.

Services to be provided by Port Trust during dry-docking, *inter alia*, included provision of crane also. The scale of rates of the Port Trust contained a condition that Board of Trustees of the Port accept no responsibility, whatsoever, for any detention to vessel using their dry dock. Thus, Port Trust had absolute discretion for imposing dry-docking charges for detention of ships in their dry docks irrespective of circumstances. Acceptance of such a condition involved an uncertain or indefinite liability.

Dry docking of the ships was extended due to break down of crane of Port Trust.

The shafting and rudder work of the ships could not progress due to breakdown of dockside crane of Port Trust and no alternate crane was provided by them. It necessitated dry-docking of both the ships for 49 days from 25 September 1992 to 12 November 1992 against the agreed schedule of 40 and 20 days.

Although dry-docking was extended due to failure of Port Trust, the Ministry paid Rs 23 lakh to them.

The extended dry-docking of the ships involved additional payment of Rs 23 lakh over and above the amount of Rs 26.25 lakh and Rs 6.12 lakh sanctioned earlier. Since the additional payment of Rs 23 lakh made in March 1995 was attributable to failure of Port Trust to provide dockside crane, it warrants refund/adjustment against their future claims. Simultaneous action to avoid acceptance of such conditions in future should also be taken.

The Ministry stated, in January 1999, that extended dry-docking was attributable to extension of shafting work and not to failure of dockside crane. This contention is not tenable as Joint Secretary (Navy) had attributed the extended dry-docking in 1994 to break down of side crane of dockyard.

Chapter V : COAST GUARD

Acquisition

25 Acquisition of advanced off shore patrol vessels

Coast Guard was yet to receive one out of the three advanced off shore patrol vessels for which orders were placed on Goa Shipyard Ltd. in 1990. Two vessels already delivered after two and a half to three years delay were yet to be provided with the desired offensive capability.

Advanced off shore patrol vessels are required by Coast Guard for surveillance in exclusive economic zone for search and rescue, anti smuggling, anti terrorist activities, pollution response and anti poaching operations.

Goa shipyard delayed delivery of off shore patrol vessels to Coast Guard by two to three years.

Scrutiny of documents in Coast Guard HQ disclosed that the delivery of two out of three advanced off shore patrol vessels by Goa Shipyard Ltd., on which orders were placed in June 1990, was delayed by two and a half to three years. The third vessel, the original delivery schedule of which was November 1994, was yet to be supplied as of November 1998. Even in the case of two vessels supplied in November 1995 and March 1997, the necessary equipment viz. Super Rapid Gun Mount and Electro Optical Fire Control System were fitted late which were yet to be approved in trials. Thus, against the plan of inducting three advanced off shore patrol vessels in May 1993, February 1994 and November 1994, the Coast Guard is holding only two vessels supplied in 1995 and 1997, without a proven weapon package. The serious slippage in the induction of off shore patrol vessel is attributable to tardy execution and management of procurement of essential weapon system by Goa Shipyard Ltd. as under:

i. The execution of the construction by Goa Shipyard Ltd. was way behind the schedule. They delivered the first vessel in November 1995, after a slippage of two and a half years from the original schedule of May 1993. Similarly, the slippage in delivery of the second vessel was over three years which was supplied in March 1997. The third vessel was re-scheduled for delivery in January 1999 against the original schedule of November 1994.

ii. The vessel was to be fitted with Super Rapid Gun Mount. Goa Shipyard Ltd. placed order for four Super Rapid Gun Mounts on BHEL[1], Haridwar as late as November 1993, against the original scheduled date of delivery

[1] Bharat Heavy Electricals Limited

of the first vessel in May 1993. One of the four was to be kept on reserve.

Shipyard and Coast Guard failed to anticipate instability of the vessel on fitment of a tonne gear.

iii. The Coast Guard and Goa Shipyard Ltd. failed to anticipate the problems associated with the stability of the ship after mounting the gun which weighed about nine tonne. They addressed the issue only after receipt of the Super Rapid Gun Mount, warranting re-arrangement of ship's layout to ensure that its metacentric height was at the desired level. This further delayed the installation of Super Rapid Gun Mount. BHEL installed them on the two vessels in February 1996 and March 1997.

The other two gun mounts were expected only in June 1999 and February 2000. The delay in supply of these gun mounts was attributable to inability of Coast Guard to carry out firing trials due to non-availability of infrastructure facilities at the firing range.

Ministry delayed entrusting installation of the Electro Optical Fire Control System.

iv. Electro Optical Fire Control System controls the gun mounting and provides night firing capability. Goa Shipyard Ltd. placed order for four Electro Optical Fire Control System on BEL[2], Bangalore as late as September 1994. These were supplied in July 1996 and February 1997 respectively. The Ministry took long time to entrust the work of its installation to BEL, Chennai in July 1997. Only one system had been installed on one of the two vessels in September 1998. It was not compatible with the existing gyro. Another one was likely to be installed in June 1999.

Gun Mounts and Fire Control System were yet to be cleared in trials.

v. The Super Rapid Gun Mount and Electro Optical Fire Control System installed on the ships have also not been put to trial, since the ammunition required for their trial had not been finalised. Two firms were short-listed for procurement of ammunition. Their product was yet to be trial evaluated as of November 1998.

vi. The warranty on Super Rapid Gun Mount and Electro Optical Fire Control System were 30 to 18 months respectively. The warranty period of one of the two Super Rapid Gun Mounts has expired without trial, while 22 out of 30 months warranty period for the second had also elapsed without trial as of November 1998. The warranty of both the Electro Optical Fire Control System had lapsed without their trial.

vii. The Electro Optical Fire Control System supplied by BEL, Bangalore was not compatible with vertical reference gyro, an equipment used for determining the role and pitch of the ship. This warranted procurement of new vertical reference unit at Rs 2.20 crore.

[2] Bharat Electronics Limited

Thus, due to lackadaisical management of the plan for acquisition of advanced off shore patrol vessels and tardy execution by Goa Shipyard Ltd., the Coast Guard was left with two vessels without a proved equipment and weapon package while the third vessel was yet to be supplied as of November 1998.

