

**REPORT OF THE
COMPTROLLER AND AUDITOR GENERAL
OF INDIA**

FOR THE YEAR ENDED 31 MARCH 1989

No. 11 of 1990

**UNION GOVERNMENT
(DEFENCE SERVICES - AIR FORCE AND NAVY)**

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PREFATORY REMARKS

This Report for the year ended 31 March 1989 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 the Ministry of Defence, Air Force and Navy including Research and Development.

2. This Report includes, among others, reviews on :

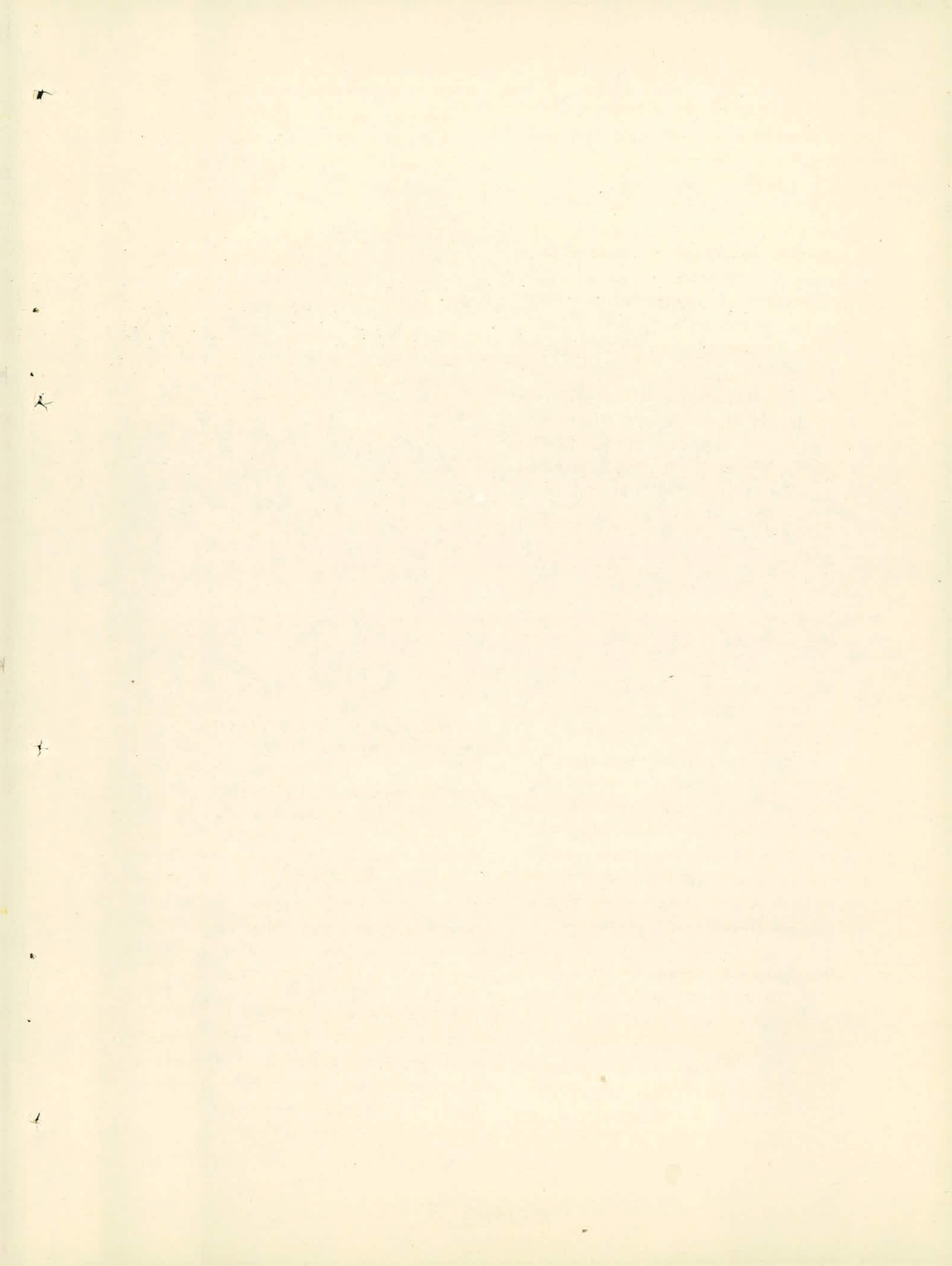
AIR FORCE

- (a) Flight safety
- (b) Light transport aircraft
- (c) Acquisition of weapons for an aircraft
- (d) Base repair depots
- (e) Procurement, manufacture, operation and maintenance of an aircraft

NAVY

- (f) Procurement, operation and maintenance of an aircraft
- (g) Induction of SSK submarine
- (h) Crash local purchase of stores by a project team
- (i) Sanctions for works services

3. The cases mentioned in this Report are among those which came to notice in the course of audit during the year 1988-89 as well as those which had come to notice in earlier years but could not be dealt with in the previous Reports; matters relating to the period subsequent to 1988-89 have also been included, wherever considered necessary.



OVERVIEW

The Audit Report for the year ended 31 March 1989 contains 57 paragraphs including 9 reviews. The points highlighted in the Report are given below:

I. Flight safety

The flight safety programme of the Indian Air Force covers both the determination of causes of aircraft accidents and incidents, and the timely introduction of preventive measures together with their implementation. A review by Audit of certain aspects of flight safety management revealed that a significantly high number of major accidents that occurred during 1983-84 to 1987-88 were due to human error (35 to 42.85 per cent of the total) and technical failure or malfunctioning of components (25 to 50 per cent).

Accidents caused by bird hits ranged between 7.5 and 14.28 per cent out of the major accidents. The fighter aircraft accident rate ranged between 68.25 and 59.31 per cent in respect of major accidents and minor accidents/incidents respectively. For trainer aircraft and helicopters this figure of major accidents was 13.27 and 12.32 per cent respectively. Cases of total loss of aircraft in respect of fighters ranged between 52.63 and 83.33 per cent, 3.84 and 26.31 per cent for trainer aircraft and 7.14 and 17.14 per cent for the helicopter element out of all cases of this nature during 1983-84 to 1987-88. Similarly, fatal accidents were to the extent of 62.96, 18.52 and 12.96 per cent in respect of the fighter, trainer and helicopter respectively.

The factors responsible for human error accidents and incidents were lack of knowledge or skill and experience and attitudinal faults besides inadequacy in training processes.

Monitoring of post accident activities with reference to the recommendations made by the courts of enquiry on operational, tech-

nical or administrative aspects was not very effective in Air Headquarters till April 1988. The unsuitability of existing trainer aircraft and the absence of an advanced jet trainer and simulators were the factors which handicapped the learning process to attain the required standards of operational skills and competence.

An important equipment (cockpit voice recorder) has not been incorporated in the transport fleet so far though its necessity was accepted as early as 1979. Its absence in a large number of aircraft imposed constraints on the proper investigation of accidents and in preventive measures being initiated to control accidents.

The quantum of loss was assessed only to the extent of 30 per cent of the accidents (major and minor) over the five year period which worked out to Rs.419 crores. The loss in respect of the remaining 70 per cent was still to be assessed. The total loss, when assessed, would be substantial.

(Paragraph 6)

II. Light transport aircraft

The process of induction into the Air Force of a light transport aircraft was reviewed in Audit. There was a delay in identification and selection of the aircraft besides the inability of the Air Headquarters to firm up their requirement even after the project was launched in 1983 and the contract for manufacture signed. Even the four aircraft ordered and procured against the requirement of 50 upto 1988-89 had shown poor serviceability. This requirement of 50 aircraft was reduced to 41 in March 1987 and increased to 45 in May 1987 and again reduced to 43 in July 1987. In the case of supply for the Navy, due to the standards of preparation not being finalised until July 1988 and the equipment fit not being finalised as well, the delivery could not

be made. Due to delay in induction of these aircraft, heavy transport aircraft have been mobilised for communication duties, resulting in an avoidable expenditure of Rs.9.67 crores during 1986 to 1988.

(Paragraph 7)

III. Acquisition of weapons for an aircraft

There was a mismatch between the induction of the aircraft into squadron service and that of the weapons required for it. While the contract for the aircraft was concluded in October 1982, the contracts for weapons were concluded after two to three and a half years resulting in inordinate delay in the availability of the weapons. Owing to the delay in the availability of the weapons required for training and instructional purposes, the IAF depended largely upon simulation methods and dummy modes. A single supplier situation prevailed throughout in respect of all weapons.

Price escalation amounting to Rs.57.39 lakhs in foreign currency had to be paid due to delay in finalisation of contracts. An incorrect assessment of the quantitative requirement of a weapon initially and the procurement of an additional quantity subsequently at a higher rate led to an avoidable extra expenditure of Rs.1.12 crores. Owing to the absence of a specific clause in the agreement regarding the period for which the aircraft will be kept with the manufacturer, four aircraft remained with the manufacturer for weapon integration and clearance for long periods leading to deficiency of aircraft in the squadrons.

(Paragraph 8)

IV. Base repair depots

Maintenance support for the Indian Air Force is mainly provided by the base repair depots which undertake the repair/

overhaul of various types of aircraft and associated equipment.

It was seen that the repair work in the base repair depots was carried out without cost considerations. There was extra expenditure on account of uneconomical repairs which worked out to Rs.42.51 lakhs in respect of diesel generating sets and airconditioners in one of the depots. The position of repair work relating to rotables at some depots have not been satisfactory. There have been delays in the setting up of repair facilities at two depots resulting in an expenditure of Rs.48.25 crores on repair jobs abroad. At the same time installed capacity at four depots remained underutilised. Formulation of tasks by Air Headquarters lacked accuracy and realism and restricted the utilisation of available resources in the depots. There were considerable premature failures of repaired items warranting their repair again which involves avoidable expenditure.

There was no monitoring system to analyse the failure pattern of the products by which the situation can be improved upon. No effective monitoring and control over the utilisation of manpower in the depots was being exercised. Consequently, there were unproductive man hours estimated cost of which was Rs.30.37 crores in respect of six depots during 1983-84. 13.71 lakh hours costing Rs.2.40 crores were consumed in excess of the standard labour element fixed for various jobs by Air Headquarters at four depots during the five years ending 1987-88.

The provisioning of materials to meet the production requirements of various depots has not been effective. Inventory control measures were not being implemented effectively. Resultantly, inactive inventory costing about Rs.180 crores had accumulated over the years which involves an avoidable expenditure of approximately Rs.18 crores per annum as its carrying cost.

(Paragraph 9)

V. Procurement, manufacture, operation and maintenance of an aircraft

The review reveals poor planning, project management and implementation. Though Government sanctioned placement of orders on Hindustan Aeronautics Limited (HAL) for the manufacture of aircraft 'B' in October 1982, the order on HAL was placed only in September 1984. This resulted in a delay of over one year in achieving the established rate of production by HAL.

The cost of the project had increased by Rs.237.48 crores and the anticipated savings of Rs.233.86 crores negated. Poor aircraft serviceability affected the utilisation rate and consequential flying efforts. There was considerable shortfall in the flying efforts achieved.

There was a mismatch in the induction of the aircraft and procurement of weapons and training aids. Although the aircraft was inducted in December 1985, the weapons started arriving from the end of 1985 onwards and continued till January 1989. The squadron was without trained personnel to use the specialist weapons till December 1986.

No facilities for repair of aeroengines fitted on a class of aircraft have been set up so far owing to the possibility of HAL taking up the task. Ambiguity on this point had led to delay in initiating action for setting up of overhaul facilities and even the protocol had not been signed with the manufacturers till March 1989, even though expected overhaul arisings of engines commenced from July 1988. Consequently, indents worth Rs.8.96 crores for overhaul of engines and Rs.22.78 lakhs for overhaul of aggregates have been placed with the manufacturers.

(Paragraph 10)

VI. Commissioning of a training simulator

Due to the non-availability of technical instructions and operating manuals, a

simulator imported in December 1983 at a cost of Rs.11.81 lakhs remained non-operational for over five years, after its purchase. The matter was, however, taken up with the supplier only 42 months after the receipt of the simulator. This requires investigation and enforcement of accountability.

(Paragraph 11)

VII. Delay in completion of a training project

A training equipment worth Rs.4.32 crores was received by an Air Force establishment in 1979. As civil works to house the equipment had to be constructed, a payment of Rs.10.40 lakhs was made towards land acquisition in March 1985. The land had not been acquired. Consequently, the equipment had not been used effectively.

(Paragraph 13)

VIII. Procurement of cables for air field lighting

Non-acceptance by Air Headquarters of the technical advice given in September 1983 led to extra expenditure of Rs.9.40 lakhs and delay in procurement of cables required for air field lighting. This also led to inability of units to maintain the serviceability of air field lighting which restricted optimum utilisation of the air field, till supply of cables materialised (September 1988).

(Paragraph 15)

IX. Procurement of air defence equipment

The inadequate appreciation of the total needs of the Air Force resulted in import of only part of the requirement. The system required for optimising the equipment purchased has not been procured so far. This resulted in a sub-optimal utilisation of an investment of Rs.63.25 crores.

(Paragraph 17)

X. Damage to a tower crane

Serious lapses occurred in the inspection and acceptance of a tower crane procured in 1987 at a cost of Rs.25.11 lakhs. Precautionary measures were not provided by the supplier and were not pointed out during the inspection. This resulted in extensive damage to the crane, soon after its purchase. The supplier had already been made full payment and his bank guarantee was also released. Meanwhile, the tasks at the station were being managed by obtaining a crane on loan and by hiring a crane at a cost of Rs.10.50 lakhs. Consequently, the radar installation programme at the station had also slipped seriously and the case revealed laxity in inspection.

(Paragraph 19)

XI. Procurement of night vision goggles

To enhance night operational capability of the helicopter fleet, Ministry of Defence sanctioned in May 1985 import of 25 sets of night vision goggles at a cost of Rs.65.08 lakhs through a Defence laboratory and indigenous development of 35 sets at a cost of Rs.64.5 lakhs. The goggles were procured between July 1986 and September 1988 but could not be put to use till April 1989 due to delays in carrying out the modification in cockpit lighting and lack of training to the crew. The night operation role of helicopter could not, therefore, be practised.

(Paragraph 20)

XII. Brake system of Ajeet aircraft

The brake system for the Ajeet aircraft inducted into the Indian Air Force in April 1978 was developed by a public sector undertaking and accepted by Air Headquarters. The failure to detect defects in the design of the brake system during the extensive trials prior to the introduction of Ajeet aircraft in April 1978 and the delay of ten years in carrying out modifications resulted in losses worth Rs.2.90 crores and extra expenditure of Rs.31.55 lakhs to the state.

(Paragraph 23)

XIII. Induction of a helicopter

In November 1985, Government approved the procurement of the MI-17 helicopter as a replacement for its ageing MI-8 fleet. Although the performance characteristics of the MI-17 were distinct when compared to the MI-8, no Air Staff Requirement was framed and the MI-17 was treated as an improved version of the MI-8.

It was noticed that there were obvious weaknesses in induction planning ranging from a delayed maintenance arrangement to a mismatch between the setting up of the helicopter units, associated civil works and the arrival of the helicopters. The evaluation team of Air Headquarters had omitted to inform the negotiating team that the new helicopter would have to be wired for weapon delivery like the MI-8. As a result an extra expenditure of Rs.2.62 crores was incurred on the modification of the 37 aircraft. Also, two separate contracts for spares had to be concluded at an additional cost of Rs.26.23 lakhs. Training aids not originally provided for had to be procured at an extra cost of Rs.16.65 lakhs.

(Paragraph 25)

XIV. Induction of heavy transport aircraft

In March 1983, Government approved the induction of IL-76 aircraft in the Indian Air Force for its heavy transport requirements. Due to delay in concluding the contract for two aircraft during 1987 an extra expenditure of Rs.2.94 crores had been incurred. Engines were withdrawn for overhaul after completing only 9.05 to 38.15 per cent of their prescribed overhaul life. As a result, the aircraft utilisation rate ranged from 15.35 to 28.26 hours only against the sanctioned utilisation rate of 66 hours per aircraft per month. Consequently, the IAF had to import three additional engines at a cost of Rs.6.36 crores to maintain the operational status of the fleet.

There were also instances of other components such as rotables, gear boxes etc., being withdrawn for overhaul before their prescribed time and cases where components were withdrawn and sent abroad for repairs. Some of these have not been received back.

Although a need for a fleet of 20 aircraft had been planned during the 1985-90 Plan no cost benefit evaluation was done for setting up of indigenous maintenance facility. The expenditure on repair abroad of ten engines prematurely withdrawn for overhaul was Rs.5.71 crores. Ten more engines have further failed which require urgent repairs. Thus, there would appear to be considerable scope for improved induction planning including a strong maintenance element.

(Paragraph 26)

XV. Operation and maintenance of an aircraft

Aircraft 'A' was procured and inducted into service between April 1981 and May 1983 through two contracts concluded in May 1980 and February 1981. Aircraft 'C' contracted for in September 1981 was also inducted into service between May 1982 and July 1983. Thirty five trainer aircraft to be used for both 'A' and 'C' were procured through the May 1980 and September 1981 contracts.