The matter was referred to the Ministry in December 1998; the reply was awaited as of January 1999.

Works Services

26 Non-utilisation of workshop building

Failure of the Coast Guard HQ to get all the required works sanctioned in 1990 for creation of workshop facilities to repair Dornier aircraft resulted in non-utilisation of workshop building constructed at Rs 47.41 lakh for about five years, besides, expenditure of Rs 1.40 crore on off-loading repair task to HAL.

Despite recommendations of a Board of Officers for additional power supply for the workshop, Garrison Engineer (Naval Works) failed to include it in the estimates. Coast Guard also failed to anticipate the actual requirement while processing the work for sanction. Resultantly, the facilities created at a Coast Guard Air station could not be utilised and repair task had to be off-loaded to Hindustan Aeronautics Limited at an expenditure of Rs 1.40 crore as discussed below:

The Ministry sanctioned in 1990 creation of workshop facilities at a cost of Rs 46 lakh.

Based on the recommendations of a Board of Officers held in September 1987, the Ministry sanctioned in August 1990 creation of workshop facilities for the repair of Dornier aircraft and its components at a Coast Guard Air station at an estimated cost of Rs 46 lakh. Although, the Board had recommended additional power supply for the workshop, the Garrison Engineer failed to include it in the estimates for the work. Coast Guard also failed to anticipate the exact requirements of the workshop.

The workshop constructed in 1993 at Rs 47 lakh was not utilised for want of additional power.

The workshop building was completed in July 1993 at a cost of Rs 47.41 lakh. However, as the required additional power supply, false ceiling and PVC flooring were not provided in the sanction accorded by the Ministry in 1990, the workshop could not be utilised for its intended purpose, necessitating the convening of another Board which made its recommendations in September 1994. The recommendations of Board were approved in October 1995 by Director General, Coast Guard and sanction issued in January 1996 for provision of additional power supply, false ceiling and PVC flooring for the workshop building at a cost of Rs 46.88 lakh. While the work of PVC flooring

and false ceiling was completed at a cost of Rs 2.39 lakh and the work of additional power supply was completed in December 1997, the setting up of test equipment for Super Marec radar was in progress as of March 1998.

Rs 1.40 crore was incurred on off-loading radars for repair.

Due to failure to complete the workshop facilities, Coast Guard had to incur an expenditure of Rs 1.40 crore on off-loading Super Marec radar to Hindustan Aeronautics Limited for repair.

The matter was referred to the Ministry in July 1998; the reply was awaited as of January 1999.

CHAPTER VI : RESEARCH AND DEVELOPMENT ORGANISATION

Air Force

Review

27 Development of an Airborne system

Highlights

- **ASP[1] programme undertaken at a cost of Rs 60.80 crore was running behind schedule by over three years and would be ready for demonstration only by the turn of the century. The main attributes of the technology demonstrator ASP being developed fell short of the projected requirements of the Services in the areas of endurance, speed, altitude and detection range.**

- **The ASP being developed is based on rotodome approach while the proposed import of AWACS[2] was based on phased array approach. The advanced technology of the imported system would render ASP being developed redundant.**

- **Due to delay in the development of high performance transmitter by LRDE[3], a low power transmitter which was earlier considered unsuitable had to be imported at a cost of Rs 9.07 crore.**

27.1 Introduction

Airborne Early Warning and AWACS, capable of providing continuous, comprehensive and long-range air defence cover against low-level attacks had emerged as new force multiplier in early 1980s. Based on the projection made by Air Force and Navy for such systems, a number of studies in the nature of lead-in-schemes were carried out under project "Guardian" from July 1985 at a cost of Rs 16.48 crore.

ASP activity pursued as a number of individual projects.

In all, 43 lead-in-schemes were initiated to be followed by preparation of Detailed Project Report for undertaking the main project. The project was completed only in 1991. At that stage, the project was reviewed by a special group of experts which submitted a report to the Cabinet Committee on

[1] Air Surveillance Platform
[2] Airborne Warning and Control System
[3] Electronics and Radar Establishment

Political Affairs, which recommended that various technologies leading to an ASP be progressed. A review committee under the chairmanship of the Scientific Advisor to Raksha Mantri recommended in 1991 that ASP activity be pursued as a number of individual projects rather than a consolidated Airborne Early Warning programme.

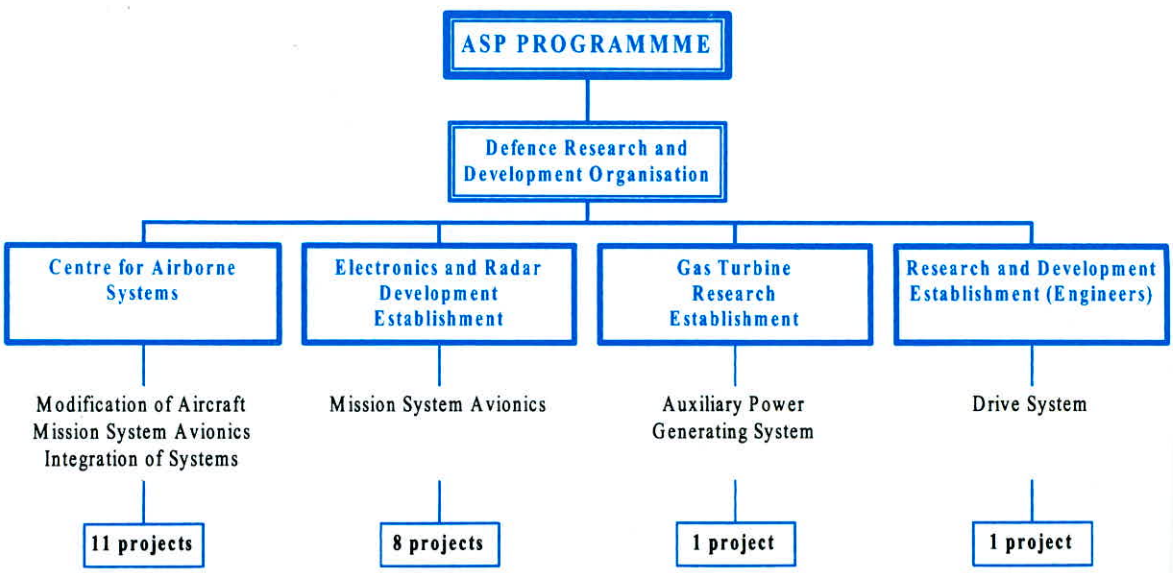
27.2 Scope of Audit

Project "Guardian" sanctioned in July 1985 was reviewed by Audit and comments on delays in execution of lead-in-projects and its impact was included in paragraph No. 53 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1989, No. 11 of 1990. In their action taken note, the Ministry had stated, in April 1991, that spin off benefits had accrued out of these indigenous development efforts and there was scope for likely alternate applications of the test platform developed under the programme. Progress made towards development of ASP through the execution of individual projects and associated activities were reviewed by Audit during 1997-98 in the laboratories involved.

27.3 Organisational set up

CABS set up in February 1991.

The Ministry set up a dedicated laboratory, namely CABS[4] in February 1991 for progressing the technologies and sub-systems necessary for the ASP. The main task allotted to the CABS was design, development, integration and evaluation of airborne electronic systems on a suitably modified flying platform for surveillance of airspace together with command and control functions besides transfer of appropriate technologies to industry. Besides CABS, LRDE, Gas Turbine Research Establishment and Research and Development Establishment (Engineers) were entrusted with the development of ASP sub-systems as depicted below:



[4] Centre for Airborne Systems

27.4 Implementation of the programme

The strategy adopted by CABS involved the development of an ASP using rotodomed HS-748 aircraft as the flight test bed, in the first phase for the development of the indigenous Airborne Early Warning technology to be evolved on a step by step, modular, low cost and low risk approach.

Main attributes of the technology demonstrator ASP fell short of the Services requirement.

CABS prepared a system level characteristics and requirement specification document in September 1992 defining the ASP configuration. However, the main attributes of the technology demonstrator ASP as planned for development fell short of requirements projected by the Services in the areas of endurance, speed, altitude and detection range as indicated below:

	Short fall (in percentage) against	
Attributes	**ASR***	**NAST#**
Endurance	71	80
Altitude	67	67
Mission Speed	69	27-38
Range	33	-

* Air Staff Requirement
\# Naval Air Staff Target

Air HQ while commenting on the system specification document stated, in October 1992, that while the specifications were meant for ASP and were not expected to meet the Air Staff Requirements at that stage, expected that the design philosophy was targeted towards meeting the Air Staff Requirements at a later stage. The Ministry stated, in February 1999, that ASP was not meant to meet the requirements of users but to induct and demonstrate the technology by utilising the only viable platform. The fact, however, remains that the ASP development programme was taken up as a first step towards the development of full fledged AWACS, the need for which was projected by the Services in early 1980s.

No time frame for achieving the development of ASP was set till march 1995.

Further , the ASP configuration document had only set certain goals in terms of specifications to be achieved, but not indicated any time frame for their achievement. Air HQ had stressed that development of time frame for ASP should be such that a full-fledged AWACS deployment should be possible before the turn of the century. Subsequently, in November 1992 while re-examining the viability of the programme it was decided that ASP development programme be spread over a period of five years. However, no time frame to complete the task was fixed by CABS till March 1995.

A comprehensive programme drawn by CABS, only in March 1995, prescribed the achievement of following major milestones of the development as under :

	Milestones	Date of Completion
a)	Platform system	August 1995
b)	Primary radar	October 1996
c)	Ground integration	May 1997
d)	ASP sub-systems integration on the aircraft	September 1997
e)	Aircraft clearance for flight trials	February 1998
f)	ASP ready for demonstration	August 1998

Another three years were required for initial operational clearance.

27.5 Delay in execution

The ASP design and development programme encompassed three main activity areas:

- Aircraft modification (Platform)
- Mission System Avionics, and
- Integration of sub-systems.

Defence Research and Development Organisation sanctioned 21 individual projects at Rs 60.80 crore for development of ASP.

For development of indigenous ASP, twenty one projects at a total outlay of Rs 60.80 crore (Rs 22.25 crore in FE) had been sanctioned between December 1989 and May 1997. Of these, five related to aircraft modification, 12 to mission system avionics and three to integration of sub-systems. The last project sanctioned in May 1997 related to the development of a second system.

27.5.1 Time over-run

None of the projects were completed on time.

The time over-run for the 20 projects which were due to be completed between February 1993 and February 1998 ranged from five months to over three years as indicated in table below:

Time over run	No. of Projects		
	Completed	Under closure	On going
Less than 1 year	5	-	1
1 to 2 years	3	2	2
2 to 3 years	-	1	1
Over 3 years	-	2	3

The project for a second system sanctioned in May 1997 was still in progress.

Three of the five projects relating to aircraft modification scheduled to be completed between February 1993 and June 1994 were completed in extended time with a delay ranging from six to 24 months, while two projects relating to design and development of radar transparent functional rotodome and thermal management were yet to be completed despite lapse of over three years from the scheduled date of completion. Similarly, eight out of the 12 projects relating to mission system avionics including development of primary surveillance radar and two out of three projects pertaining to integration were incomplete as of August 1998 due to delay in development.

Integration of sub-systems to be completed by September 1997 is yet to be taken up.

The delays were attributed to delay in development of sub-systems by other Research and Development Establishments and Public Sector Undertakings, delay in materialisation of imported items, delay in procedural requirements of import and extension of probable date of completion to dovetail the efforts with overall ASP development. Delays in the completion of the project pertaining to aircraft modification and mission system integration is likely to further delay the overall ASP programme, as the sub-system integration which was to be completed by September 1997 was yet to be taken up as of August 1998.

Admitting the delays CABS stated, in October 1998, that due to the complexity of the technology involved and the first time effort by our country in this area of development of airborne surveillance systems, there has been some slippage on realising some of the ASP sub-systems. They added that even though some projects were yet to be completed, all the sub-system hardware required for the current ASP development are ready and awaiting aircraft integration and flight evaluation.