It was seen that there were shortfalls in the authorised flying task of these three aircraft which ranged between 17.87 to 77.97 per cent for 'A', 25.37 to 80.10 per cent for 'C' and 53.86 to 72.86 per cent for the trainer aircraft. The average utilisation rate per aircraft vis-a-vis the authorised utilisation rate was also low ranging from 15.22 to 52.89 per cent for 'A', 22.45 to 78.89 per cent for 'C' and 46.42 to 70.08 per cent for the trainer. The shortfall in respect of the trainers would have adverse impact on pilot training. The expected serviceability percentage of the aircraft was 70. Against this, the achievement was sub-optimal while the aircraft on ground percentage was high ranging from 11.4 to

38.4 per cent. Even this was achieved by resorting to heavy cannibalisation which was due to the unsatisfactory level of production support by the supplier.

Although the setting up of repair and overhaul facilities had been contracted for in 1983, delays occurred in the preparation of detailed project report for these facilities and the associated civil works. The overhaul of aircraft scheduled to commence from May 1984 could not be undertaken. Due to the delayed setting up of these facilities an avoidable expenditure of Rs.38.35 crores was incurred during 1984 to 1988 on repairs abroad.

(Paragraph 30)

XVI. Procurement, operation and maintenance of an aircraft

The Government approved in 1974, procurement of an aircraft from abroad for a dedicated role for the Navy. The basis on which the purchase of used and overhauled aircraft was considered economical and advantageous could not be ascertained as the Ministry stated that the file was misplaced.

Flying efforts and utilisation of the aircraft were affected considerably due to poor availability of the aircraft to the squadron, thereby not achieving the full flying task including training. Additional expenditure of Rs.89.39 lakhs (approximately) had to be incurred in the deputation of foreign specialists as a result of delay in completion of civil works. Manhours prescribed for the scheduled maintenance of the aircraft have never been adhered to and the excess manhours utilised for each maintenance ranged from 110 to 123 percent. Certain systems and communication sets originally fitted in the aircraft were considered inadequate for operational role. These were replaced at a cost of Rs 3.61 crores. Airconditioning plants and chassis procured at a cost of Rs.38.37 lakhs were found to be technically unsuitable for operational use and had to be replaced at a cost of Rs 19.31 lakhs.

There was delay in the setting up of maintenance facilities. This in turn led to an expenditure of Rs.3.34 crores on repair of aircraft components abroad. The repair facilities likely to be ready by March 1991 at a cost of Rs.6.13 crores will finally be under-utilised as the aircraft are due for phasing out between September 1992 and January 1998.

(Paragraph 31)

XVII. Induction of SSK submarines

During 1987, a review was made by Audit on the acquisition of two submarines, two material packages and torpedoes. This was commented upon in Para 55 of the Report of the Comptroller and Auditor General of India for the year ended March 1987. A further study by Audit during 1989 of the indigenous construction of the two submarines and the utilisation of the infrastructure created specially for this construction revealed that the time assessed for construction was grossly underestimated. Delay in taking a decision regarding the future construction of submarines has led to the under-utilisation of the special facilities created at a cost of Rs.44.7 crores for the production of indigenous submarines. There was a mismatch between the receipt of materials and creation of storage facilities. The induction of submarines was not coordinated with the commissioning of related training simulators. An incorrect assessment of spares at the contract finalisation stage resulted in the procurement of Base and Depot spares at a higher cost of Rs.91 crores against the original provision of Rs.32 crores.

(Paragraph 32)

XVIII. Crash local purchase of stores by a project team

A project team was appointed by the Controllerate of Procurement in Bombay for accelerating the process of liquidating pending material demands of the Indian Navy. A review by Audit revealed that the team paid scant regard to the laid down principles of

local purchase and the powers vested in them. It either did not maintain proper records or manipulated them and favoured certain suppliers.

In the purchase of stores worth Rs.98.89 lakhs, an avoidable expenditure of Rs.47.06 lakhs was revealed. Orders worth Rs.2.75 crores were placed on firms which were not on the approved list. It was noticed during test check that in 50 cases worth Rs.6.36 lakhs, the requirement regarding quotations from a minimum number of firms was not observed. Incomplete tender inquiries were issued in 227 cases. In 48 cases the supplies were accepted even before placement of the purchase order. 216 orders worth Rs.25.48 lakhs were placed on unregistered firms for items not under the purview of the team. Failures to quote demand/authority were noticed in 100 local purchase orders worth Rs.12.77 lakhs.

The local purchase order register showed that 5664 orders were placed by the team. However, the numbers reported by the Controllerate of Procurement were only 5469. Only 5069 including 378 cancelled orders were produced for audit.

No assessment was made by either Naval Headquarters or the Ministry of Defence of the extent to which the team's objectives had been met and at what cost. No orders were issued to ensure that such cases do not recur. The role of Controller of Defence Accounts (Navy) in making the payments by neglecting some of the glaring irregularities committed by the team while making the purchases was also questionable.

(Paragraph 33)

XIX. Sanctions for works services

Sanctions issued between 1981-82 and 1986-87 for works services costing Rs.33 crores, though required the sanction of higher authorities, were split up and sanctioned piece-meal to bring the value of sanctions within the financial powers of lower authori-

ties. Certain works services which were specifically prohibited were sanctioned in disregard of Government orders. Works costing Rs.0.65 crore which were not sanctioned in accordance with the regulations and orders, were subsequently cancelled at the instance of Audit. Non-observance of regulations, orders and instructions by Naval authorities while sanctioning various works were also noticed.

(Paragraph 34)

XX. Training of Naval pilots

In 1986-87, eight aircraft were acquired at a cost of Rs.7.60 crores to provide necessary training and experience in aerobatics to Naval pilots. The first line servicing facilities were also set up at a cost of Rs.1 crore. Only 13 pilots were trained in 1987. Due to lack of volunteers, no training has been imparted thereafter. As a result, the investment of more than Rs.8.5 crores has remained largely infructuous.

(Paragraph 35)

XXI. Construction of residential accommodation in Bombay

Accommodation was constructed in Bombay for officers and sailors of the Indian Navy in 1987-88. However, the accommodation could not be put to use. This was due to the Navy not obtaining prior clearance from the Municipal authorities. As a consequence, the officers and sailors had to be accommodated in hired buildings and additional expenditure had to be incurred on hire charges, house rent allowance etc., apart from the accommodation constructed at a cost of Rs.3.37 crores remaining unutilised.

(Paragraph 36)

XXII. Designing a dry dock

Extension of the submarine compartment in a Naval dry dock from a length of 100 to 240 metres was completed in March 1985. This included construction of a monolith at a cost of Rs.16.03 lakhs which functioned as a

headwall. This monolith had to be demolished at a cost of Rs.11.21 lakhs to further extend the compartment to 272 metres to accommodate the needs of a special project. Since the detailed project report for the special project was already under preparation at that point of time, the construction and subsequent demolition of the monolith has resulted in an avoidable expenditure of Rs.27.24 lakhs. This indicates the need for instituting better planning processes to avoid recurrence of such cases.

(Paragraph 37)

XXIII. Setting up of a Naval aviation enclave at Meenambakkam

While the development of the Naval Air Station at Arkonam was in progress, the Navy planned in 1981 to set up a Naval aviation enclave at Meenambakkam close to Arkonam, when the Arkonam station itself would have been able to provide all the required facilities. An investment of Rs.152 lakhs will, therefore, have doubtful utility. Additionally, there will be a recurring avoidable expenditure of Rs.8.32 lakhs per annum towards lease charges payable to International Airports Authority of India. The planning deficiencies together with the absence of the Ministry's administrative approval to the works even after a lapse of above six years requires investigation.

(Paragraph 38)

XXIV. Construction of VVIP accommodation in violation of delegated powers

In the Headquarters of a Naval Command the top two floors of a six storey building, sanctioned for construction in December 1980 at a cost of Rs.46.10 lakhs, were converted to VVIP and VIP accommodation by additions and alterations at a cost of Rs.17 lakhs. As the basic requirement of security and fire hazards were not looked into at the time of conversion, this accommodation could

not be utilised for VVIPs. This led to the construction of another set of VVIP accommodation at a cost of Rs.19.06 lakhs, which was in contravention of powers delegated to the Command.

(Paragraph 41)

XXV. Purchase of blowers for a ship

As an urgent operational requirement for undertaking the refit of a Naval ship, offers were obtained from a firm abroad for two forced draught blowers in August 1984. The offers were valid up to January 1985. Due to failure to pursue the offer effectively within the validity period, the Navy had to incur an extra expenditure of Rs.13.99 lakhs on procuring the blowers through fresh offers in September 1985.

(Paragraph 45)

XXVI. Procurement and utilisation of hydrographic survey equipment

For drawing of accurate and high resolution charts for navigation purposes, the Naval Headquarters required the installation of imported geodetic satellite survey systems in its survey ships under construction. The requirement was stated to be urgent as the installation was to be completed before the commissioning of the ships.

The equipment was acquired between May 1980 and March 1989 at a cost of Rs.208.87 lakhs. In these purchases, an Indian agent of a foreign firm was paid a commission of Rs.19.54 lakhs against the maximum permissible commission of Rs.1.09 lakhs. Delays in commissioning the ships resulted in delays in installation of the systems. Meanwhile, the Central Processing Units of the computers were returned to the supplier, for obtaining updated version, in October 1980. Delay in obtaining Government sanction for procurement of the updated Central Processing Units resulted in an extra expenditure of Rs.17.10 lakhs exclusive of transportation cost. Meanwhile, the survey systems installed

in the ships could not be fully exploited without these computing systems.

(Paragraph 46)

XXVII. Procurement of rocket launchers

In April 1974, Government had approved the procurement of a certain type of rocket launchers for fitment on a certain class of ships. A contract was concluded in April 1975 for the launchers and spares and test equipment. Although the firm had quoted for supply of ammunition as well, the contract did not provide for this. Consequently, a separate contract had to be concluded with the same firm in March 1977 for the supply of ammunition at an additional cost of Rs.1.09 crores. A second test equipment was procured in February 1986 at a cost of Rs.29.48 lakhs although the volume of work did not justify the purchase.

(Paragraph 47)

XXVIII. Receipt of a damaged machine

A machine ordered in October 1984 at a cost of Rs.7 lakhs was received in July 1985 in a damaged condition. Even four years after its receipt, the machine was not repaired nor was the insurance claim settled. In the absence of the machine, the Naval Dockyard had to undertake urgent operational jobs by makeshift arrangements.

(Paragraph 49)

XXIX. Engine modification on Kamorta class ships

There was absence of timely review arrangements in the procurement process of modification kits for upgrading the ships' engines. This resulted in an avoidable expenditure of Rs.42.07 lakhs in the procurement of modification kits although the ships themselves for which these were being acquired, were in the process of being phased out.

(Paragraph 51)

XXX Development of an integrated Air Defence System

Based on the firm requirements of the Air Force and Navy in early 1983 the Defence Research and Development Organisation took up the work in March 1985 for a project definition, leading to the preparation of a detailed project report for an integrated air defence system without adequate appreciation of the full financial and technical implications. This included the setting up of 43 schemes to

establish the data base for the required technology. Out of the 43 schemes only 17 had been completed until June 1989 and the remaining 26 schemes were scheduled to be completed by March 1990. The detailed project report for the whole project was not prepared and cabinet approval for continuance of the project was not forthcoming. The expenditure of Rs. 14.82 crores so far incurred on the 43 schemes would, therefore, be largely unproductive.

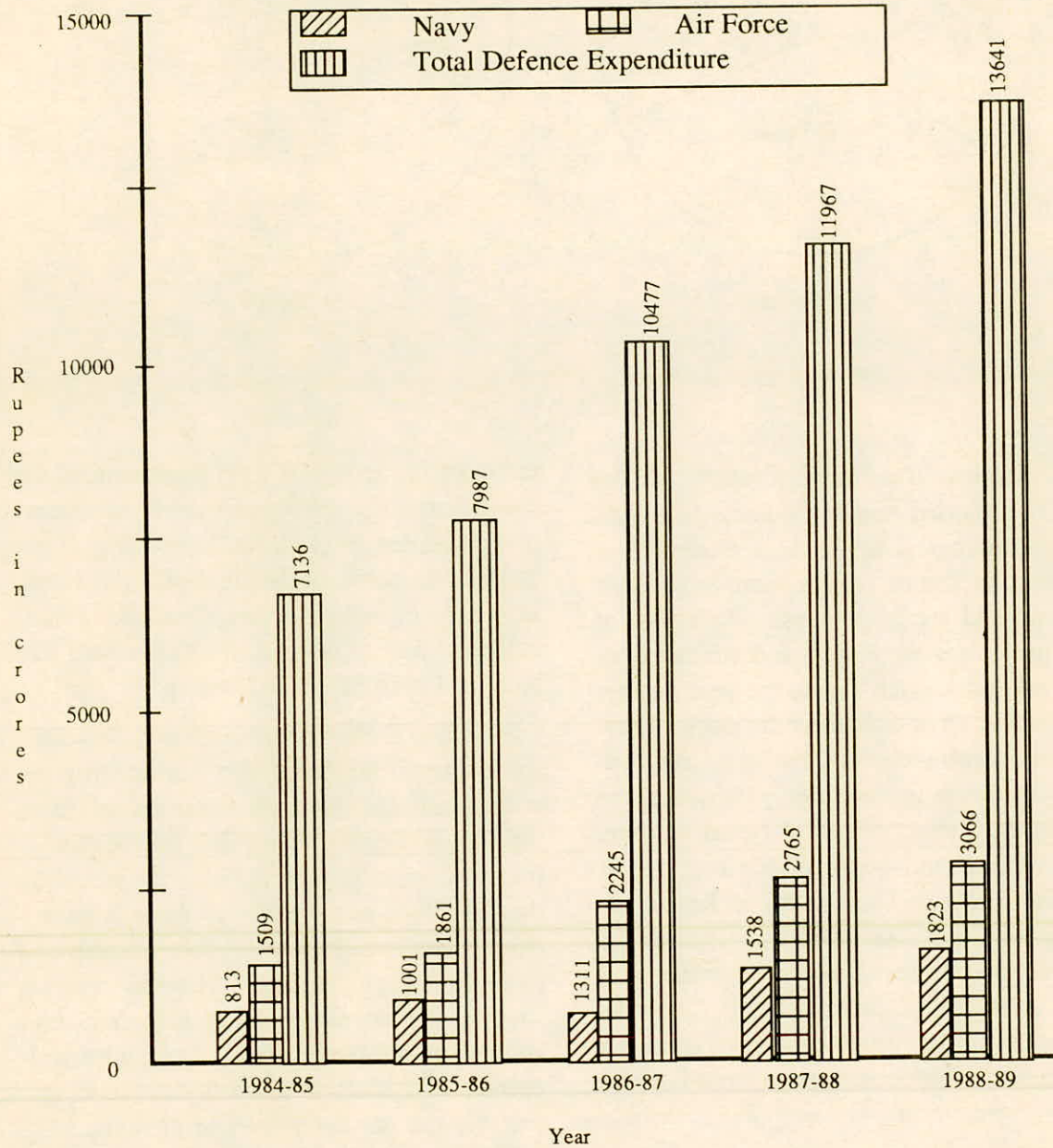
(Paragraph 53)

CHAPTER I FINANCIAL OUTLAY

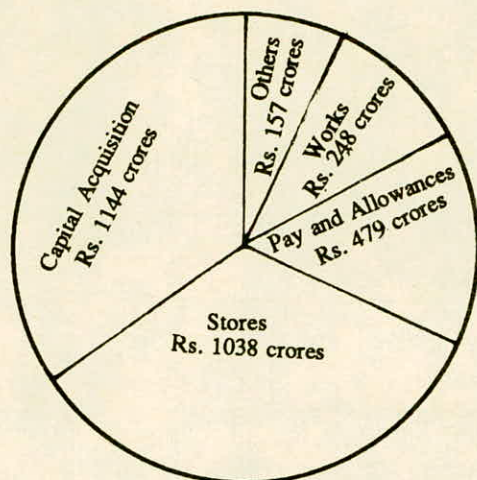
1. Financial outlay

1.1 The outlay on Defence has grown from Rs. 7136 crores in 1984-85 to Rs.13641 crores in 1988-89. The share of the Air

Force and the Navy in the total outlay has also registered a steady growth as indicated below:

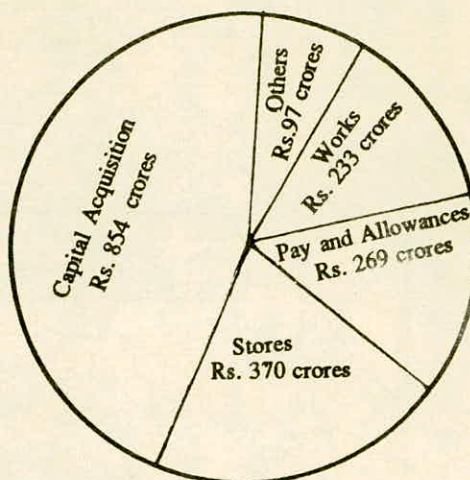


1.2 The proportion of the outlay on these services on capital acquisition, stores, pay and allowances and civil works for the year 1988-89, is indicated in the pie chart below:



Air Force

includes the induction of highly sophisticated and advanced technology multirole aircraft and modern weapons, modification of existing aircraft for multirole purposes, strength-



Navy

1.3 Projects for modernisation of the Navy in a phased manner to keep pace with rapid technological advances in modern warfare and its future requirement have been taken up and are in progress. As a part of these projects, new vessels and aircraft were inducted into service during the year besides commissioning of a floating dry dock. Creation of new infrastructural facilities, augmentation of training facilities, including the opening of a new college of Naval warfare, augmentation and modernisation of repair facilities in Naval Dockyard and Repair organisation were also taken up. Project for construction of a new Naval Base in the West Coast is in the preliminary stage. Works relating to the setting up of a new Naval Air Station in the East coast are in the advanced stages of execution.