27.5.2 Impact of delay

ASP would be ready for demonstration only by the end of 2000.

As a result of delay in development, most of the milestones set for development of ASP had not been achieved as of August 1998. Since 22 months would be required for demonstration of ASP after development of primary radar which was yet to be completed, the ASP would be ready for demonstration only by the end of 2000, provided all the sub-systems are ready by 1998. Even if developed, the ASP would fall short of the qualitative

requirement projected by the Services way back in 1984. Moreover, the qualitative requirement of the Services based on which the ASP programme had been launched would be outdated due to technological advancement in the field.

The Ministry stated that the milestones namely platform systems, primary radar, ground integration and limited ASP sub-system integration on the aircraft had been completed. The ASP, in January 1999, while undergoing flight trails to fine tune the various sub-systems of primary radar crashed and this could impact on the programme.

Air HQ proposed acquisition of AWACS through import.

Notwithstanding, the development of indigenous ASP, Air HQ proposed, in July 1996, acquisition of first AWACS through import with technology transfer package leading to indigenous development of subsequent systems. The proposal envisages an AWACS based on different platform using phased array inside a fixed rotodome. Since the technology of AWACS proposed to be acquired is based on phased array, which is different from the technology on which ASP is being developed indigenously, the ASP under development by Defence Research and Development Organisation based on rotodome approach may possibly be rendered redundant.

Knowing fully well that the requirement of AWACS by Air HQ was based on phased array inside fixed rotodome, the wisdom of sanctioning development of second sub-system for ASP programme based on rotodome technology on HS - 748 aircraft in May 1997 at a cost of Rs 10 crore is questionable.

27.6 Procurement of low power transmitter

Delay in development of high power transmitter led to import of sub-systems at Rs 9.07 crore.

While firming up requirement of the airborne radar to be installed on the ASP, import of low power transmitter with technology transfer was considered. However, in view of its limited range and shortcomings in the performance of its receiver and signal processor, it was decided that LRDE would develop the transmitter indigenously. Sanction was accorded by Ministry in October 1991 for development of high average power high performance transmitter by LRDE at a cost of Rs 3.50 crore to be completed by October 1995. While the development of high power transmitter was yet to be completed, the low power transmitter which was earlier considered unsuitable was configured from the sub-systems imported at a cost of Rs 9.07 crore. Ministry stated that since the primary radar sub-systems were ready for integration, ground check out and flight trials, a deliberate decision to carry on with the programme with a low power transmitter was taken in view of the delay in the design and development of high power transmitter.

Aeronautical Development Agency

Review

28 Light Combat Aircraft

Highlights

- **The development and subsequent production of the LCA[5], which was conceived as replacement of the ageing fleet of the Air Force in the nineties, is still at the development stage with many uncertainties. It's development by ADA[6], Bangalore funded by the Defence Research and Development Organisation has been beset with delays for almost every vital component of the aircraft. The development project, initiated in 1983 for completion by 1990 is behind the schedule by at least 8 1/4 years. As per present indications and despite the Ministry's optimism, the LCA can be expected to be inducted, if at all, after 2005.**

- **The first technology demonstrator is likely to be test flown not before mid 1999, while the final operational clearance is not expected before 2005. That would mean setting up of production facilities and actual production thereafter.**

- **The delay in development of a modern LCA has compelled the Air Force to seek interim measures to cover the shortfall in force level by upgrading the MiG Bis aircraft with help of a foreign firm at Rs 2135 crore.**

- **Development of airframe by ADA, multimode radar jointly by HAL[7] and Electronics and Radar Development Establishment, flight control system by Aeronautical Development Establishment Bangalore, Kaveri engine by Gas Turbine Research Establishment, digital electronic engine control jointly by HAL and Gas Turbine Research Establishment are all lagging behind the schedule with no amount of certainty about their expected date of satisfactory development and final cost of development. Any of them falling further behind or failing to meet the required quality is likely to jeopardise the LCA programme in terms of time further.**

[5] Light Combat Aircraft
[6] Aeronautical Development Agency
[7] Hindustan Aeronautics Limited

- **The existing model of the airframe, on which the ADA is working is heavier in weight than that set in the Air Staff Requirements and the aerodynamic configuration was not acceptable to the Air Force. These are likely to affect the performance of the aircraft with reference to the Qualitative Requirement.**

- **The cost of most of the individual components of the project and the total project has multiplied many times. The originally envisaged cost of Rs 560 crore has overshot by approximately four times to Rs 2188 crore for the Phase-I of the project alone. Phase-II was yet to be sanctioned.**

28.1 Introduction

Decline in combat aircraft warranted a replacement from 1990-91

The combat force level of the Air Force was expected to decline sharply in the 1990s and beyond due to phasing out of the existing ageing aircraft. The Long Term Re-Equipment Plan 1981 projected a shortage of 11.4 *per cent* squadrons in 1990-91 and 40 *per cent* squadrons in 1994-95. The position beyond 1995 was expected to be even worse. This deficiency in combat force level and the gap in indigenous design and development capability in the aeronautical field was proposed to be met through the development of an advanced multirole LCA.

LCA programme was launched in 1985.

The LCA programme spread over 8 to 10 years was approved by the Government in August 1983 at an estimated cost of Rs 560 crore. The programme was formally launched in 1985 and is still in progress.

The prototype version of LCA was to be developed around a proven imported engine, with the production version using indigenous engine. Sanction for design and development of indigenous engine by GTRE[8] at an overall cost of Rs 382.81 crore was accorded in March 1989 and the development work is still in progress.

28.2 Scope of Audit

Paragraph No. 50 of the Report of the Comptroller and Auditor General of India, Union Government, Defence Services (Air Force and Navy) for the year ended 31 March 1988, No. 3 of 1989 had brought out delays in execution of the project up to the project definition stage, weaknesses in planning and deficient financial management. The progress made in the execution of the LCA programme and the engine project was further examined in Audit during 1997-98.

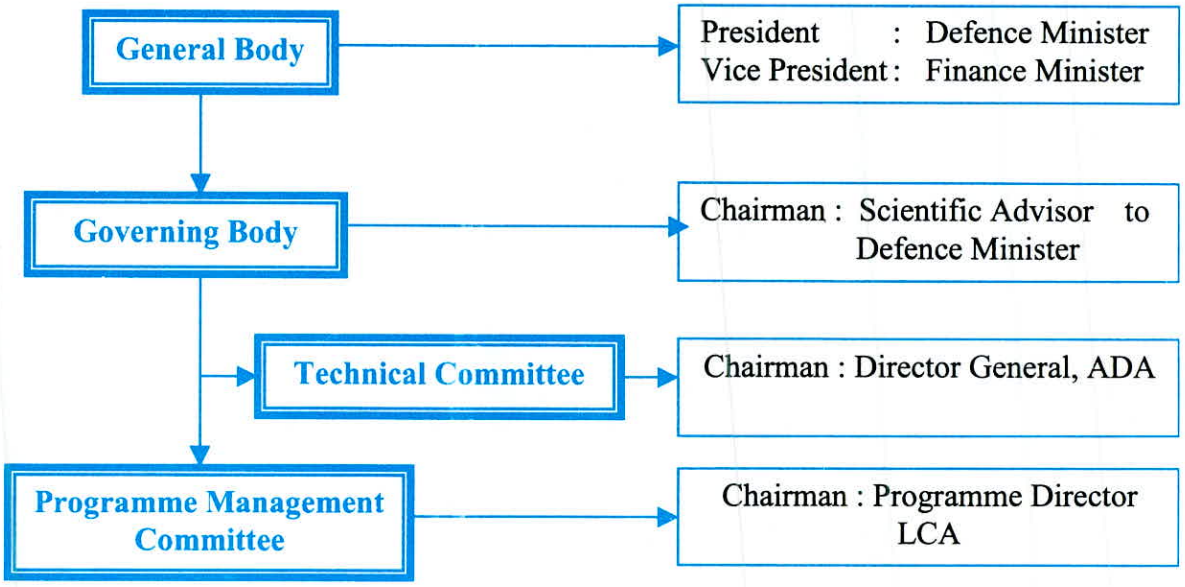
[8] Gas Turbine Research Establishment

28.3 Implementing agency

ADA was entrusted with the management of LCA programme.

ADA was constituted as a registered society in June 1984. It was entrusted with the management of LCA programme by integrating the skills and resources in aeronautical industries, research organisations and academic institutions through a collaborative enterprise by drawing up memorandum of understanding between the ADA and the collaborating organisations. In all, 64 work centres, including the ADA, are involved in the programme.

The LCA management structure which is responsible for progressing the scientific and technical activities of ADA and for effective monitoring of aims and objectives of the society is as indicated in the chart given below :



28.4 Scope of the programme.

The PDP document prepared with help of French consultant conceived a very heavy LCA.

The LCA programme was sanctioned in August 1983 with the aim of meeting the operational requirements of the Air Force for 1990s and beyond. The feasibility report of May 1985 conducted with the help of four foreign firms found that various development activities pertaining to the programme were to be completed within 126 months from the date of go-ahead in January 1985. ADA prepared the PDP[9] document with help of MBB, France to define the airframe and its systems in December 1988 at Rs 13.29 crore. Air HQ reviewed the PDP document in March 1989 and found it deficient in the crucial parameters of aerodynamic configuration, volume and weight as set in Air Staff Requirements, particularly with reference to significant increase in weight of LCA, which could adversely affect performance.

[9] Project definition phase

DRDO and Air Force failed to resolve deadlock on crucial parameters.

Subsequently, an expert committee, consisting of members from DRDO[10] and Air Force failed to resolve the differences between DRDO and Air Force regarding the important performance parameters of LCA. To resolve the deadlock they decided, in March 1990, that FSED[11] be undertaken in a phased manner to demonstrate confidence levels in critical technology areas before making major investments in multiple prototype manufacture, full flight test and full scale production.

They decided to undertake engineering development before prototype manufacture.

The LCA prototype to be evolved out of the technology demonstration platforms built under the FSED, was to incorporate all technologies except radar, electronic warfare system and weapons.

28.5 Full Scale Engineering Development

Phase-I of FSED commenced from April 1990.

The execution of Phase-I of FSED commenced in April 1990. Approval of the Cabinet Committee on Political Affairs for Phase-I of the FSED at an estimated cost of Rs 2188 crore (FE Rs 873 crore) was obtained in April 1993. Following major milestones were to be accomplished in Phase-I of the FSED:

Roll out of first technology demonstrator	June 1995
First flight of first technology demonstrator	Dec 1996
First flight of second technology demonstrator	September 1997
Completion of 210 hours flight	June 1998

There were delays in accomplishment of the milestones due to delay in development of various sub-systems. Delays in development of multimode radar, flight control system, indigenous engine and its control system resulted in cost over-run of Rs 525.95 crore. The foreign exchange content went up by Rs 326.34 crore as indicated in the table below.

(Rs in crore)

	Estimated cost		**Revised cost**	
	Total	FE component	Total	FE component
Radar system	62.27	35.37	100.05	69.65
Flight control system	57.80	42.82	160.00	118.32
Indigenous Engines	382.81	155.39	760.00	365.03
Engine control system	8.96	5.19	17.74	12.11

[10] Defence Research and Development Organisation
[11] Full Scale Engineering Development

First flight of first technology demonstrator expected by July 1999.

While the roll out of the first technology demonstrator was achieved by November 1995, its first flight is expected only by July 1999 against target of December 1996. The second technology demonstrator rolled out in August 1998 is expected to have its first flight by October 1999 against the target of September 1997.

Embargo imposed had adversely affected the LCA programme.

ADA stated, in July 1998, that slippages in system integration, Flight Control System development and embargo imposed recently were the reasons for the delay. This is likely to delay the completion of other milestones and affect adversely the entire programme. Phase-II of the programme was linked with the roll out of first technology demonstrator.

Proposal for Phase-II of FSED yet to be submitted.

The Ministry had stated, in December 1994, that the LCA was expected to enter into squadron services with Initial Operational Clearance by 2002 and with Final Operational Clearance by 2005 provided Government approved Phase-II of FSED in 1995 and accorded clearance for production in 1997. Since proposal for approval of Phase-II of FSED was yet to be submitted to the Government, the chances of meeting the induction schedule of LCA by 2002/2005 were remote.