1.4 Re-equipment of the Air Force with a variety of modern aircraft, stores and weapons is progressing in a planned manner. This

ening of the transport fleet, augmenting the helilift capacity, enhancing the communication facilities as well as improving flight safety measures. In the field of flight safety new training schemes for pilots and technical personnel have been introduced and five technical training schools set up.

1.5 The Defence Research and Development Organisation, besides taking up projects of benefits common to all the wings of the Armed Forces, also takes up projects to meet the specific requirements projected by the Air Force and the Navy. Four laboratories are dedicated to Air Force research and three to Naval research. Diverse projects such as the development of torpedoes and sonars for the Navy and design and development of a multi mission light combat aircraft for the Air Force are in full swing.

1.6 The increased spending on the Navy and the Air Force as a part of the overall increase in the outlay on Defence was directed

towards the modernisation of these forces to enable them to effectively counter any threat to security. The thrust was for providing them with enhanced mobility and fire power, improved surveillance techniques, increased fighting capability and improved communications. The full scope of benefits anticipated would accrue only when the projects are properly planned and effectively implemented.

1.7 However, Audit during the test check had noticed a number of cases where planning was weak, monitoring was either not regular or adequate, implementation was delayed and intended benefits did not accrue at the appropriate time. There were instances where stipulated rules were ignored while sanctioning expenditure.

CHAPTER II

MINISTRY OF DEFENCE

2. Recovery of training charges from foreign governments

Training of armed forces personnel of other countries in Indian Defence training establishments is authorised subject to the recovery of training and allied charges from the foreign governments at rates prescribed by Government of India from time to time. The details of recoveries to be effected are communicated by the training establishments concerned to the respective Controller of Defence Accounts (CDA) who, after verification of the details, forwards it to the Ministry of External Affairs (MEA) for arranging recovery from the foreign governments concerned.

Till March 1989, an amount of Rs. 6.98 crores in foreign exchange was outstanding from 16 foreign governments towards charges for such training imparted by the Navy and the Air Force. The training charges outstanding related to the period 1959-60 to 1987-88. The details of amounts outstanding were:-

	Air Force (Rs. in lakhs)	Navy
Upto 5 years	307.86	182.59
5 to 10 years	195.63	5.08
10 to 20 years	0.11	0.52
Beyond 20 years	0.45	5.60
Total	504.05	193.79

There were delays in the adjustment of training charges which had been paid by the foreign governments. An amount of Rs.210.43 lakhs was due towards training charges from a foreign government which included Rs.5.28 lakhs pertaining to the Navy and the Air Force. Under an arrangement reached between the foreign government and Government of India, the payment was agreed to be made in 30 equal instalments, 19 of which had been paid upto 1988. How-

ever, the amount outstanding against the Air Force and the Navy had not been adjusted upto March 1989.

Further, cheques valued at Rs.1.89 lakhs were received from two other governments between September 1985 and May 1987 but were not encashed within their validity periods.

To improve the situation, the Ministry of Defence (Ministry) had issued a revised procedure in October 1988, as amended in January 1989, to provide for advance payment of the training charges by the governments of countries coming mainly under the self-financing scheme. The Ministry expected an improvement in the system with the implementation of the new procedure. Another order was issued in March 1989 relating to countries under the Indian Technical and Economic Cooperation programme authorising expenditure from the Defence Services establishments and its subsequent refund by the MEA. In either case, the revised procedure does not provide for any change in the system to expedite outstanding recoveries. MEA stated in February 1989 that the main problem in the settlement of the Naval training bills has been the astronomical increase in the tuition charges by 300 to 600 per cent by the Navy retrospectively with effect from December 1985.

The Ministry of Defence stated in August 1989 that "there is very little that the Ministry of Defence can do to ensure the payments of outstanding dues beyond taking up the issue with the Ministry of External Affairs". It also added that MEA had been requested to take steps to liquidate dues prior to December 1985.

The case reveals the need for a review of procedures so as to ensure prompt recovery of such charges in the future and the immediate recovery of outstanding charges.

3. **Delay in revision of handling charges for explosives**

The Navy undertakes handling of all explosives at ports including the technical supervision of their loading and unloading, repacking, repairing and demolition and their despatch to the ultimate consignee. The charges on account of such services to private firms and public sector undertakings are recovered at rates fixed by the Ministry of Defence (Ministry) from time to time.

Mention was made in paragraph 51 of the Report of the Comptroller and Auditor General of India, Union Government (Defence Services) for 1982-83, regarding the loss of Rs.105.29 lakhs due to delay in the revision of handling charges. The Ministry attributed the delay in August 1983 to the absence of an escalation formula for automatic revision of rates.

The handling charges fixed in 1975 were revised in March 1984 with a provision for annual revision which was subsequently amended in July 1984 to provide for an annual increase of 10 per cent till the rates are revised; the increase to be effective from 1st April of each year.

At the instance of Naval Headquarters(HQ), proposals for the revision of handling charges were sent by the Naval Armament Depot (NAD), Bombay in August 1984, July 1986 and October 1987 based on actual and forecast costs. Instead of the handling charges being revised, based on actual costs those fixed in March 1984 were increased by 10 per cent per year. On the basis of the difference in the rates between those proposed for revision and the 10 per cent escalated handling charges, the avoidable loss of revenue was Rs.9.33 lakhs in respect of explosives handled by the Navy at the Bombay and Cochin ports. The charges were finally revised by the Ministry in January 1989 to be effective from April 1989 with a provision of ten per cent cost escalation each year.

It was seen that the Ministry were aware, from August 1984 that the charges based on 10 per cent annual escalation were inadequate in terms of actual costs incurred by the NAD. In spite of this, the rates were revised only in 1989. The delayed action of the Ministry has resulted in a loss of revenue and an unauthorised avoidable subsidy being provided to private parties. The Ministry stated in September 1989 that the delay in revision of charges was mainly due to the time taken in getting all the inputs and working out the proposal. It added that the proposal had to be reworked due to the pay hike by way of the 4th Pay Commission's recommendations and that the case should be considered as an isolated instance on this account.

Since actual costs were always in excess of those anticipated, the rates could have been published based on August 1984 and July 1986 proposals, without waiting to work out the effect of the Pay Commission recommendations.

4. **Consumption scales for cooking gas**

In December 1969, the Ministry of Defence (Ministry) sanctioned the provision of a gas cooking range for the Cadets Mess at the Air Force Academy, Hyderabad (Academy). The Cadets Mess was using firewood at a scale of 1.40 kilogrammes per cadet per day. It had started using liquid petroleum gas (LPG) from May 1971. Initially, the issue of LPG was on an as required basis. Subsequently, in 1972, a Board of Officers recommended a scale of 500 grammes of LPG per cadet per day on the basis of experience gained over a period of 10 months. The scale fixed by Government for similar cadet messes at the National Defence Academy (NDA) and the Officers Training School, Madras, (OTS), was 225 grammes while for the Naval Academy at Cochin it was 110 grammes per cadet per day. Similarly for messes of troops and service officers the au-

thorisation of LPG is 95 grammes per head per day. The Academy, however was consuming 500 grammes LPG per cadet per day. This was objected to by the internal audit in February 1986.

In May 1986, Air Headquarters instructed the Academy to restrict the use of LPG to 225 grammes per cadet per day. Finally, after 17 years of the change over to LPG, the Ministry issued a sanction in November 1988 laying down a scale of 225 grammes per cadet per day. The delay in fixing the scale had resulted in an extra expenditure of Rs.6.98 lakhs during May 1971 to May 1986.

The Ministry stated in August 1989 that the scale of LPG differed from one Academy to the other based on factors like the peculiarity of training programme affecting the common meal timings, climate of the place and variation in ration scales for the three Services. This is not tenable as the scales for firewood were uniform at 1.4 Kg per cadet per day for the cadets messes at the NDA, OTS, Indian Military Academy and Naval Academy.

The case reveals

- a failure in not fixing the scale of consumption for the Academy while sanctioning the use of LPG in December 1969.
- failure on the part of internal audit to detect for over fifteen years the adoption of a scale which was more than double of that sanctioned for similar institutions.
- the absence of uniform scales for similar institutions.

5. Recoveries at the instance of Audit

A test check of the accounts maintained by the Defence Accounts Department (DAD) and the pay and accounts offices manned by the Air Force and the Navy, resulted in recoveries worth Rs.10.96 crores and Rs.56.97 lakhs for the Air Force and

the Navy respectively between 1983-84 and 1988-89. Of this, recoveries to the extent of Rs.5.11 crores pertained to 1988-89. The overpayments and short recoveries related to pay and allowances, provident fund accounts, travelling allowance claims and contract payments. The recoveries were basically due to wrong calculations by DAD and the Air Force and Navy besides incorrect interpretation of rules.

Air Force

An overpayment of ad hoc bonus worth Rs.5.75 lakhs to Air Force personnel in 1985-86 was pointed out by Audit in November 1985 and its recovery effected subsequently by the Air Force Central Accounts Office. The overpayment was due to incorrect interpretation of rules on the subject.

During the audit of various bills of a public sector undertaking, several cases of overpayments were pointed out. The Controllers of Defence Accounts concerned had agreed to recover overpayments worth Rs.10.89 crores during 1983-84 to 1988-89. In addition, acceptance of overpayment pointed out in April 1988 of Rs.75.36 crores by Audit was awaited from the Defence Accounts Department.

Navy

Out of the overpayments of Rs.56.97 lakhs pertaining to the Navy, Rs.54.16 lakhs were in respect of contractors' bills. In September 1987 a public sector undertaking preferred a claim for Rs.67.65 lakhs on account of procurement of spares for servicing Naval helicopters. The Controller of Defence Accounts (Navy) admitted it and made payment. In August 1988, it was noticed during the audit of the payment vouchers, that only Rs.13.58 lakhs were due to the undertaking against its claim for Rs.67.65 lakhs. The consequent overpayment of Rs.54.07 lakhs was recovered by the Controller of Defence Accounts (Navy) in September 1988. However, no interest was recovered for the

amount incorrectly claimed and retained for a year.

During 1987-88, overpayments of pay and allowances and bonus worth Rs.2.30 lakhs were pointed out by Audit. Of these, Rs.1.34 lakhs have been recovered. The rest had not been recovered (November 1989).

These cases, illustrate the need for tighter internal control to be exercised by the Defence Accounts Department and the Air Force and Navy.

The matter was referred to the Ministry in July 1989; reply has not been received (November 1989).

CHAPTER III

AIR FORCE

REVIEWS

6. Flight Safety

6.1 Introduction

The determination of causes of aircraft accidents and incidents and the timely introduction of preventive measures together with their implementation constitute the core of the IAF's flight safety programme.

An aircraft accident is an occurrence not directly caused by enemy action which involves one or more aircraft resulting in injury to persons or damage to aircraft and property. It can happen in the air or on the ground. Accidents are categorised as "major" or "minor" depending upon the extent of damage sustained. An occurrence which does not result in any damage to an aircraft or property or injury to persons but is considered worth reporting in the interest of flight safety and accident prevention is termed an "incident". Each accident or incident, wherever necessary, is investigated into by an independent court of inquiry consisting of specialists from various fields. Its proceedings are required to be completed within 31 working days. The primary objective of investigation is to obtain factual information about the cause of the accident or incident so as to initiate preventive measures and avoid recurrence.

Aircraft accidents which occurred between January and June 1966 were commented upon in paragraph 17 of the Audit Report (Defence Services) 1967. Similarly, accidents that took place during 1970 to 1975 were examined and reported upon in paragraph 51 of the Report of the Comptroller and Auditor General of India, Union Government (Defence Services) for 1974-75.

6.2 Scope of Audit

Aircraft accidents which occurred during 1983-84 to 1987-88 were analysed by Audit. The review includes certain as-

pects of flight safety management and training efforts in the Air Force as well as the organisational set up to deal with flight safety issues.

6.3 Organisational set up

An Inspectorate General (Inspection and Safety) at Air HQ coordinates the functions of the Institute of Flight Safety, Directorate of Flight Safety and the Aircraft Accident Investigation Board. At the command and station level, a flight safety section keeps statistical records of accidents and incidents among other items of work.

6.4 Highlights

- **A significantly high number of major accidents that occurred during 1983-84 to 1987-88 were due to human error (35 to 42.85 per cent of the total) and technical failure or malfunctioning of components (25 to 50 per cent). Accidents caused by bird hits ranged between 7.5 and 14.28 per cent out of the major accidents.**
- **The fighter aircraft accident rate ranged between 68.25 and 59.31 per cent in respect of major accidents and minor accidents/incidents respectively. For trainer aircraft and helicopters this figure of major accidents was 13.27 and 12.32 per cent respectively.**
- **Cases of total loss of aircraft in respect of fighters ranged between 52.63 and 83.33 per cent, 3.84 and 26.31 per cent for trainer aircraft and 7.14 and 17.14 per cent for the helicopter element out of all cases of this nature during 1983-84 to 1987-88. Similarly, fatal accidents were to the extent of 62.96,**

18.52 and 12.96 per cent in respect of the fighter, trainer and helicopter respectively.

- The factors responsible for human error accidents and incidents were lack of knowledge or skill and experience and attitudinal faults besides inadequacy in training processes.
- The quantum of loss was assessed only to the extent of 30 per cent of the accidents (major and minor) over the five year period which worked out to Rs.419 crores. The loss in respect of the remaining 70 per cent was still to be assessed. The total loss, when assessed, would be substantial.
- Monitoring of post accident activities with reference to the recommendations made by the courts on operational, technical or administrative aspects was not very effective in Air Headquarters till April 1988.
- The unsuitability of existing trainer aircraft and the absence of an advanced jet trainer and simulators were the factors which handicapped the learning process to attain the required standards of operational skills and competence.
- An important equipment (cockpit voice recorder) has not been incorporated in the transport fleet so far, though its necessity was accepted as early as 1979. Its absence in a large number of aircraft imposed constraints on the proper investigation of accidents and in preventive measures being initiated to control accidents.

6.5 Institutional arrangements

The Directorate of Flight Safety was set up in 1960 at Air Headquarters to look into aircraft accidents throughout the Air

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Force centrally. This organisation worked on a purely ad hoc basis and Air Headquarters stated in May 1984 that its establishment was not commensurate with the work load and commitments. According to the Ministry (October 1989), the main item of work that suffered due to lack of proper establishment was keeping of records of follow up action on various recommendations made by courts of inquiry and study teams.

In 1967-68, the Public Accounts Committee in its 15th Report (Fourth Lok Sabha) had suggested on the basis of examination of paragraph 17 of the Audit Report (Defence Services) 1967, that a periodical analysis of the reasons for accidents with a view to taking timely corrective measures be undertaken. The suggestion was accepted by Government and in January 1973 an Aircraft Accident Investigation Board (Board) was sanctioned for the exclusive task of specialised investigation into serious aircraft accidents. The total strength of the Board was 15 specialised officers and staff from various fields who constituted five core teams.

In September 1980, 11 specialised officers and staff were deployed from the Board to form the Institute of Flight Safety which was to impart training and education in flight safety, to conduct research and analysis in respect of accidents, occurrences and hazards to flight safety and to prepare and disseminate information material on flight safety. Investigations into aircraft accidents were not assigned to the Institute. Consequently, the two core teams available in the Board found it extremely difficult to cope with the task of accident investigation. Although Air Headquarters proposed to restore the composition of the Board in May 1984, no final decision had been taken.

The Ministry stated in October 1989 that the specialised investigation in serious accident cases was arranged by deploying other specialist officers available with the Air Force. It added that standards of investigation were not allowed to suffer. At the same time, it stated that teams from the Air-

craft Accident Investigation Board were not able to assist the investigations for full duration on account of shortage of staff. Also, it stated that the Institute of Flight Safety has important tasks of their own and the duties of the Aircraft Accident Investigation Board cannot be assigned to them. Further, in the light of the Ministry's comment that "the original composition of the Aircraft Accident Investigation Board can only be restored when Government ban on creation of new posts/establishment is lifted" there would appear to be need for reviewing the flight safety tasks assigned to various agencies so as to make the Aircraft Accident Investigation Board fully effective.

An Inspectorate General (Inspection and Safety) at Air Headquarters sanctioned in January 1986 and established in April 1986 was to look into safety aspects of maintenance and administration of all formations and units of the Air Force apart from maintaining standards of training at various training institutes. As per the Annual Report of the Ministry (1986-87) the Inspectorate was also to set standards and qualifications of skill levels with a view to developing and maintaining a close nexus between training establishments and operational units to ensure that the training processes remained dynamic and met the changing requirements of operational units. The Directorate of Flight Safety and the Institutes of Flight Safety were brought under the functional control of the Inspectorate General.

6.6 Implementation of La Fontaine Committee recommendations

The La Fontaine committee on flight safety which investigated aircraft accidents that occurred between April 1977 and August 1982 indicated three major reasons as follows:

- material failure including component malfunctioning 43 per cent
- human error 41 per cent
- bird strike 11 per cent
- others 5 per cent

Material failure was ascribed, besides other factors, to the practice of cannibalisation (transfer of components from unserviceable aircraft to compensate for shortage in spares supply) and human error in the maintenance or fitment of components during the process.

Human error accidents relating to both pilots and ground crew were held to be on account of lack of knowledge or skill and attitudinal faults. Air crew accidents were also as a result of the training processes either in quality or quantity. The committee considered that training systems were significantly inadequate and left undesirable gaps in flying training during formative periods. Also, deficiencies and shortcomings existed in training resources leading to limitations being imposed on the training processes. The scales of training aids at flying establishments had not been amended for more than two decades and the non-availability of simulators had also had a negative impact on the training processes. It recommended considerable improvements in the correct definition of training aims and standards to be reached, appropriateness of syllabus and equipment used, course scheduling and independent evaluation against defined standards so as to control the accident rate. It also commented on the inadequacies of existing trainer aircraft which restricted the achievement of desired professional skills. While the Ministry admitted (October 1989) that lack of experience, attitudinal faults and poor residual capability in the face of an emergency were major factors in human error accidents, they stated that lack of knowledge and inadequacies in training could not be responsible for many human error accidents.

The La Fontaine committee in its Report stated that in the period under investigation by the committee 58 per cent (66 per cent of them were cat. I) of the accidents were attributable to lack of knowledge/skill, these were isolated by the committee as it was felt "conceivably that the system

was at fault for inadequately preparing the aircrew or ground crew concerned for the execution of their task ". It was also seen that the study team report of 1987 also isolated skill/knowledge deficiency as one of the five aspects leading to the human error accidents.

6.6.1 Major accidents and incidents

Audit collected data with regard to accidents and incidents that occurred between 1983-84 and 1987-88, which are given below.

	Accidents/Incidents (per cent)	
	Major	Minor
Fighter aircraft	68.25	59.31
Trainer aircraft	13.27	21.20
Helicopters	12.32	6.96
Transport aircraft	6.16	11.96
Other aircraft	-	0.57

In terms of cases of major accidents during the same period, human error either due to negligence or culpable default or due to inexperience or error of judgement, contributed to between 35 and 42.85 per cent during 1983-84 to 1987-88 of the total major accidents. Technical failure and component malfunctioning ranged between 25 and 50 per cent and bird hits were between 7.5 and 14.28 per cent during the same period. Accidents due to miscellaneous causes ranged between 7.5 and 25 per cent.

6.6.2 Cases of total loss of aircraft

In those cases where the total loss of aircraft was involved, the share of fighter aircraft was the maximum. It ranged from 52.63 per cent in 1983-84 to 83.33 per cent in 1987-88. Trainer aircraft were also affected during this period and total losses in these cases ranged between 3.84 per cent in 1985-86 to 26.31 per cent in 1983-84. Helicopters, too, have been seriously affected with losses ranging between 7.14 per cent in 1987-88 and 17.14 per cent in 1986-87.

Of the fatal accidents, fighter aircraft were involved in 62.96 per cent cases, trainers to the extent of 18.52 per cent and helicopters 12.96 per cent during this period. The percentage of fatal accidents to total major accidents was 25.59 per cent.

6.6.3 Delay in assessment of loss

Losses in respect of 70 per cent of the accidents which occurred during 1983-84 to 1987-88 have not yet been assessed by the repair agency. In those cases where the loss had been assessed (an average of 29.8 per cent over the five year period) the amount of loss was Rs.419 crores. Of this, Rs.409.03 crores was in respect of major accidents and Rs.9.98 crores for minor accidents. An analysis of losses assessed according to important causes of the accident is given below:

	(in lakhs of Rupees)									
	1983-84		1984-85		1985-86		1986-87		1987-88	
	major accident	minor accident	major accident	minor accident	major accident	minor accident	major accident	minor accident	major accident	minor accident
due to culpable default, experience/error of judgement	496.53	0.19	5046.87	4.76	2395.52	14.70	3870.23	13.17	5015.06	20.55
technical defect/malfunctioning	911.26	45.16	2051.14	41.20	1239.50	57.25	1484.36	3.36	5740.16	76.32
unavoidable (bird hits/tyre burstsetc.)	3043.18	105.43	865.35	82.02	460.60	118.08	1032.08	129.21	721.71	38.65
miscellaneous	43.04	10.86	202.47	12.97	470.12	83.79	2722.10	105.37	3090.90	35.09
	4494.01	161.64	8165.83	140.95	4565.74	273.82	9108.77	251.11	14567.83	170.61

The quantum of loss in respect of accidents, when assessed, would be obviously substantial. Of the assessed cases, action for regularisation of loss was awaited to the extent of 31.14 per cent. It was noticed that the delay in regularisation ranged between nine months and eight years. The Ministry stated in December 1989 that the main reasons for the delay in regularisation of losses were :

- delay in getting the cost of damage from repair agency
- delay in obtaining loss statements from units
- action pending on some recommendations of the court of inquiry
- non-finalisation of disciplinary or administrative action against blameworthy individuals.

Some of these reasons are similar to those indicated in para 51 of Comptroller and Auditor General's Report, Union Government, Defence Services, 1974-75 which dealt with losses due to aircraft accidents. It is a matter of concern that no appreciable improvement has been possible even after 15 years. These aspects would require to be viewed by Government with the objective of eliminating delays.

6.6.4 Pilot error accidents

A study conducted by Air HQ in August 1987 relating to pilot error accidents involving senior pilots ascribed most of the accidents to pilot error as a result of knowledge deficiencies or pre-occupation of supervisors. Other contributory factors were:

- non-availability of standard operating procedures for flying
- unrealistic instrument for flying training
- non-standardisation of emergency actions in trainer aircraft
- low levels of maintenance of ground control approach radar and non-directional beacon aids
- poor serviceability of air traffic con-

trol radars.

Of the total accidents which occurred due to pilot error during the period between 1976-77 and 1987-88, 51.6 per cent were due to lapses on the part of senior and experienced pilots and the remaining 48.4 per cent due to lapses on the part of inexperienced and junior pilots. Insufficient attention paid by the senior and experienced pilots to improve upon their own skills in basic flying, adoption of incorrect emergency procedures and a general shortage of supervisors in squadrons were responsible for the high percentage of pilot errors. Accidents arising out of this factor were, thus, largely avoidable. The Ministry stated in October 1989 that no country in the world has been able to do very much towards eliminating pilot error accidents.

6.6.5 Analysis of major accidents

The percentage of major accidents under various categories during 1983-84 to 1987-88 when compared to accidents during April 1977 to August 1982 is indicated below:

	Percentage of accidents on account of			
	Human error	Material failure	Bird strikes	Other causes
During April 1977 to August 1982	41	43	11	5
During 1983-84 to 1987-88	38.49	35.54	11.37	14.69

The Ministry stated in October 1989 that what really matters is the rate (number of accidents per 10,000 hours of flying) and not the number of accidents or their percentage-wise distribution. It stated that except for a slight upward trend during 1987-88, the accident rate has shown a significant downward trend since 1982-83. It stated further that the kind of remedial measures pertaining to training, which were taken after the Committee Report, usually take a long

time to show positive results.

6.6.6 Advanced jet trainer

Although the committee had recommended an advanced jet trainer, the IAF is yet to be provided one. Air Headquarters stated in July 1988 that Hunter and MiG 21 trainers are currently being used although they are not specifically designed as advanced jet trainers. It added that design limitations on the MiG 21 trainer made it necessary to procure an advanced jet trainer specifically designed. Thus, the unsuitability of existing trainer aircraft and the absence of an advanced jet trainer and simulators were the factors which handicapped the learning process to obtain the required standards of operational skills and competence.

6.6.7 Delay in installation of cockpit voice recorders

The non-availability of cockpit voice recorders in transport aircraft imposed constraints on the proper investigation of accidents and incidents and the institution of effective preventive measures. Its necessity in the transport and logistic fleet was accepted in December 1979. The proposal, mooted in December 1981, was approved only in 1986 and a contract for the procurement of 243 sets finalised with an indigenous source of supply in April 1986 at a cost of Rs.5.74 crores. Although delivery of 40-48 sets per year was to commence from June 1987, only 58 sets had been received by the IAF upto September 1989. According to the Ministry, the remaining 185 sets were scheduled for delivery progressively by 1993. Thus, an important flight safety equipment whose necessity had been recognised as early as in 1979 had not yet been fully incorporated in the IAF transport fleet (October 1989).

6.7 Accident investigations

None of the courts of enquiry in respect of major accidents that occurred between 1983-84 and 1987-88 were completed

during the stipulated period of 31 working days. The time actually taken ranged from 2 to 14 months with 44.7 per cent of the cases being completed within two to four months and 23.96 per cent cases between four and six months. There were similar delays in respect of investigations into minor accidents and incidents.

The Ministry maintained in September 1989 that this time schedule was not realistic and that it should be two to three months. It intended to revise the existing schedule suitably in the near future.

6.8 Monitoring

The Director of Flight Safety is required to monitor action taken by the agency concerned on the recommendations made by the courts on operational, technical and administrative aspects. However, no information was available centrally with the Directorate to indicate action taken with reference to various fields. According to the Ministry, no separate cell was in existence for monitoring the follow up action till March 1988. It was, however, established on 1st April 1988.

7. Light transport aircraft

7.1 Introduction

In order to carry out the logistic tasks and enhance the operational efficiency of the Air Force (IAF), a need for a Light Transport Aircraft (LTA) to replace the existing squadrons of Devon and Twin Otter aircraft was accepted by Government in June 1978. The LTA was also required by the Indian Navy (Navy) primarily for carrying out low speed work for Naval ships and observer training with limited maritime and anti poaching patrol capabilities for the defence of islands and communication duties. In August 1983, Government sanctioned the project for the manufacture under licence of Dornier aircraft by Hindustan Aeronautics Limited (HAL). The aircraft is currently under production.

7.2 Scope of Audit

The process of identification, selection, procurement and manufacture of the aircraft was reviewed in Audit. The impact of the delays in selection and procurement of the aircraft as well as the economics of production of aircraft and its engine have also been analysed in Audit. The review has been based on information provided to Audit by Air HQ.

Audit had requested the Ministry of Defence on 12th December 1988 to provide comprehensive information on the subject. No information had, however, been provided by the Ministry up to November 1989 on any of the 27 points listed by Audit despite reminders issued in February, March, April and May 1989. This has impeded the efforts of Audit in extent and quality of coverage as well as in depth of analysis.

7.3 Highlights

- **There were significant delays in the identification and selection of a suitable Light Transport Aircraft.**
- **The IAF, was unable to firm up its requirements even after the project was launched and contracts for licence manufacture signed.**
- **The IAF had ordered only four aircraft as against 50 required upto 1988-89. Even these had shown poor serviceability. Due to short availability of the LTA, HS-748 aircraft had been mobilised for communication duties. This utilisation of heavy aircraft for light transport duties had caused an avoidable expenditure of Rs.9.67 crores between 1986 and 1988.**

7.4 Selection of aircraft

The question of manufacture of a light transport aircraft for civil and defence needs had been under consideration of Government since early seventies and a study group was

constituted in 1974 to examine the feasibility of indigenous design, development and production. The Ministry of Tourism and Civil Aviation appointed three different committees between April 1978 and August 1980 to examine the relevant issues and to recommend a suitable aircraft for the third level air service in the country. A committee was again appointed in March 1981 to take a co-ordinated view on the manufacture of a suitable LTA which could cater to the requirement of more than one user. The committee shortlisted the Twin Otter and Dornier aircraft for the LTA and recommended the CASA aircraft as a standby third option. A negotiating committee was constituted in September 1981 to conduct techno-economic negotiations with the manufacturers of these aircraft and with the governments of the countries concerned to select a suitable LTA for licence manufacture in India.

The negotiating committee in its final meeting held in April 1983 considered the relative merits of Dornier and CASA and found the Dornier superior to CASA both on technical considerations as well as in the light of financial and commercial terms offered.

Thereafter, papers were put up to the Cabinet Committee on Political Affairs (CCPA) by the Department of Defence Production in July 1983 for sanctioning the project for the manufacture of 150 Dornier aircraft at an estimated capital expenditure up to Rs. 13.11 crores including foreign exchange (FE) equivalent Rs.6.33 crores and deferred revenue expenditure (DRE) up to Rs.20.12 crores (FE Rs.10.40 crores). The total project cost was estimated at Rs.413.34 crores (FE Rs.235.53 crores) at June 1983 level. The CCPA approved the proposal in August 1983 and directed that there should be close monitoring of the project so as to avoid time and cost overrun.

Considerable delay had occurred in the identification of an aircraft to be inducted

as LTA. Although the need for LTA was suggested by Government in 1978, it was sanctioned only in 1983.

7.5 User requirements and estimated costs

While the Navy and the Coast Guard needed the Dornier aircraft from 1980 onwards, the IAF and Vayudoot needed it from 1984-85 onwards as indicated below :

Year	1980-85	1985-90	1990-95	1995-2000	Total
Req- uired by Navy	7	7	5	5	24
Req- uired by Coast Guard	9	9	9	9	36

Year	84-85	85-86	86-87	87-88	88-89	Total
Req- uired by IAF	5	10	8	18	9	50
Req- uired by Vayudoot	3	3	4	(to be determined)		

HAL was to undertake the licence production of Dornier aircraft. Considering the lead time required by the manufacturers for supply of kits of parts and time necessary to establish production facilities at HAL, the production of the aircraft was expected to commence from 1984-85 onwards.

While taking the approval of Government, it was estimated that the licence production of 150 aircraft when compared to outright purchase was likely to result in a saving of Rs.19.82 crores and a FE saving of Rs.167.16 crores. The unit cost of production of the Dornier aircraft was estimated to be Rs.2.41 crores for the IAF version, Rs.3.04 crores for the Navy version, Rs.2.98 crores for the Coast Guard version and Rs.2.27 crores for the Vayudoot version.

7.6 Purchase and licence agreement

Consequent on the approval of Government, two contracts were concluded with

the aircraft manufacturers in November 1983. The first agreement was for the procurement of eight flyaway Dorniers, three for Coast Guard, one for the Navy and the rest for civil agencies at a total cost of Rs.31.20 crores. These aircraft were scheduled to be delivered between July 1984 and September 1985. The second agreement concluded with the aircraft manufacturers in November 1983 was for the licence manufacture of 140 Dornier aircraft by HAL. These aircraft were to be produced commencing from 1985-86

7.7 Contract performance

The flyaway aircraft contracted in November 1983 were delivered between November 1984 and July 1986. Of these, five aircraft were allotted to civil agencies and three aircraft to the Coast Guard during July 1986 to July 1987. No aircraft was allotted to the Navy as planned earlier.

7.8 Uncertainties in projection of IAF requirements

Four aircraft manufactured by HAL in 1986-87 for the IAF were not accepted by the IAF since HAL did not provide the back up infra-structure like ground support equipment, tools and spares. However, Government sanctioned in August 1987 placement of order on HAL for the procurement of four Dorniers and associated tools and spares at an estimated cost of Rs.20 crores. Subsequently, four aircraft were delivered to the IAF in December 1987. No more aircraft were delivered to the IAF. Though the initial requirement of IAF was for 50 aircraft upto 1988-89, yet IAF did not place any further order.

The IAF was unable to project a firm requirement for the LTA. In September 1981, it projected a requirement of 57 aircraft while the requirement projected to the CCPA in July 1983 was for 50. However, in March 1987, it was reduced to 41 aircraft as it was proposed to replace Dakotas by HS -748 aircraft. Again, in May 1987, the requirement of Dorniers was 45 aircraft for the replace-

ment of Devon aircraft on a one to one basis as against the replacement of 10 Devons planned earlier. Finally, in July 1987, the requirement was again brought down to 43, as only the most essential needs were to be catered for, considering the high cost of the LTA. This proposal was approved by CCPA in January 1988. The fact that Air HQ and the Ministry of Defence were unable to indicate a firm requirement of the LTA over a seven year period shows planning inadequacies which affect both investment and production decisions.

7.9 Impact of non availability of Dornier

The Devon aircraft had been phased out from service in March 1985. Although the Twin Otter aircraft had also outlived its useful life, six aircraft were still in service (January 1989). Due to non-availability of Dorniers and with the phasing out of Dakotas, the HS-748 aircraft (Avro) were utilised for communication duties. Deployment of these heavier aircraft for communication duties resulted in an extra expenditure of Rs.9.67 crores during 1986 to 1988. Further, Air HQ stated in March 1989 that shortfall in availability of the LTA had reduced the logistic air support tactical capability of the IAF. At times, the load earmarked for logistic air support aircraft was combined with the higher capacity of bigger aircraft. Consequently, delays had occurred which adversely affected the operational efficiency of the IAF transport fleet.