The Ministry explained, in February 1999, that delay in conducting first flight of first technology demonstrator was the main reason for not seeking sanction for Phase-II of FSED. However, clearance for an interim Phase-II from the Government was underway and Phase-II would be concurrently undertaken with the last two years of Phase-I. With this arrangement, Initial Operational Clearance in 2003 and Final Operational Clearance in 2005 would be realised. However, there would still be a delay of one year in Initial Operational Clearance.

28.6 Development of radar system

Failure to develop antenna resulted in it's import at Rs 1.22 crore.

The indigenous development of multimode radar jointly by HAL, Hyderabad and LRDE[12] to be completed by December 1997 was sanctioned in June 1991 at a cost of Rs 62.27 crore (FE Rs 35.37 crore). A consultancy contract for certain selective areas was concluded by HAL, Hyderabad in April 1994 with Ericsson of Sweden at a cost of SEK 25.74 million. The cost of the project was revised to Rs 100.05 crore (FE Rs 69.65 crore) as of March 1996. The consultant whose suggestions had earlier in 1986 been found not helpful in building indigenous capability to develop multimode radar was retained as consultant up to flight trials of indigenous multimode radar i.e. up to March 1998. LRDE which was entrusted with development of signal processor and antenna for the multimode radar, failed to develop the antenna in time. As a result, three antennae with specification close to those of multimode radar antenna was imported from GEC-Marconi Avionics, UK for Rs 1.22 crore. The date of completion of the project has been extended up to December 1999,

The project was delayed by 24 months.

[12] Electronics and Radar Development Establishment

resulting in a slippage of 24 months. The expenditure incurred on the project as of December 1998 was Rs 69.29 crore. Rs 3.92 crore had been paid to the consultant as of March 1998. The envisaged consultancy had not been utilised fully. Financial implication of extension of consultancy due to delay in the project was yet to be finalised.

The Ministry stated that non-acceptance of the routes suggested by Ericsson of Sweden by an expert committee did not mean that consultant had not properly done his work. It added that consultancy had been used on as required basis. The fact, however, was that the options suggested by the consultant were considered expensive and not found helpful in building indigenous capability to develop multimode radar.

28.7 Flight control system

ADA accorded a `go ahead' sanction in June 1990 for the development of flight control system for LCA by ADE[13] to avoid a mismatch between the airframe and the Flight Control System. Formal sanction for the development programme to be completed by December 1994 at a cost of Rs 57.80 crore (FE Rs 42.82 crore) was accorded in December 1990. ADE concluded a contract with Martin Lockheed Overseas Corporation, USA in December 1992 for joint development of flight control system at a cost of US $ 16.053 million which *inter alia* contemplated completion of integration test of the flight control system by January 1995.

Flight control system scheduled for completion by 1994 was yet to complete fault free testing.

Due to delay in development, the cost was revised to Rs 107.89 crore (FE Rs 92.91 crore) in August 1994 to cater to the variation in exchange rate and restructuring of the contract. The expenditure on restructuring of the contract to meet the requirement of roll out of first technology demonstrator in February 1995 was US $ 2.40 million. As the roll out of first technology demonstrator could not be achieved by February 1995, date of completion was extended from December 1994 to July 1998. The cost of the project was further revised in March 1996 to Rs 137.24 crore (FE Rs 118.32 crore). The increase in project cost *inter alia* included a negotiated amount of US $ 2.75 million for revision in schedule to match with the extended date of completion of FSED Phase-I. The cost of project was again revised to Rs 160 crore.

The flight control system is required to complete 50 hours of fault free testing before it can be used to test fly the aircraft. Now with the embargo, the development and testing of the flight control system will have to be accomplished through an alternative route.

The Ministry stated that due to the US embargo development of the flight control system had to be reinitiated within the country leading to additional effort and delay. While 50 hours of fault free testing was expected before July 1999, the Ministry admitted that delay in design and development of flight

[13] Aeronautical Development Establishment

control system had pushed the LCA programme behind schedule by 30 months.

28.8 Import of engines

The prototype version of LCA was planned to be developed around a proven imported engine, while the production version was to use the Kaveri engine to be developed by GTRE, Bangalore. A contract was concluded with General Electric, USA in October 1986 for the supply of eleven engines at a cost of Rs 66.24 crore for the six prototypes.

Five out of eleven engines costing Rs 16.67 crore were rendered surplus.

Subsequently, with the decision to switch over to FSED route and the number of prototypes to be built reduced from six to two, five of these engines costing Rs 16.67 crore were declared surplus and are awaiting disposal. The Ministry intimated, in June 1995, that efforts were on to find a suitable customer with the help of the manufacturer. No action in this regard was, however, taken. ADA stated, in November 1997, that it would be premature to dispose of the engines, until the Kaveri engine, now under development are available

Continued flight support beyond 1994 necessitated restructuring of contract at an additional expenditure.

Further, with the change in the programme, the flight trials were expected to be over by 1998 instead of the originally envisaged 1994. This necessitated restructuring of the contract in September 1994 for providing flight support up to December 1999 at an additional expenditure of Rs 8.15 crore.

28.9 Development of an indigenous engine

The Ministry sanctioned in March 1989 design and development of Kaveri engine by the GTRE, Bangalore at Rs 382.81 crore (FE Rs 155.39 crore). The work commenced in April 1989. The probable date of completion of the project was December 1996. Six milestones of the project were as under:

—	Commencement of core engine demonstration	September 1991
—	Commencement of full engine demonstration	June 1992
—	High altitude testing abroad	June 1994
—	Preliminary flight rating tests	December 1995
—	Type test	June 1996
—	Production clearance	December 1996

There have, however, been slippages in completion of these milestones. The first milestone was completed in March 1995 after a delay of 42 months and the second milestone in September 1995, after 37 months delay. This caused slippages on the completion of subsequent milestones. The Ministry attributed delays to redesigning of the systems, difficulties in getting standard components and delay in development of Kaveri digital engine control system. GTRE revised the project completion date to March 2000, involving time over-run of 39 months. The Aero Engine Development Board in its meeting of October 1997 indicated that the Kaveri engine would be ready by the end of 1998 for its integration with the first prototype of LCA and flight testing for Initial Operational Clearance by 2002. Thus, even the revised time schedule is unlikely to be met. The cost of the project was also enhanced to Rs 760 crore (FE Rs 365.03) with a cost overrun of Rs 377 crore. An expenditure of Rs 461.81 crore had been incurred on the project as of October 1998.