7.10 Delay in finalisation of Naval equipment fit

One of the direct supply aircraft meant for the Navy was not delivered for want of finalisation of the standard of preparation (SOP). A Defence Research and Development Organisation committee was formed for studying the various aspects of the Naval SOP. This was not finalised till July 1988. Naval HQ placed an order on HAL in February 1988 for procurement of four Dorniers for the defence of offshore instal-

lations. Two of these were scheduled to be delivered in September 1989 and two by March 1990. As the cost exceeded the sanctioned amount, a revised proposal was put up to the Ministry. Approval to the proposal was pending for want of finalisation of the Naval equipment fit. This would obviously inflate the cost of the aircraft apart from contributing to delay.

7.11 Induction and operation of Dorniers

The Dornier was inducted in IAF in April 1988 with an establishment of six aircraft against which only four aircraft were positioned. This resulted in a shortfall in flying effort. The shortfall during April to November 1988 ranged from 43 to 58 per cent. During the same period the aircraft on ground rate (AOG) was high due to inadequate maintenance support provided by HAL. Consequently, the serviceability of the Dornier fleet was poor and averaged less than 50 per cent.

The matter was reported to the Ministry in June 1989; no reply has been received (November 1989).

8. Acquisition of weapons for an aircraft

8.1 Introduction

Towards the end of 1980, IAF identified aircraft 'X' (aircraft) as being capable of meeting the air superiority multi-role requirements. Government approved in October 1981 the procurement of aircraft 'X' in flyaway condition. A contract was signed in October 1982 with the manufacturers for the supply of a certain number of aircraft. An additional agreement for some more aircraft was entered into in March 1986. An amount of Rs.4.32 crores was paid for securing integration and operational clearance for weapons and warfare equipment configuration of the aircraft.

8.2 Scope of Audit

The identification of weapons, their selection and contract negotiations were

reviewed in audit. The delays in the acquisition of weapons, their impact on the training were also examined.

8.3 Highlights

- There was a mismatch between the induction of the aircraft into squadron service and that of the weapons required for it. While the contract for the aircraft was concluded in October 1982, the contracts for weapons were concluded after a delay of two to three and a half years resulting in an inordinate delay in the availability of the weapons.

Owing to the delay in the availability of the weapons required for training and instructional purposes, the IAF depended largely upon simulation methods and dummy modes.

Due to a single supplier situation prevailing throughout in respect of all weapons and delay in finalisation of contracts price escalation had to be paid to the extent of Rs.57.39 lakhs in foreign exchange.

- An incorrect assessment of the quantitative requirement of weapons 'C' initially and the procurement of an additional quantity subsequently at a higher rate led to an avoidable extra expenditure of Rs.1.12 crores.

- Owing to the absence of a specific clause in the agreement regarding the period for which the aircraft will be kept with the manufacturer, four aircraft remained with the manufacturer for extended periods leading to reduced strength of aircraft in the squadrons.

8.4 Formation of squadrons

All the aircraft contracted in October 1982 were received between June 1985 and November 1986. Aircraft contracted in March 1986 were received between April

1987 and June 1988. The first squadron was raised in June 1985 and the second in January 1986.

8.5 Acquisition of weapons

Keeping in view the multi-role capability of the aircraft, the IAF identified a mix of weapons and put up a proposal for the consideration of the Government in May 1983 for procuring weapons at an estimated cost of Rs.289 crores. It was brought out in the proposal that the aircraft was being cleared for the carriage of seven types of weapons 'A' to 'G' and no additional charges were payable by the Government for the clearance. The clearance and release being expensive, it was proposed to procure weapons from the sources from which they were being obtained by XAF. It was also made clear in the proposal that wherever possible and cost effective, alternative sources would be explored. Government approved the proposal in June 1983 for the procurement of various weapon systems initially at an approximate cost of Rs.261 crores with an option to order the balance weapons worth Rs.28 crores in due course and to constitute a negotiating committee for this purpose.

8.6 Procurement of weapons 'A' and 'B'

Weapons 'A' and 'B' were specific to type and were still under development with foreign firm 'P' when Government's approval for their procurement was obtained in June 1983. It was, therefore, decided to obtain a performance guarantee from the firm. Operational clearance in respect of these weapons was expected to be accorded by the end of 1985.

A contract for the procurement of weapon 'A' and 'B' was concluded with firm 'P' in October 1984, two years after the signing of the agreement for the aircraft.

The contract of October 1984 provided for the procurement of weapon 'A' and weapon 'B' with associated equipment at a

total cost of Rs.264.52 crores. Of this, Rs.148.1 crores represented the basic price of the weapon while the rest was towards escalation and interest on credit. The conclusion of the contract was subsequently got ratified from Government in January 1985. According to the delivery schedule, the complete range of weapon 'A' were to be delivered between July 1987 and February 1989. The delivery, however, commenced from November 1987 and was completed by June 1989. The Ministry stated that Rs.23.07 lakhs were recovered from the manufacturers towards liquidated damages for the delay involved and another claim for Rs.1.62 lakhs was pending settlement. Weapon 'B' were delivered between August 1986 and June 1987.

The squadrons, though raised in June 1985 and January 1986, were without weapons 'A' and 'B' required for instructional, training and operational purposes.

8.7 Procurement of weapon 'C'

Government had approved in June 1983 the procurement of weapon 'C' against a much larger war wastage reserve (WWR) requirement. This weapon was planned to be utilised in other aircraft also and as such the Negotiating Committee recommended in October 1984 the procurement of a higher quantity. An agreement was signed in March 1985, after a delay of over two years from the date of signing the agreement for the aircraft, with foreign firm 'Q' for the supply of weapon 'C' with accessories at a total cost of Rs.25.18 crores with an option to buy an additional quantity subsequently. An additional agreement for the additional numbers was signed in February 1986 at a cost of Rs.5.44 crores. Yet another agreement for the supply of an additional quantity of weapon 'C' was signed in March 1988 at a higher price. As a result of the inaccurate assessment of the requirements initially, an avoidable extra expenditure of Rs.1.12 crores had to be incurred by way of difference in price.

The Ministry stated in September 1989 that a consolidated WWR for this weapon was put up by Air Headquarters, which had not been sanctioned so far (September 1989). It added that the agreement signed in March 1988 was on ad hoc basis pending approval of WWR scale. The consolidated requirement for this weapon was projected for scaling and was stated to be under consideration.

Deliveries against the first agreement were to be made between January 1986 and January 1987, against the additional agreement in June 1987 and against the third agreement between May 1989 and January 1990. However, there were delays due to some technical failure of the weapon requiring rectification. The delays ranged from 97 to 370 days in respect of the first agreement and 76 to 150 days in respect of the additional agreement. Liquidated damages amounting to Rs.65.44 lakhs were, therefore, claimed from firm 'Q' in April 1988. Against this, based on a mutual understanding reached in June 1988 the firm agreed to supply additional weapon 'C' "free of cost" in July 1988. These were also received late and a further claim of Rs.0.35 lakh towards liquidated damages preferred, still remains to be settled.

8.8 Procurement of weapon 'F'

Approval of the Government also existed for the procurement of weapon 'F'. The weapon under manufacture with foreign firm 'P', was to be cleared by September 1985. The firm quoted Rs.9.94 lakhs for each item in October 1983. The negotiating committee which considered the offer in December 1984 found it to be exorbitantly high. At one stage, the committee even suspended negotiations with firm 'P' in view of their high cost. In one of its subsequent meetings held in June 1985, the committee considered that since no other source was available and firm 'P's' was the only weapon cleared for integration on the aircraft, there was no choice but to negotiate with firm 'P'. After further negotiations, a final price

of Rs.7.58 crores (at October 1983 level) plus escalation was settled and a contract signed in April 1986. The Ministry stated in September 1989 that quotations from two more firms (besides firm 'P') were invited as they were the known likely sources but they did not respond. It added that they had no choice but to procure the weapon from firm 'P' and they could not also help the single supplier situation since the IAF's requirements were to be met on operational grounds. It further stated that it secured a reduction of 4.7 per cent from the earlier negotiated price.

Thus, in view of the single supplier situation that prevailed, there were no means to either assess the reasonableness of costs or reduce them through negotiations to levels which could be considered significantly competitive.

8.9 Procurement of weapon 'H'

Approval of the Government was obtained in May 1983 for the procurement of weapon 'G' at a cost of Rs.9.29 crores. Subsequently, in October 1984 Air HQ projected a requirement of weapon 'H' in place of 'G'. The quantitative requirement was worked out based on the financial sanction already available for weapon 'G' and not with reference to the actual operational requirements. A contract with the firm was finally concluded in April 1986 at a negotiated price of Rs.14.95 crores. The delay in conclusion of the contract resulted in escalation and, according to the Ministry, the escalation paid in foreign currency amounted to Rs.57.39 lakhs. The Ministry further stated that the quantity procured was on adhoc basis to cover the amount already sanctioned for weapon 'G' and would not be sufficient to meet the operational requirements of the IAF. The weapons on order were delivered between November 1987 and May 1988. The Ministry stated that Rs.1.56 lakhs were recovered towards liquidated damages.

8.10 Weapon integration and clearance

The agreement for the aircraft specified clearance of weapon configuration by agreed dates. For carrying out the integration and clearance, aircraft were to be given

to the manufacturers if necessary. The contract, however, did not specify the duration of the period. Four aircraft were given to the manufacturers for this purpose between December 1984 and December 1988. While two aircraft remained with the manufacturers for periods ranging from 4 to 22 months, the third aircraft given in April 1987 and fourth given in December 1988 were still with the manufacturers (October 1989). The Ministry admitted that the 'loan' period for weapon integration and operational clearance was not specified in the contract as it was mutually agreed that it would be specified later on. It added that the aircraft were handed over to the seller after their acceptance at the manufacturers premises and two aircraft given in December 1988 for 18 months still remain with the manufacturers. Due to non-inclusion of a specific clause regarding the duration of the 'loan' period in the agreements, four aircraft remained with the manufacturers for extended periods leading to deficiency of aircraft to this extent in the squadrons.

There were also delays, ranging from 15 to 33 months, in the configuration clearance of the weapons by the manufacturers and the operational clearance for the entire range of weapons was obtained by March 1988 only. The Ministry stated in June 1989 that liquidated damages to the extent of Rs.27 lakhs would have to be recovered as per provision of the agreement. However, no recovery has been effected so far.

8.11 Impact of delay in acquisition of weapons

Although, the first squadron of the aircraft was formed in June 1985 and the second in January 1986, the required weapons were not available for training as well as operational purposes till the end of 1987. For training and instructional purposes, the IAF was stated to be depending largely upon simulation methods and dummy modes. The Ministry maintained in September 1989 that it was not possible for them to conclude

weapon contracts so as to synchronise their deliveries with that of the aircraft since almost all the designated weapon systems were still at the development stage and not ready for production.

9. Base Repair Depots

9.1 Introduction

Maintenance support to the Air Force is mainly provided by base repair depots (BRDs) who undertake the repair and overhaul work of various types of aircraft, aeroengines and other associated major equipment in use with the Air Force. The annual repair and overhaul tasks of various BRDs are issued one year ahead by Air Headquarters centrally. The tasks are prepared based on authorised and anticipated flying efforts of the Air Force. They cover all aircraft, aeroengines, rotables and other equipment which are capable of being repaired and overhauled economically. The economical repairs are such as can be carried out at a cost estimated not to exceed 50 per cent of the price of the new article. In exceptional cases, repairs can be undertaken with the prior approval of Air Headquarters even if the cost of repairs exceeds 50 per cent of the price of new article. A quantum of premature withdrawals, category 'B' and category 'E' arisings also go into the working out of repair tasks. The tasks form the basis for provisioning of spares required for the repair works and realistic planning of manpower and other associated establishment. In fact, the tasks represent advance projection of realistic repair and overhaul works to be undertaken by the BRDs.

9.2 Scope of Audit

The working of BRDs from 1976-77 to 1980-81 was examined in Audit earlier and reported in para 43 of the Report of the Comptroller and Auditor General of India for 1981-82, Union Government (Defence Services).

The working of six BRDs involved directly in the repair/overhaul of Aircraft and

aeroengines during the period 1983-84 to 1987-88 was reviewed in Audit with special reference to completion of tasks, utilisation of manpower, exploitation of installed capacity, provisioning of material, production planning and control. Utilisation of available inventory was also examined. The adequacy of task formulation and management of production planning with due regard to financial economy was also reviewed.

9.3 Organisational set up

The BRDs function under the functional and administrative control of Headquarters Maintenance Command. Overall control rests with Air Headquarters. Installed capacity for various items of work in the BRD is fixed by Air Headquarters based on different factors.

9.4 Highlights

- **The repair work in the base repair depots is carried out without cost considerations. At No.1 BRD, the extra expenditure on account of uneconomical repair worked out to Rs.42.51 lakhs in respect of diesel generating sets and airconditioners.**
- **The position of repair work relating to rotables at No. 1, 4 and 11 BRDs have not been satisfactory.**
- **There have been delays in the setting up of repair facilities at No. 4 and 11 BRDs resulting in an expenditure of Rs.48.25 crores on repair jobs abroad. Also the installed capacity at No. 1, 3, 4 and 7 BRDs remained underutilised.**
- **Formulation of tasks by Air HQrs lacked accuracy and realism and restricted the utilisation of available resources in the BRDs.**
- **There were considerable premature failures of repaired items warranting their repair again which involves avoidable expenditure. There was no monitoring system to analyse the failure pattern of the**

products by which the situation can be improved upon.

No effective monitoring and control over the utilisation of manpower in the BRDs was being exercised. Consequently, there were considerable unproductive hours costing Rs.30.37 crores in respect of six BRDs during 1983-88. 13.71 lakh hours costing Rs.2.40 crores were consumed in excess of the standard labour element fixed for various jobs by Air HQ at Nos.1, 3, 4 and 5 BRDs.

The provisioning of materials to meet the production requirements of various BRDs has not been effective. Various inventory control measures were not being implemented effectively. Resultantly, inactive inventory costing about Rs.180 crores had accumulated over the years which involves an avoidable expenditure of approximately Rs.18 crores per annum as its carrying cost.

9.5 Capacity utilisation

The tasks assigned to No.1, 3, 4, 5, 7, and 11 BRDs between 1983-84 and 1987-88 were mostly completed except category 'B' repairs of aircraft 'A' and rotables at No.1 BRD and aeroengines 'G' and rotables at No.4 BRD. In these cases, the shortfalls were 15 to 39 per cent, 3.52 to 26.90 per cent, 55.33 per cent and 100 per cent respectively against the allotted tasks. At No.11 BRD 628 items of category 'D' rotables involving 3977 quantities valued at Rs.90.48 lakhs were awaiting repairs as on 31st March 1989. These rotables had accumulated over the years due to non-availability of repair facilities. There have been inordinate delays in the setting up of repair facilities for aeroengines 'G' at No.4 BRD and for aircraft 'X' at No.11 BRD. For aeroengines 'G', the detailed project report was received in August 1984. As per latest pro-

jections, the facilities are likely to be established fully by October 1989. In the meantime, 106 engines and 295 aggregates had to be got repaired from abroad during 1984 to 1988 at a cost of Rs.38.35 crores. In addition, 25 more engines are also expected to be repaired and overhauled abroad during 1989-90 at an estimated cost of Rs.9.90 crores. For aircraft 'X' the repair facilities are expected to come up by June 1989.

The annual installed capacity at No.1, 3, 4 and 7 BRDs remained underutilised to the extent given below :-

BRD	Repair line	Extent of percentage underutilisation
1	'A' aircraft	87.47
	'B' aircraft	18.33
3	'C' aeroengine	54.00
	'D' aeroengine	13.00
	'E' reductor	27.00
	'F' aeroengine	12.62
7	'J' Missiles	86.75
	'H' Missile	72.50
	'I' Missile	75.00
	Radar 'A'	64.44

Reduction in task was the main factor responsible for underutilisation of installed capacity.

9.6 Procedural deficiency

There had been wide variations between the authorised and planned rates of utilisation in respect of various aircraft during 1983-84 to 1987-88. The variations worked out between 46.6 and 96.6 per cent. Actual rates of utilisation achieved were, however, even less than those planned. Such a situation led to a mid term revision of repair tasks by Air HQ between 1984-85 and 1987-88. In most of the cases, the trend of revision was downward. Obviously, this calls for immediate attention with a view to achieving a significant improvement.

There is no mechanism available at present in the BRDs to ensure that the repairs being carried out by them are cost-effective. No document is maintained by the BRDs to show the total cost of repair of any item of equipment. At No.5 BRD there were instances where cost of labour alone had exceeded the cost of ro-

tables which were being repaired. At No.1 BRD the repair of diesel generating sets and airconditioners was being done from 1982. On an average, extra and avoidable expenditure of Rs.17 lakhs was being incurred annually by the BRD in comparison to the cost of these repairs through trade. In all the cases, the cost of repair was more than 50 per cent of the cost of new equipment. According to HQ Maintenance Command, the cost of repair was between 80 and 110 per cent of the cost of new equipment. During 1983-84 to 1987-88 alone an extra and avoidable expenditure of Rs.42.51 lakhs had been incurred in the process of repair of diesel generating sets and airconditioners by No.1 BRD. The position was reported to Air HQs in January 1988. However, no decision to discontinue the repair of diesel generating sets and airconditioners in the BRD has been taken so far (April 1989).