Indigenous engine development running 39 months behind schedule.

28.10 Development of an engine control system

FADEC[14] provide fuel efficiency and life to engines. The Ministry sanctioned project for design and development of FADEC at a cost of Rs 8.96 crore (FE Rs 5.19 crore) to GTRE in February 1985 to be completed by February 1991, which was later revised twice to Rs 15.76 crore in November 1990 and Rs 17.74 crore (FE Rs 12.11 crore) in May 1994. GTRE, in turn, concluded a contract with HAL, Lucknow at Rs 8.96 crore in April 1985 for supply and integration of FADEC with the engine. While the FADEC project was in conception stage HAL had stated that it was feasible to develop the FADEC on its own but the engine project being a time-bound one, it was considered pragmatic to seek design and development collaboration. HAL engaged in April 1985 Dowty Smiths Industries Controls Limited, UK for 10 years. Rs 3.60 crore had been paid to the foreign firm till March 1995. However, the FADEC project scheduled to be completed by February 1991 was delayed abnormally and had not been completed as of March 1998.Rs 17.25 crore (FE Rs 11.94 crore) had been spent on the project.

FADEC project scheduled for completion by February 1991 was abnormally delayed.

Indigenous development of Kaveri digital engine control system jointly by GTRE and HAL at a cost of Rs 59.12 crore (FE Rs 31.48 crore) was sanctioned in November 1992 to be completed by December 1997. The Aero Engine Development Board in its meeting in October 1997 approved extension of the completion date of the project up to 2002. This would have an adverse impact on the development of the Kaveri Engine project in terms of time. Rs 32.59 crore had been spent on the project till October 1998.

Indigenous Digital engine control system likely to be completed by 2002.

The Ministry stated that though the FADEC project certainly took a longer time for its completion, it was closed after compliance of all objectives. However, consequent to switch over to indigenous development, the expenditure of Rs 17.25 crore on FADEC project did not serve the intended purpose.

[14] Full Authority Digital Electronic Control System

28.11 ADA and Work centres

ADA was yet to take stock of assets created out of LCA funds.

The ownership of the equipment, machinery, buildings and other assets acquired out of project funds was to rest with ADA. ADA was, however, yet to take up stock verification of assets created out of LCA funds both at ADA and work centres. The Ministry stated that while stock verification of assets created at ADA had been completed for procurement made up to 31 March 1997, the details of assets created at different work centres were awaited.

No memorandum of understanding was signed with 27 work centres.

Most of the assigned work packages were inflicted by time and cost over-runs.

Sixty four work centres had been engaged in the project till March 1998 and 384 work packages costing Rs 1847.34 crore had been allotted to them. Out of these, 152 work packages have been completed and 232 were in progress as of March 1998. ADA entrusted works to 27 work centres without signing a memorandum of understanding with them. There were time and cost over-runs in respect of most of the assigned work packages. Out of 114 work packages selected for study, it was noticed that there were delays ranging from two years to over four years in 61 cases and up to two years in 50 cases. The remaining three work packages were in progress. The slippages in turn were bound to affect the overall progress of LCA programme.

In the case of ADA and HAL Aircraft Design Bureau, no individual sanction against the work packages under execution by them was issued. In the absence of this, it was not possible to analyse the actual expenditure with reference to the sanctioned / estimated cost. Cost over-run ranging from 25 to over 323.53 *per cent* were also noticed in respect of 52 out of 114 cases selected in audit.

The Ministry agreed that most of the assigned work packages being research oriented the precise scope and contents of works could not be defined initially. This led to delay in their completion and consequential cost escalations.

28.12 Conclusion

The delay in the LCA programme by 99 months has compelled Air Force to exercise other options to fill the gap in the force level. The Ministry concluded a contract for upgradation of 125 MiG Bis aircraft with its manufacturer at a cost of US $ 626 million, equivalent to Rs 2135 crore♠ in November 1995. A contract was also concluded in November 1996 for import of 40 SU-30 combat aircraft from Russia at a cost of Rs 6310 crore to minimise the adverse impact of delay in development of LCA on the combat force level of the Air Force.

While the total development cost of LCA over a period of eight to ten years was assessed in August 1983 at Rs 560 crore, the feasibility study assessed the development and production investment cost at Rs 750 crore in May 1985. As against this, the cost of FSED Phase-I alone was estimated to be Rs 2188 crore against which Rs 1449 crore had already been spent on the LCA programme

♠ 1 US $ = Rs 34.10

till March 1998. The unit fly-away cost of LCA assessed as Rs 10.30 crore in 1985, is now estimated to cost between Rs 80 to 85 crore.

Accepting the facts, the Ministry stated, in February 1999, that as many technologies were being developed within the country for the first time, there had been an underestimation in time of some projects directly related to the LCA programme. It also added that while upgradation of MiG-21 Bis was of direct relevance to the LCA programme, induction of SU-30 aircraft meant to fulfil a different role altogether was independent of LCA programme.

Jai Narain

(J.N. GUPTA)
Principal Director of Audit
Air Force & Navy

New Delhi
Dated

- 5 APR 1999

Countersigned

V. K. Shunglu

(V.K.SHUNGLU)
Comptroller and Auditor General of India

New Delhi
Dated

26 APR 1999

Appendix-I

(Referred to in Paragraph 6)

Position of ATNs outstanding as of January 1999

Sl. No.	Report No. and Year	Chapter of the Report	Para No.	Pertains to	Brief subject	Remarks
1.	9 of 1993	IV	27	Navy	Unauthorised use of Government building for running Naval Public School	Final ATN awaited
2.	9 of 1993	IV	38	Navy	Unauthorised Provision of residential telephone	Final ATN awaited
3.	9 of 1994	IV	25	Navy	Procurement of soot blowers	Final ATN awaited
4.	9 of 1995	II	3	(MOD) Navy	Unauthorised funding of a project	Final ATN awaited
5.	9 of 1995	IV	15	Navy	Naval Air Stations	Final ATN awaited
6.	9 of 1995	IV	16	Navy	Naval Yardcraft	Final ATN awaited
7.	9 of 1995	IV	27	Navy	Extra payments on power consumption	Final ATN awaited
8.	9 of 1996	II	3	MOD	Avoidable expenditure due to incorrect claims	Final ATN awaited
9.	9 of 1996	III	13	Air Force	Delay in computerisation of an Indian Air Force Command	Final ATN awaited
10.	9 of 1996	IV	22	Navy	Import of defective system	Final ATN awaited
11.	9 of 1996	IV	31	Navy	Avoidable expenditure	Final ATN awaited
12.	8 of 1997	II	2	MOD	Delay in setting up of repair facilities	Final ATN awaited

Sl. No.	Report No. and Year	Chapter of the Report	Para No.	Pertains to	Brief subject	Remarks
13.	8 of 1997	III	5	Air Force	Specialist vehicles held by IAF	Final ATN awaited
14.	8 of 1997	III	6	Air Force	Unfruitful expenditure on procurement of radars	Final ATN awaited
15.	8 of 1997	III	7	Air Force	Procurement of missiles	Final ATN awaited
16.	8 of 1997	III	9	Air Force	Procurement of unsuitable gliders	Final ATN awaited
17.	8 of 1997	III	11	Air Force	Procurement of unsuitable machines	Final ATN awaited
18.	8 of 1997	III	14	Air Force	Wasteful expenditure on import of an equipment	Final ATN awaited
19.	8 of 1997	IV	17	Navy	Avoidable expenditure in construction of excess accommodation	Final ATN awaited
20.	8 of 1997	I V	18	Navy	Delay in provision of radars	Final ATN awaited
21.	8 of 1997	IV	22	Navy	Extra expenditure in procurement of cotton waste	Final ATN awaited
22.	8 of 1997	IV	23	Navy	Procurement of Article TEM-3 without cables	Final ATN awaited
23.	8 of 1997	IV	24	Navy	Non-deduction of income tax at source	Final ATN awaited
24.	8 of 1997	IV	26	Navy	Delay in setting up of engine test facilities	Final ATN awaited
25.	8 of 1997	IV	27	Navy	Avoidable loss due to delay in preferring railway claim	Final ATN awaited
26.	8 of 1997	V	29	Coast Guard	Wasteful investment on construction of jetty	Final ATN awaited
27.	8 of 1997	VI	31	R&D org	Delay in commissioning of an imported equipment	Final ATN awaited

Appendix-II

(Referred to in Paragraph 6)

Position of ATNs outstanding as of January 1999

Sl. No.	Report No. and Year	Chapter of the Report	Para No.	Pertains to	Brief subject	Remarks
1.	8 of 1998	II	4	MOD	Delay in decision leading to extra expenditure	Final ATN awaited
2.	8 of 1998	II	5	MOD	Response of the Ministries/ departments to Draft Audit Paragraph	ATN not received
3.	8 of 1998	II	6	MOD	Follow up on Audit Reports	ATN not received
4.	8 of 1998	III	8	Air Force	Induction and utilisation of MI-26 helicopter	ATN not received
5.	8 of 1998	III	9	Air Force	Procurement of laser guidance kits	ATN not received
6.	8 of 1998	III	10	Air Force	Failure to conclude contract within validity period	ATN not received
7.	8 of 1998	III	11	Air Force	Extra expenditure due to delayed sanctioning of civil works	ATN not received
8.	8 of 1998	III	12	Air Force	Clearance of defective material	ATN not received
9.	8 of 1998	III	13	Air Force	Import of an incorrect interchangeable item	Final ATN awaited
10.	8 of 1998	III	14	Air Force	Procurement of an unsuitable system	Final ATN awaited
11.	8 of 1998	III	15	Air Force	Non-utilisation of transmitters	ATN not received
12.	8 of 1998	III	16	Air Force	Indecision on collection of scrap	ATN not received
13.	8 of 1998	III	17	Air Force	Fabrication of Mechanical Runway sweepers	Final ATN awaited
14.	8 of 1998	III	18	Air Force	Extra expenditure due to non-enforcement of risk clause and failure to place orders within validity of offers	ATN not received
15.	8 of 1998	III	19	Air Force	Avoidable loss due to delay in detection of non-receipt of equipment	Final ATN awaited
16.	8 of 1998	III	20	Air Force	Recoveries at the instance of Audit	ATN not received

Sl. No.	Report No. and Year	Chapter of the Report	Para No.	Pertains to	Brief subject	Remarks
17.	8 of 1998	III	21	Air Force	Delay in clearance of cargo	ATN not received
18.	8 of 1998	IV	25	Navy	Avoidable expenditure due to delay in according financial concurrence	ATN not received
19.	8 of 1998	IV	26	Navy	Non-utilisation of assets	Final ATN awaited
20.	8 of 1998	IV	27	Navy	Extra expenditure in procurement of spares	ATN not received
21.	8 of 1998	IV	28	Navy	Extra expenditure due to delay in procurement of underwater valves	ATN not received
22.	8 of 1998	IV	29	Navy	Failure to invoke risk purchase in time	Final ATN awaited
23.	8 of 1998	IV	30	Navy	Purchase of sub-standard items	ATN not received
24.	8 of 1998	IV	31	Navy	Inordinate delay in installation and commissioning of a system	Final ATN awaited
25.	8 of 1998	IV	32	Navy	Recovery of RS 1.53 crore at the instance of Audit	Final ATN awaited
26.	8 of 1998	IV	33	Navy	Negligence in releasing a salvaged ship	ATN not received
27.	8 of 1998	V	34	Coast Guard	Recovery of overpayment at the instance of Audit	ATN not received