The present situation in the BRDs would require a review to make the repair work done in the BRDs cost-effective.

9.7 Manpower utilisation

Unproductive manhours in respect of undermentioned BRDs during 1983-84 to 1987-88 were as follows :-

BRD No	Percentage of unproductive manhours to the total manhours available	Cost of unproductive manhours (Rs. in crores)	Remarks
1	35.02 to 37.78	6.27	For 1983-84 to 1987-88 (September 83 onwards)
3	29.99 to 34.61	6.64	For 1984-85 to 1987-88 only
4	28.23 to 36.58	7.30	For 1983-84 to 87-88 (except Oct. 1987) (Sept. 1983 onwards)
5	33.70 to 40.69	2.59	For 1983-84 to 1987-88 (Sept. 1983 onwards)
7	32.63 to 38.62	4.33	For 1983-84 to 1987-88 (Sept. 1983 onwards)
11	34.23 to 41.18	3.24	For 1984-85 to 1987-88 only

In all, there were 1.79 crores non-productive manhours having a financial effect of Rs.30.37 crores for the period 1983-84 to 1987-88. Apparently, no uniform norms for utilisation of manpower by various BRDs are being observed and there is no effective control over the utilisation of manpower in the BRDs.

9.8 Excess consumption of manhours

It was noticed that at Nos.1, 3, 4 and 5 BRDs excess manhours consumed were to the extent of 13.71 lakhs when compared to the standard hours fixed for various repair works undertaken during 1983-84 to 1987-88. The cost of excess hours worked out to Rs.2.40 crores.

In some cases, the excess manhours utilised were regularised subsequently by the Ministry of Defence (Ministry). The standard hours fixed by Air HQ have evidently not been realistic in terms of the requirement of jobs. The position would warrant a review in order to optimise the manpower resources in the BRDs.

9.9 Quality of production

The quality and reliability of production from the BRDs can be determined with reference to post-repair performance of the equipment either repaired/or overhauled. There is no system in the BRDs to monitor and analyse the failure pattern of their products. In fact, the concept of calculating mean-time between overhaul as a measure of quality of output did not exist in the BRDs. While reviewing the quality aspect, it was noticed that power plants of the Dvina system ESD-75 were received back at the BRD after repair and overhaul as a result of premature failure. The laid down time between overhaul for the plant was seven years for the first overhaul and four years for subsequent overhauls. However, the plants received back had to be withdrawn before the due time for repair/overhaul to the extent given below:-

Period	Number of plants withdrawn
Within 1 year	11
Within 1-2 years	11
Within 2-3 years	9
Within 3-4 years	3
Total	34

These premature failures were attributable partly to improper operation and maintenance by the users and partly to substandard materials procured from trade. The approximate cost of labour alone consumed during the process of repair and overhaul of these plants worked out to Rs.11.68 lakhs. Premature failures of equipment after their normal scheduled repair and overhaul by the BRDs deserve a detailed study to minimise such failures in future with a view to avoiding heavy expenditure being incurred on their repair and overhaul again.

9.10 Material management

The main objective of material management is economy and supply effectiveness. Provisioning constitutes one of the important functions of material management. Its object is to have the right kind of equipment available in the right quantity, in the right place and at the right time. The position of provisioning of stores at BRDs 1, 3, 4, 5 and 7 between 1983-84 and 1986-87 was as follows:-

	1 BRD & 4 BRD	3 BRD	5 BRD	7 BRD
Items reviewed as per provisioning reviews	117186	44555	28124	37384
Items projected as per requirement	31409	8547	5962	2997
Items indented	7617	8373	5644	2840
Items contracted	6966	6661	5644	1910
Items received within contractual delivery schedule	5266	3011	Not applicable	524

Items indented worked out to 50.03 per cent of total items projected as requirement. Similarly, contracted items worked out to 86.54 per cent of the indented stores. Delivery to the extent of 41.55 per cent of items was received during the scheduled delivery period. Apparently, the provisioning process has not been in conformity with the orders on the subject. Such a situation is bound to result in production hold ups in the BRDs. The existing provisioning procedure thus needs review to make it more effective.

9.11 Inventory control

The purpose of inventory control is to determine systematically what items to hold in stock, when and in what quantities to order them and how much to hold at any time. It emphasises the need for careful computation of requirements, timely initiation of procurement action, scientific determina-

tion of economic order quantities and optimum safety stock level. The utilisation of

inventory available in some BRDs between 1984-85 and 1986-87 was as follows:-

	1 BRD &	3 BRD	5 BRD	7 BRD	11 BRD	Total
Numbers of items held in the inventory of spares	61452	64237	19662	56708	28870	230929
Value of the inventory (Rs. in lakhs)	7564	7357	1780	9167	2988	28856
Active inventory	16265	6731	4189	50267	Not available	77452
Value of active inventory (Rs. in lakhs)	1852	616	415	1023	Not available	3906
Non-moving (inactive-inventory)	36945	11666	3712	8760	1175	62258
Value of inactive inventory (Rs. in lakhs)	1417	138	281	447	Not available	2283

The element of active and inactive inventory worked out to 33.53 and 26.95 per cent respectively. Their cost was Rs.39.06 crores and Rs.22.83 crores respectively. According to Air HQ, the approximate cost of inactive inventory in respect of all the BRDs would be about Rs.180 crores. Its size was stated to be above 60 per cent of the total inventory. Apparently, the various inventory control measures were not being observed adequately. The existing procedures would, therefore, require a detailed study to cut down the holding of inactive inventory in the BRDs. At the same time, it would save considerable carrying cost which normally worked out to 10-15 per cent of the cost of stores. In the present case, the saving would be about Rs.18 crores per annum.

The matter was referred to the Ministry in July 1989; no reply has been received (November 1989).

10. Procurement, manufacture, operation and maintenance of an aircraft

10.1 Introduction

A licence agreement for the manufacture of aircraft 'A' was signed in March 1981. The licence agreement, however, was

not implemented as, in the meantime, the manufacturer offered an improved version (aircraft 'B') and also agreed to substitute its licence agreement in place of the agreement for aircraft 'A' signed in March 1981. Government's approval was obtained in March 1982 for the licence agreement concluded for the manufacture of 165 aircraft 'B' and its engines and also to negotiate and conclude the licence agreement for setting up of indigenous repair facilities for both aircraft 'A' and 'B', their engines and associated equipment. Government sanctioned in October 1982 the placement of an initial order on HAL for the manufacture and supply of 165 aircraft 'B' for the Air Force (IAF) commencing from 1984-85 onwards. The aircraft is currently under production.

10.2 Scope of Audit

An analysis of the economics of production of aircraft 'B' as also the establishment of indigenous repair facilities for the aircraft, their engines and provision of maintenance support have been examined.

10.3 Highlights

- The review reveals poor planning, project management and implementation.
- Though Government sanctioned placement of orders on HAL for

the manufacture of aircraft 'B' in October 1982, the order on HAL was placed only in September 1984. This resulted in a delay of over one year in achieving the established rate of production by HAL.

The cost of the project had increased by Rs.237.48 crores and the anticipated savings of Rs.233.86 crores negated.

Poor aircraft serviceability affected the utilisation rate and consequential flying efforts. There was considerable shortfall in the flying efforts achieved.

There was a mismatch in the induction of the aircraft and procurement of weapons and training aids. Though aircraft was inducted in December 1985, the weapons started arriving from the end of 1985 onwards and continued till January 1989. The squadron was without trained personnel to use the specialist weapons till December 1986.

No facilities for repair of aeroengines fitted on aircraft 'B' have been set up so far owing to the possibility of HAL taking up the task. Ambiguity on this point had led to delay in initiating action for setting up of overhaul facilities and even the protocol had not been signed with the manufacturers till March 1989, though expected overhaul arisings of engines commenced from July 1988. Consequently, indents worth Rs.8.96 crores for overhaul of engines and Rs.22.78 lakhs for overhaul of aggregates have been placed with the manufacturers.

10.4 Licence manufacture

The licence agreement for transfer of technology and manufacture of 165 aircraft 'B', its engine and related equipment

provided for an option for manufacture of 100 additional aircraft. The licence fee payable for transfer of technology for the manufacture of aircraft 'B' was Rs.42.76 crores. In the preliminary project report (PPR) submitted to Government in October 1983, a saving of Rs.233.86 crores in FE was anticipated in the licence manufacture programme of aircraft 'B' as the imported cost of aircraft 'B', reserve engines and accessories planned for production at HAL would have been Rs.1,253.22 crores in FE as against the FE content in the project cost of Rs.1,019.36 crores. The detailed project report (DPR), however, issued in October 1986 after a delay of one year indicated the FE costs of licence manufacture at Rs.1,248.34 crores. The FE savings projected in the PPR were, therefore, unrealistic and proved illusory.

10.5 Cost over run

While the total cost of the project initially estimated was Rs.1258 crores, the total cost of the project as per PPR submitted in October 1983 was estimated to be Rs.1982.61 crores (FE Rs.1174.61 crores). As per the DPR issued in October 1986 the total cost of the project had further increased to Rs.2220.09 crores (FE Rs.1472 crores). A comparison of the PPR and DPR revealed that the project cost had been increased by Rs.237.48 crores within a span of three years. The average cost of the aircraft as per the DPR was estimated to be Rs.10.63 crores as against Rs.6.79 crores estimated earlier. On the basis of DPR, Government sanctioned and authorised HAL in December 1986 to incur expenditure upto Rs.118.13 crores on capital expenditure and Rs.268.84 crores on deferred revenue expenditure.

10.6 Project implementation

Though Government sanctioned the placement of an order on HAL for the manufacture of 165 aircraft 'B' and associated equipment in October 1982, the matter re-

mained under discussion between HAL, IAF and the Ministry of Defence (Ministry) for over a period of two years and the order on HAL was finally placed in September 1984.

10.7 Production and delivery

The production plan of aircraft 'B' was drawn up so as to achieve a stabilised annual rate of production of 20 aircraft, 26 engines and corresponding number of avionics and accessories. According to the order placed on HAL in September 1984, 165 aircraft along with engines were required to be delivered between 1984-85 and 1992-93. The order placed on HAL, however, was revised in October 1985 which extended the delivery schedule up to 1994-95. Although delivery of the aircraft to the IAF was on schedule, the stabilised rate of production of 20 aircraft per year had not been achieved till 1988-89. Earlier, HAL had indicated that they would need a period of five years to set up infrastructure for production of aircraft 'B'. Had the order on HAL been placed in time, the stabilised rate of production could have been achieved from 1987-88 onwards. HAL, however, delivered only 11 aircraft to the IAF during 1988-89.

Production of the engines was also delayed. HAL was to produce 51 engines during 1988-90. It, however, informed the Ministry in December 1988 that the delivery of engines from raw material would commence only in 1990-91 and that it would be able to deliver only 28 engines thereby leaving a shortfall of 23 engines. In order to meet the deficiency in production, HAL had proposed to import 23 engines for meeting the IAF requirements. The decision to import the engines was yet to be taken.

10.8 Delay in acquisition of weapons

Approval of Government for procurement of weapons and training aids costing Rs.114.85 crores for the first two squadrons was obtained only in February 1985 and a contract with the foreign manufacturers for supply of various weapons and training aids

was signed in June 1985. The weapons and training aids were actually received between December 1985 and January 1989, though the first squadron of aircraft 'B' produced by HAL was formed in December 1985.

IAF personnel were required to be trained on the specialist weapons and associated equipment prior to the aircraft's induction. Though aircraft 'B' was inducted in squadron service in December 1985, necessary training to IAF personnel for weapons was imparted only in September 1986 and the IAF personnel trained by the manufacturers became available only from the beginning of 1987. Consequently, the first squadron though formed in December 1985 was without trained personnel to use the specialist weapons till the end of December 1986.

10.9 Shortfall in flying efforts

There was a significant shortfall in the performance of the aircraft 'B' produced by HAL. The percentage of shortfall in flying efforts as compared to authorised task was 95.42 per cent in 1985, 76.60 per cent in 1986, 83 per cent in 1987 and 73.60 per cent in 1988. The utilisation rate achieved by the aircraft was also short of the authorised utilisation rate and percentage of shortfall ranged between 53.78 to 91.89 per cent during the years 1985 to 1988.

The percentage of serviceability achieved by aircraft 'B' and the position of Aircraft on Ground during the period 1986 to 1988 was as under:

Year	1986	1987	1988
Serviceability (per cent)	57	48	64
Aircraft on Ground (per cent)	15	5	11.5

The low serviceability of the fleet has adversely affected its utilisation rate. Air HQ stated that the high AOG percentage was due to premature withdrawal of avionics components from the aircraft. It added that the float catered for maintenance and 100 hours norms of operation were consumed

at a faster rate than anticipated. Air HQ further stated that HAL has not yet established the repair facility of the aircraft and there was accumulation of repairable rotables and avionics items. Further, as the aircraft was new, the identification of snags and their rectification was taking time for want of skill and experience at unit level. Air HQ had also stated that the expected serviceability percentage of the fleet was likely to be between 55 and 60 per cent.

10.10 Establishment of repair facilities

Though Government had approved in March 1982 a proposal for negotiating and concluding the licence agreement for setting up of indigenous repair facilities for aircraft 'B', its engine and associated equipment, no such facilities have been set up. Initially, the IAF was interested in entrusting the overhaul task of this aircraft including its engine to HAL and moved a proposal in 1987 for transferring the responsibility to HAL. While the Government agreed to transfer the responsibility for overhaul of the airframe to HAL in April 1987, no firm decision in respect of engine overhaul was taken. It was later decided in August 1988 that the facilities for repair and overhaul of engines of aircraft 'B' be set up at the same Base Repair Depot (BRD) where the facilities were being set up for engines of aircraft 'A'. However, no sanction for setting up of such facilities had been issued till March 1989.

The repair facilities being set up at a BRD for engines which are more or less similar to those fitted in aircraft 'B' would require to be augmented. Air HQ stated in August 1988 that a memorandum for augmentation of the repair facilities at the BRD was being finalised. However, no agreement had been concluded with the manufacturers till March 1989. Air HQ further stated that a limited Detailed Project Report for augmentation of the facilities and a time schedule would be drawn up after the protocol was signed. According to Air HQ, a minimum of two years would be required

for setting up of overhaul facilities after signing the contract.

Thus, the augmentation of the existing overhaul facilities to undertake overhaul of engines of aircraft 'B' is not likely to take place in the near future as even the agreement had not been signed till March 1989. Even after the facilities are established, supply of spares would be an added problem. According to the Air HQ, the supply of spares would be a major hurdle in case the manufacturers insisted on supply of spares by HAL out of the licenced production as HAL had intimated that due to limited capacity they would not be able to meet the requirements of the IAF. On the other hand, the expected overhaul arisings of engines would commence from July 1988 and a total 21 engines would be due for overhaul by September 1990. Based on these expected arisings, two indents were placed on the manufacturers in December 1988 for overhaul of 21 engines and 44 items of aggregates during 1990-91 at a cost of Rs.8.96 crores for overhaul of engines and Rs.22.78 lakhs for repair of aggregates. This could have been avoided had timely action been taken to set up the indigenous repair facilities.

The matter was reported to the Ministry in July 1989; no reply has been received (November 1989).

TRAINING

11. Commissioning of a training simulator

A contract concluded with a foreign supplier in August 1982 for the procurement of helicopters included, inter-alia, the supply of a simulator at a cost of Rs.11.81 lakhs. The simulator was required to provide training to pilots in missile firing in the manual mode. It was received in December 1983 and was warranted for one year from the date of its delivery. After over two years of its receipt, the simulator was issued to the user unit in February 1986. It was not, however, put to use as the necessary operating

instructions and technical publications had not been received. In May 1987, after 42 months of its receipt, the foreign supplier was requested to send the necessary publications and operating instructions. These were not received even after repeated requests. Because of the simulator not being functional, pilots have had to undertake live firing of missiles without the benefit of ground based simulated firing.

The Ministry of Defence stated in August 1989 that the simulator had been commissioned in March 1989. It added that non-availability of the simulator had no adverse effect since the need to fire missiles in the manual mode had not arisen since 1983. The fact, however, remains that the simulator was acquired to train pilots for a contingency where the manual mode of operation would be necessary and training for it was not available.

The case revealed serious laxity in commissioning an imported, operational training aid costing Rs.11.81 lakhs. This, together with the inordinate 42 months delay in taking up the matter with the foreign supplier requires investigation and the enforcement of accountability.

12. Delay in procurement of an equipment for pilot selection

The Committee on Flight Safety had recommended in 1982 the introduction of a Defence Mechanism Test (DMT) machine in pilot selection for screening candidates who were prone to accidents due to error when under stress and also those who were unlikely to make the grade in flying.

Air Headquarters (HQ) proposed the procurement of three DMT machines including hardware and spares from a foreign manufacturer in October 1983 at an approximate cost of Rs.7.05 lakhs inclusive of the cost of training. It was mentioned in the proposal that the DMT machine, which would help in reducing the number of accidents besides lowering the wastage rate in training, was to be tried out on an experimental basis before

being finally introduced for pilot selection in the Indian Air Force.

In April 1984, the manufacturer revised the cost of three DMT sets which included the cost of hardware and improved revised training courses to Rs.13.5 lakhs. The offer, which was initially valid upto May 1984, was extended upto August 1984. The manufacturer transferred in February 1986 the selling rights of the DMT machine to another foreign firm which revised its price to Rs.16.49 lakhs per set. Government approved in December 1987 the procurement of one DMT machine at a cost of Rs.16.49 lakhs, amended to Rs.18 lakhs in July 1988, for which a contract was concluded immediately thereafter.

The DMT machine was brought to India by the manufacturer in September 1988 and it is being used in the collection of data on pilots. Two DMT training courses as prescribed in the contract were conducted in September 1988 and April 1989. It would be finally evaluated after the completion of two more training courses scheduled for November 1989 and May 1990.

The Ministry stated in September 1989 that soon after the offer of the firm was received in 1984, Air HQ considered the proposal and referred it to the Ministry. Thereafter, the proposal was considered from many angles including its acceptability by Director General, Armed Forces Medical Services and Union Public Service Commission for selection of pilots in case the usefulness of the test was proved and also in the context of its acceptability and evaluation in other countries. The Ministry further stated that after the completion of all the training courses, evaluation results of DMT machine would be known by August 1991 on collection of necessary data and its interpretation. The fact, however, remains that the procurement of the system projected by Air HQ as far back as October 1983 with a view to bringing down aircraft accidents and reducing wastage in training was effected only in July 1988 by incurring an

extra expenditure. Further, the evaluation results of the DMT machine would be available only by August 1991.

13. Delay in completion of a training project

A pilotless target aircraft (PTA) squadron was established in July 1978 with the objective of providing training in air-to-air and ground-to-air firing practice besides evaluation of weapon systems and missile testing. A contract for the import of PTA at a cost of Rs.4.32 crores was concluded in May 1977. The Air Force received the equipment between May and September 1979.

The acquisition of land and provision of works services for the squadron were not, however, matched with the delivery of the equipment. A Board of Officers recommended, in January 1980, the acquisition of 1,489.28 acres of a State Government land and 61.20 acres of private land for the training project. The State Government confirmed in October 1980 that 1489.28 acres of land required for the Air Force would be made available free of cost. In December 1981 Government sanctioned acquisition of 61.20 acres of private land at a cost of Rs.1.79 lakhs invoking the urgency clause under the Land Acquisition Act, as also the transfer of 1489.28 acres of State Government land free of cost, subject to payment of Rs.0.33 lakh as compensation for afforestation.

In October 1985, the State Government expressed its inability to hand over the land and Air Headquarters (HQ) decided in December 1986 to acquire only 61.20 acres of private land. Meanwhile, the sanction of December 1981 was amended in August 1984 to accommodate the increase in the cost of the private land from Rs.1.79 lakhs to Rs.10.40 lakhs which was deposited with the State Government in March 1985. Further, because of an amendment to the Land Acquisition Act, the cost of the private land was revised to Rs.16.52 lakhs. The acquisition

of the land had not been done till August 1989 due to which the civil works sanctioned in February 1982 at a cost of Rs.30.32 lakhs and released for execution in March 1982 could also not be progressed.

The Ministry stated in October 1989 that PTA training operations were proposed to be carried out on land belonging to another defence establishment and, as such, acquiring of land was not envisaged when contract for the equipment was concluded in 1977. However, when the use of the land was objected to by the defence establishment in July 1979 on the ground that the site fell within the danger zone of their firing activities, acquisition of private land and transfer of state Government land were sanctioned in December 1981. Thus, due to a mismatch in the procurement of equipment and the acquisition of land, the PTA squadron established in 1978 had not become fully functional even after a decade. Consequently, in spite of the procurement of the equipment worth Rs. 4.32 crores in May 1977, the Air Force could achieve 50 and 25 per cent of its authorised commitments during 1979 and 1980 respectively and an average of 19.72 per cent during 1981 to March 1989. The acquisition of the land which was sanctioned in 1981 and for which payment of Rs.10.40 lakhs was made in March 1985 had not been acquired till August 1989.

WORKS SERVICES

14. Construction of accommodation at Bombay

The Ministry of Defence (Ministry) accorded sanction in October 1984 for the formation of an Oil and Natural Gas Commission (ONGC) support team at Bombay for providing minimum infrastructural facilities before helicopters were received for the increasing off-shore oil exploration tasks. A sanction substituting the team by a full-fledged ONGC Support Establishment was issued by the Ministry in January 1985. Capital expenditure on the procurement of

helicopters and associated equipment costing Rs.131.28 crores was to be met by ONGC. Other expenditure, including the cost of infrastructure and recurring administrative, operational and maintenance expenses, was initially to be borne by the Air Force (IAF) and was to be reimbursed by ONGC subsequently. The helicopters to be procured were expected to be delivered beginning from December 1984.

In March 1985, it was decided to create only the common ground support facilities as the support task of the IAF was uncertain in view of a proposal to form a Helicopter Corporation. As regards domestic accommodation for IAF personnel of the Support Establishment, it was decided that ONGC would purchase 75 flats and make a provision of Rs.56 lakhs for the modification of existing buildings at the Air Force station, Bombay for accommodating 230 airmen.

Between March and April 1985 three works services costing Rs.430.21 lakhs in all were sanctioned on grounds of operational necessity by Air Headquarters (HQ) for the Support Establishment. It included works costing Rs.54.20 lakhs for creating domestic accommodation by additions and alterations to certain buildings at Bombay. Subsequently, on 3rd September 1985, ONGC conveyed their decision to Military Engineer Services (MES) Bombay not to incur any further expenditure for the development of infrastructural facilities as the purchase of helicopters was linked with the formation of a Helicopter Corporation of India (HCI). Instead of stopping the work at that stage, the MES accepted three further tenders on 9th and 10th September 1985 and 24th December 1985 for the provision of ground support facilities (technical accommodation) and additions, alterations to existing buildings (domestic accommodation). The Ministry stated in October 1989 that this project was of national importance and very urgent, tagged with time bound schedule and therefore, execution thereof was expeditiously carried out. It was, however,

seen that although 'contractual implications' was cited as reasons for not stopping the work, no detailed analysis of pros and cons and financial aspects of cancelling the contract was carried out. In fact the buildings were handed over to the contractor for carrying out the additions/alterations in November-December 1985 and some of the buildings were handed over as late as in April 1988 against September 1985 as per the contract. The works relating to technical operational and administrative accommodation were completed between June and October 1987 and handed over to HCI in May 1988. The HCI agreed to reimburse Rs.350 lakhs towards the cost of technical, operational and administrative accommodation. The Ministry stated in October 1989 that reimbursement of expenditure of Rs.315.25 lakhs incurred so far has not been made by HCI or ONGC.

As regards the work on additions, alterations to the existing buildings, for creating domestic accommodation the tender for which was accepted in September 1985, phases I and II of the work were expected to be completed by February and September 1986 respectively. Due to a default of the contractor, the contract was terminated in August 1987 and a fresh contract was concluded in March 1988 for completion of the left over work at the risk and cost of the defaulting contractor. The work was completed in December 1988. In September 1987 a regular sanction for this work in supersession of the go-ahead sanction of April 1985 was accorded by HQ South Western Air Command at a cost of Rs.63.11 lakhs.

While these works were being progressed, the ONGC Support Establishment was not set up and the support team itself was disestablished with effect from July 1986.

As it became clear that the proposal to set up an ONGC Support Establishment had been shelved, it was decided by Air HQ in October 1986 to utilise the accommodation created, with additions and alterations for augmenting the domestic accommoda-

tion at the Air Force Station, Bombay. In addition, in June 1988, the Ministry accorded sanction for the construction of permanent married accommodation at Bombay at an estimated cost of Rs.276.71 lakhs. Air HQ stated in October 1988 that the accommodation constructed with additions and alterations at a cost of Rs.63.11 lakhs is of a purely temporary and inferior nature with a life of five years. It also stated that the main project sanctioned at a cost of Rs.276.71 lakhs is to meet the requirement on a permanent basis. Clearly, therefore, the additions and alterations could have been avoided which had resulted in an avoidable expenditure of Rs.63.11 lakhs.

PROVISIONING

15. Procurement of cables for airfield lighting

Based on an indent placed in November 1982 for the procurement of different types of cables with rubber moulded fittings required for airfield lighting, Air Headquarters (HQ) received quotations from seven firms. The Director of Technical Development and Production to whom the quotations were forwarded for technical vetting indicated in September 1983 that the offers of only two firms, 'A' and 'B' were technically acceptable. Their rates were Rs.38.24 lakhs and Rs.32.58 lakhs respectively.

However, the Tender Purchase Committee (TPC) decided in November 1983 to place an order for the entire quantity on firm 'C' whose rates were substantially lower and whose samples of cable without moulded fittings was found satisfactory subject to certain further improvements. Accordingly, Air HQ placed a supply order in December 1983 on this firm at a total cost of Rs.23.57 lakhs.

The firm, however, could not develop an advance sample of the desired length for approval within the stipulated period and requested Air HQ in May 1984, for extension of time by another three months to achieve the manufacturing of the cable of

desired lengths. Alternatively, it sought cancellation of the supply order without any financial repercussions.

Based on the terms of the supply order, the TPC decided in June 1984 to cancel the supply order on this firm without any financial repercussions and to float a limited tender enquiry, as the requirement of cables had since been upgraded as operational. On retendering, quotations were received from firms 'A' and 'B' only. Although the rates of firm 'A' were lower, supply orders were placed on both the firms due to the limited manufacturing capacity of this firm. A supply order was placed on firm 'A' in December 1984 (as amended in March 1985) at a total cost of Rs.14.53 lakhs and that for the remaining quantity on firm 'B' in September 1985 (as amended in June 1986) at a cost of Rs.27.44 lakhs. Supplies by these firms were completed between August 1985 and April 1986 and March 1986 and September 1988 respectively.

Had the supply order been placed on firm 'B' initially on the basis of technical advice given in September 1983, an extra expenditure of Rs.9.40 lakhs and delay in procurement would have been avoided.

Air HQrs stated (February 1989) in reply to an audit query that in the absence of the cables, lighting equipment at airfields was not subjected to higher loading, thereby restricting optimum utilisation.

The case reveals that :

- Air HQ, while placing the order on firm 'C' set aside the technical opinion and selected a firm which could not even supply a sample for testing, resulting in the supply order being cancelled without financial repercussions.
- Procurement of cables from firms who had been technically approved earlier, after re-tendering, resulted in an extra expenditure of Rs.9.40 lakhs.
- As a consequence of delays in procurement, units were unable to main-

tain the serviceability of airfield lighting which restricted optimum utilisation.

The Ministry stated in July 1989 that the order on firm 'C' had been placed in 'good faith'. However, considering the fact that out of 35 items, the firm had submitted a satisfactory sample only in respect of one item which also required further improvements, the action in placing the full order on the firm in 'good faith' lacks any rationale.

16. Procurement of low noise amplifier for a radar

The Ministry placed a supply order in August 1982 on a firm abroad for the purchase of one set of low noise amplifier (equipment) for a radar at a cost of Rs.9.49 lakhs. According to the supply order, the equipment was warranted against manufacturing defects for a period of twelve months after delivery. The equipment was received in June and installed in July 1984. In July 1984 itself, the equipment became unserviceable after 264 hours of operation. The firm was immediately approached for free replacement or repair under the warranty clause. As advised by the firm, the equipment was sent to them in October 1984 for investigation.

After investigation, the firm rejected the right to claim under the warranty clause on grounds that the unserviceability of the equipment was due to malfunctioning of another component called TR tube used in the radar. After protracted correspondence, the firm, in May 1988, offered to repair the equipment only on payment of minimum repair charges of Rs.2.63 lakhs.

The Radar and Communication Project Office stated in October 1988 that due to insufficient infrastructure in the country to investigate the causes that led to the failure of the equipment, the technical opinion of the manufacturer had to be accepted. Pending the repair of the equipment the requirements of the radar were met by divert-

ing another equipment from a separate location, where it was available pending the commissioning of a radar.

The Ministry stated in September 1989 that the firm had agreed in June 1989 to repair the equipment free of cost as a very special case against their normal policy.

The equipment has been lying idle in an unserviceable condition for over five years. It was seen in Audit that the supply order was defective, in as much as the warranty clause did not specify what would constitute a manufacturing defect and whose opinion would be final. The fact that the firm finally accepted the liability is purely fortuitous. There is need, therefore, for Government to review and restructure contract documents in regard to procurement of costly equipment of this type. The Ministry stated in September 1989 that this suggestion of Audit had been "well taken".

17. Procurement of air defence equipment

In order to meet the urgent air defence requirements of the Air Force (IAF), Government approved, in June 1982, the procurement of 15 sets of a particular type of equipment and five sets of automatic data handling system (system), by import, at a cost not exceeding Rs.45 crores. It was decided to constitute a Negotiating Committee which would function under the directions of a Guidance Committee.

An IAF delegation visited country 'M' in June 1984 to assess the suitability of the equipment and the system. The delegation reported that the equipment along with its system would meet the IAF's requirement subject to satisfactory evaluation. The Negotiating Committee, therefore, decided in July 1984 to defer the selection of the equipment offered by the four firms. A memorandum projecting the IAF's immediate requirements of 15 sets of equipment and five sets of the system and seeking clarifications on the equipment was sent to country

'M' in July 1984. In response, the supply of eight sets of the equipment only at the rate of two sets per year during 1987-90 was offered in November 1984. The system, however, was not offered. Also, there was no response to the IAF's request to evaluate the equipment to assess its suitability. Air HQ observed that apart from the system, the associated communication equipment was essential for the full operational utilisation of the equipment. In November 1984 it was brought out during discussion with the specialists of country 'M' that for the effective use of the equipment, apart from the system, certain other equipment would also be required. Air HQ, therefore, decided to resume negotiations with the firms A, B, C and D with whom negotiations had taken place prior to the offer of country 'M'. Except firm 'C', others were not in a position to demonstrate their equipment even in their countries. By that time, country 'M' had improved the delivery schedule of its equipment and offered three out of eight equipment in 1985. The Guidance Committee decided in February 1985 that the eight sets of equipment also offered by country 'M' be accepted and efforts be made to obtain the requisite sets of the systems and related equipment. The Guidance Committee further decided to resume negotiations with the firms for procurement of seven sets of equipment and two sets of the system.

Approval of Government was obtained in March 1985 for the procurement of eight sets of equipment together with three sets of the system and associated equipment at a cost not exceeding Rs. 64 crores from country 'M'.

A Ministry of Defence (Ministry) delegation visited country 'M' in April 1985 to conclude an agreement for the procurement of the equipment and the systems. Country 'M', however, expressed its inability to offer the system immediately. An agreement was, therefore, concluded in April 1985 for the procurement of eight sets of the equipment together with some support

equipment at a total cost of Rs.48 crores. No live evaluation was, however, carried out before concluding the contract. The Ministry, however, stated in August 1989 that technical and operational details of the equipment were obtained and its suitability ascertained before concluding the contract.

Although negotiations with the firms were resumed after the contract was concluded, Air HQ viewed that it would be prudent to procure all the 15 sets of the equipment from country 'M'. Negotiations with the firms were, therefore, suspended. In the meantime, country 'M' had offered two more sets of the equipment to be delivered during 1989-90 at a total cost of Rs.10.35 crores as against the pending request of seven sets. While examining the offer, the Ministry observed that the utility of the equipment would be sub-optimal without the system. It observed further that in the absence of a response from country 'M', the IAF would have to explore the availability of the system from alternative sources.

Approval of the Government was, however, obtained in November 1985, for negotiating the package and signing the contract with country 'M' for the procurement of two sets of the equipment and associated spares at a total cost of Rs.11.86 crores. The automatic data handling system of country 'M' was subsequently evaluated by an IAF team of specialists in September 1986 and, on the basis of its recommendation, Air HQ concluded that the system did not meet their requirements and its procurement would not be cost effective. In fact, this evaluation ought to have been made earlier in the interest of system optimality.

The Ministry stated in August 1989 that the system in question was, for the first time offered for evaluation in July 1986 and did not meet the IAF's requirement. Therefore, it was decided that the indigenous system which is still under development, should be compatible with the foreign equipment and these will fill the gap as and when they are available. The Ministry further stated that

the system provides an additional advantage to integrate two or more equipment. As confirmed by the Ministry, apart from non-availability of the system, no other communication equipment was procured.

The contract for the procurement of two sets of the equipment and associated spares approved in November 1985 was concluded only in March 1987. By this time, the cost had increased from Rs.11.86 crores to Rs.15.25 crores due to variations in the exchange rate. While the equipment contracted in April 1985 was received and its deployment commenced from 1986 onwards and its delivery would be completed by 1990, the system has not been procured till date either from abroad or domestically.

No indigenous facilities have been set up for the repair and overhaul of the equipment. The supplier had intimated that such facilities would be considered only after 1990. Government sanctioned in June 1987 the repair, including defect investigation and overhaul, of the unserviceable equipment by the supplier at a total cost not exceeding Rs.15 lakhs till March 1988 or such time as the indigenous repair facilities are established by the IAF. Since there was no clear provision in the contract, the supplier did not agree to undertake the repair work before 1989. The sanction, therefore, could not be operated upon.

The Ministry stated that a separate contract for repair would be taken up later as provided in the purchase contract. The fact, however, remains that the supplier did not agree to undertake the repair work before 1989 and no contract for such repairs has been concluded till date. As a result four printed circuit boards are held unserviceable from 1987 and an additional 16 since 1988. According to the Ministry, the setting up of indigenous repair facilities would be taken up only in 1990 and from the past trend it is likely to take at least three years for setting up the repair facilities.

The case reveals that :

- there was inadequate appreciation of total requirements as revealed by the fact that aside from the main equipment and the data handling system, it became necessary to have associated communication equipment as also other (auxiliary) equipment for the full utilisation of the main equipment;
- ten sets of the equipment were procured from country 'M' in two lots at a total cost of Rs.63.25 crores without adequate evaluation and without the required system;
- as against the IAF's urgent need of 15 sets of the equipment for filling the air defence gap, only 10 sets were procured. The deployment of the equipment commenced only in 1986 and is scheduled to be completed by 1990;
- the system required for optimising the equipment has not been procured till date resulting in a sub-optimal investment of Rs.63.25 crores; and,
- the suppliers did not agree to undertake the repair work before 1989 while the establishment of the indigenous repair facilities would be considered only after 1990.

18. Procurement of special tools for crash fire tenders

Based on an Air Headquarters (HQ) indent of August 1979 for the procurement of special tools to maintain imported crash fire tenders, the Department of Defence Supplies (DDS) placed a supply order in November 1979 on a firm abroad for Rs.4.56 lakhs. As per the agreement, the supplier was to send shipment advice within three days of shipment and all documents including invoice and packing notes within seven days of shipment. The consignment was received in January and February 1981 at an equipment depot (ED) without the invoice and packing notes. The items were taken on charge after inspection but no discrep-

ancy report was raised in the absence of the wanting documents.

In May 1982, the local agent of the firm sent copies of the invoice and the packing notes based on which, the ED reported discrepancies of 47 items in full and 13 items in part amounting to Rs.1.34 lakhs in November 1982. Correspondence with the firm progressed unsatisfactorily over the next three years and in April 1986, the firm stated that the consignment had been inspected by an officer of the High Commission of India, London, in March 1980 in terms of the contract and he had certified the completion of the order. The firm also stated that since their unconditional performance bond covering this delivery was returned to them without any deduction or restrictions, they were not liable in any way.

In September 1986, Air HQ requested the DDS to short close the supply order at the risk and expense of the supplier. In February 1987, the DDS informed Air HQ that the abnormal delay in raising the discrepancy report had given an opportunity to the firm to disclaim any responsibility for the deficiency. Subsequently, in March 1987, Air HQ advised the ED to regularise the deficiencies in the normal manner. The Ministry stated in August 1989 that the Court of Inquiry proceedings were under finalisation. Meanwhile, necessary tools had been procured in November 1988 from another firm abroad at a cost of Rs.1.50 lakhs.

It was noticed that the supply order provided for the release of 98 per cent payment through a letter of credit against presentation of stipulated documents including invoices and packing list and bank guarantee for 5 per cent of the value of the order. Although Air HQ was intimated in October 1980 itself by Embarkation HQ that the Bill of Lading had been received it was not verified by Air HQ whether packing notes and invoices had been received which were a precondition to payment. The Ministry, however, maintained in August 1989

that the supplier was responsible for the wanting documents. The case resulted in a loss of Rs.1.34 lakhs due to short receipt of tools and an extra expenditure of Rs.1.5 lakhs on their procurement afresh. In addition, there was a seven year delay in the procurement which had adversely affected the repair and overhaul of the crash fire tenders. The float stock of gear boxes had to be used to keep the fire tenders operational.

19. Damage to a tower crane

The Radar and Communication Project Office (RCPO) placed a supply order in December 1986 on a firm for the manufacture, supply, erection, commissioning and testing at site of a tower crane required for the installation of a radar at a station at a cost of Rs 25.11 lakhs. According to the supply order, the crane was to be commissioned and handed over by February 1987 or earlier. Training to the crew for its operation and maintenance was also specified.

The stage inspection of the crane was carried out at the firm's premises by the Directorate of Technical Development and Production (Air) (DTDP (Air)) in February 1987 and cleared provisionally for movement to the site for erection. The crane was erected and commissioned in June 1987. The inspection note and joint inspection reports were signed by the representative of the firm as well as DTDP(Air) in June 1987 although some technical activities relating to rectification of defective and deficient items were pending. Even though it had been mentioned in the inspection report that weather vaning had been checked, this had not actually been done by the DTDP (Air) nor demonstrated by the firm's representatives. (Weather vaning is self-alignment of the jib of the crane by free rotation in the direction of the wind so that least resistance is offered to the wind when the crane is not in use). In June 1987 itself, the crane was extensively damaged during conditions of heavy storm and high velocity winds.

A court of inquiry convened between June and August 1987, determined that there was failure on the part of the firm to weathervane the crane after it was used last. It also held the firm responsible for not training the crew in operating and maintaining the crane. Serious lapses on the part of DTDP (Air) in inspection and acceptance were also pointed out. The court recommended in August 1987 that the cost of the crane amounting to Rs 25.11 lakhs be recovered from the firm.

However, no recovery has been made even though a legal notice was served on the firm in June 1988. The supply order did not provide for arbitration in the event of a dispute. But for the DTDP(Air) signing the joint inspection report pending the rectification of certain defective and deficient items, the total liability would have clearly rested on the firm. Moreover, it authorised full payment to the firm as well as release of its bank guarantee. The Ministry stated in September 1989 that the proceedings of the court of inquiry had been forwarded to the administrative authority for taking action against the inspector held responsible.

The task at the station is, in the meanwhile, being managed by obtaining a crane on loan from Air Headquarters (for which an expenditure of Rs 1.52 lakhs had been incurred on modification) and by hiring a crane privately for a period of six months at a cost of Rs 10.50 lakhs. The radar installation programme at the station has slipped seriously. The unit was expected to be installed in October 1989 as against March 1986 originally. The Ministry stated in August 1989 that the delay in installation of radar was mainly due to non-completion of civil works at site and collapse of the crane. It added that another notice was being served on the firm and in case of failure on its part to fulfil the contractual obligations, legal action would be initiated. The case, nevertheless, reveals laxity in inspection. The loss of the crane worth Rs.25.11 lakhs had also

led to considerable delay in the commissioning of the radar station.

20. Procurement of night vision goggles

In order to enhance the night operational capability of the helicopter fleet, Air Headquarters(HQ) raised an operational demand in November 1982 for import of 50 sets of night vision goggles (NVG) at an estimated cost of Rs.93.75 lakhs. Due to financial constraints and the possibility of indigenous manufacture of NVGs by the Instruments Research and Development Establishment (IRDE), it was finally decided in October 1984 to import 25 NVGs to meet urgent needs and to develop 35 sets indigenously. Accordingly, the Ministry of Defence sanctioned the import of 25 NVGs in May 1985 through IRDE at a cost not exceeding Rs.65.08 lakhs and the indigenous development, manufacture and supply of 35 NVGs to the Air Force by IRDE at an estimated cost of Rs.64.5 lakhs (including Rs.40.20 lakhs in foreign exchange). The IRDE placed a supply order in May 1985 on a firm abroad for the supply of 25 NVGs with accessories and spares at a total cost of Rs.65.41 lakhs. According to the supply order, the equipment was warranted for 240 days after delivery and the firm had also to provide on best efforts basis all information regarding the type of filter glass to be used in cockpit instrument panels and on other light sources for achieving NVG compatibility.

The IRDE received 25 NVGs and issued them to an equipment depot in July 1986. Although these were further issued to different helicopter units (HU) during 1986-87, none of the units could use the NVGs for want of necessary user instructions. Finally, in 1987-88, these were returned to HU 'X' which was centrally authorised to conduct trials with the help of the Aircraft and Systems Testing Establishment and submit its report for finalisation of the detailed instructions for their use.

The Air HQ was aware that the essential pre-requisite for any helicopter operation with NVG was its compatibility with cockpit lighting and had stated in May 1984 that necessary modifications in this regard could be done within one month of the decision regarding the NVG to be procured. In April 1989, the Air HQ stated that part of the modification had been carried out and that the interim modification being carried out to cockpit lighting would take one year to complete at an estimated expenditure of Rs.38,400. It was further stated that training of pilots would be undertaken in a phased manner and that detailed instructions were under finalisation. The Ministry stated in August 1989, that training to six pilots had commenced at H.U. 'X' and the draft standard of preparation also finalised. More pilots would be trained after gaining adequate experience.

The development and manufacture of indigenous NVGs was undertaken in early 1985 and the development and production model was evaluated in October 1985. During further trials carried out in June 1987 after the manufacture of the NVG, it was pointed out by Air HQ that the excessive brightness of the image intensifier tube (IIT) used in the NVGs resulted in poor picture quality as compared to the imported NVG. The IRDE stated that the best quality of the IIT available abroad had been used and no improvement was possible. In July 1987, Air HQ agreed to accept these NVGs and to supply the helmets for their integration. The NVGs were supplied in September 1988 and centrally allotted to HU 'X'. According to IRDE the shelf life of IITs was two years and operational life was 1000 hours irrespective of the shelf life already spent. Although the shelf life of the IIT used in these NVGs had already expired, the NVG's could not be put to any significant use till April 1989. However, the Ministry stated that these tubes had no fixed shelf life and once fitted had an operational life of 2000 hours. The basis of this had not been furnished. Poor

picture quality as compared to imported NVG had to be accepted in an equipment specially developed for night flying. The Ministry stated in August 1989 that the IITs were stored under ideal conditions to ensure maximum shelf life. The excessive scintillation of IITs used in NVGs produced by IRDE did not affect vision. The fact that Air HQ had complained of poor picture quality was not denied by the Ministry.

The case reveals that:

- the NVGs procured in July 1986 and September 1988 at a cost of Rs.129.6 lakhs could not be put to use till April 1989 due to delays in carrying out the modifications in cockpit lighting, issue of detailed instructions and imparting training to the crew.
- the night operation role of helicopters could not be practised.
- the warranty of NVG's procured from abroad and the shelf life of IIT as indicated by IRDE had expired much before the NVGs could be put to use.

21. Over-provisioning of aircraft spares

The phasing out of an aircraft started in April 1977 and by March 1989, 27 had ceased to be in service. Nonetheless, spares for these aircraft continued to be procured and a large quantity of spares ordered from abroad during 1976 to 1979 and received during 1978 to 1981 were continued to be held by the Air Force.

During August and October 1976, the Air Headquarters (HQ) placed two indents on the Supply Wing (SW) of an Indian mission abroad for the procurement of 650 pipe flex assemblies. As the price quoted by the foreign firm was abnormally higher than that mentioned in the indent, the quantity was reduced to 326. Contracts were concluded in December 1976 and March 1977 at a cost of Rs.7.15 lakhs for the supply of 326 pipe flex assemblies, which were received between November 1978 and December 1979. During a ten year period ending March 1989,

ten pipe flex assemblies had been utilised, leaving 316 assemblies costing Rs.6.93 lakhs.

Air HQ stated in February 1989 that, normally, provisioning was based on the average annual consumption and the dues out. But, in this particular case, the records being old, the correct position could not be confirmed. Air HQ, however, agreed that the computerised review statement had been altered manually, as a result of which the quantity worked out for provisioning was incorrect.

In a second case, Air HQ had placed an indent in May 1978 on the SW for the procurement of 100 fastener rods. The SW concluded a contract in September 1978 for 42 rods at a cost of Rs. 0.25 lakh which were received between August 1980 and March 1981. At the time of placing the indent, the Air Force was already holding a stock of 178 rods since September 1977. Only three fastener rods were issued till March 1989, leaving a balance of 217 valued at Rs. 1.64 lakhs.

Air HQ stated in February 1989 that reasons for the procurement of the additional quantity could not be ascertained as the records were not available but accepted that the provisioning had not been correctly done.

The Ministry of Defence stated in August 1989 that the provisioning was done by Air HQrs to meet future requirements of the aircraft on the basis of the extended unit establishment. This led to excess provisioning and it appeared that the review details on which it was based were not correct though the incorrect computer outputs were manually corrected as a general practice. It added that the possibility of utilising the spares for other common aircraft was being explored.

In summary, even though the aircraft was being phased out and a substantial quantity of the particular spares existed, provisioning action continued to be taken. This has resulted in unnecessary purchases worth Rs.7.18 lakhs. Also, incorrect computer outputs requiring manual correction points to

the need to review and improve the automated provisioning system.

22. Procurement of Klystron tube and Klystron amplifier

Klystron tube is used in a radar to boost the low level microwave signal to the required level. Air Headquarters (HQ) raised an indent in July 1983 on the Supply Wing of a mission abroad for the procurement of five tubes based on which a contract was concluded in December 1983 with a proprietary firm at a total cost of Rs.29.48 lakhs. As per the contract, the warranty was for 18 months after delivery of the items or 2,000 filament hours whichever was earlier. The consignment containing five tubes was received in January 1985. One tube issued to a user unit in March 1985 failed during acceptance test. Air HQ forwarded a copy of the defect report to the Supply Wing in June 1985 and requested them to approach the firm for a free replacement as the tube was covered under warranty. The defective tube was sent to the firm in December 1985. The firm informed the Supply Wing in June 1986 that they had examined the tube and found that the tube had become unserviceable due to user manipulation. Accordingly, the firm refused to provide free replacement under warranty. Air HQ contested this issue with the firm. In September 1988, the firm agreed to supply the warranty replacement in case another indent for five tubes was placed on them. Accordingly, Air HQ concluded a contract in November 1988 for the supply of five tubes at a total cost of Rs.59.86 lakhs. These tubes had been received by August 1989.

Klystron amplifier is used in a radio frequency power amplifier to boost the low level microwave signal to the required level. Air HQ placed an indent in January 1982 on the Supply Wing for procurement of 32 amplifiers based on which a contract was concluded in June 1982 with the same firm on which an order was placed for Klystron

tubes at a total cost of Rs.13.94 lakhs. As per the contract, the warranty was 15 months after the delivery or 12 months after the arrival of the stores at the ultimate destination in India whichever was earlier. Twenty two amplifiers representing the first batch of delivery duly inspected and approved in March 1983 by the Supply Wing, were received by the consignee in September 1983. Of these, eight amplifiers were found defective between January and March 1984 during functional test. The matter was reported to the Supply Wing between February and May 1984 requesting them to arrange immediate replacement under the warranty clause. The eight defective amplifiers were despatched to the firm in February 1986 for defect investigation. The firm informed Air HQ in June 1986 that out of eight amplifiers sent to them, four amplifiers were serviceable and the remaining four became defective as the filament was brought by the user to a voltage exceeding the normal level. Accordingly, they refused free replacement under warranty. The four serviceable amplifiers were returned in December 1987. In May 1988, Air HQ concluded that protracted correspondence had taken place between them and the firm and no useful purpose would be served in pursuing the matter further. The consignee was requested to initiate regularisation action. The Ministry stated in August 1989 that the firm had again been requested to accept their liability under warranty.

The case reveals the following:

- Even though the defects in the tube and the amplifiers were brought to the notice of the firm within the warranty period, the firm did not agree to accept the liability based on their own investigation. After considerable persuasion, the firm agreed in September 1988 to replace the defective tube only on the condition that five tubes be ordered on them at rates 103 per cent higher than those of 1983.

As regards amplifiers costing Rs.1.74 lakhs, the matter has not been finalised yet.

The contracts left it to either party to prevail upon the other in the event of a dispute. Also, the warranty clause did not specify what would constitute a manufacturing defect and whose opinion would be final. There is, therefore, a need for Government to review, contract documents in regard to such type of procurement.

23. Brake system of Ajeet aircraft

The Ajeet aircraft inducted in the Indian Air Force in April 1978 is an improved version of the Gnat aircraft. It has a higher fuel carrying capacity which at the time of its production necessitated the introduction of a Maxaret unit for effective braking. This new brake system was designed and developed by a public sector undertaking (PSU) alongwith this aircraft. The new system had continuous problems since its development and was unreliable. In order to avoid accidents due to brake failure, Air Headquarters (HQ) decided in August 1983 to prescribe the mandatory use of tail parachutes on every landing till the problem was resolved. In February 1989, the Air HQ stated that after continuous developments and modifications carried out by the PSU, as a part of their research and development work, the brake system had now become reliable.

The failure in the brake system had resulted in the Ajeet fleet being grounded from June to September 1982 and April to August 1983, thereby imposing an operational limitation on the Air Force. The Ministry of Defence stated in September 1989 that during this period limited training was imparted to the aircrew on Hunter trainer aircraft.

Further there were 68 incidents of brake failure between September 1978 and March 1988. In four incidents, aircraft costing Rs.2.89 crores were rendered beyond economical repairs whereas in one other

case the repair cost had not been ascertained. The total loss due to the remaining 63 incidents including eight that occurred during the mandatory use of tail parachute was Rs.1.10 lakhs besides the cost of components replaced.

800 tail cones costing Rs.26.64 lakhs were procured during January 1986 and March 1988 due to a spurt in consumption because of the mandatory use of tail parachutes on every landing. Taking into account the average consumption of the last two years, there appears no possibility of utilising 500 tail parachutes worth Rs.16.65 lakhs during the service life of the aircraft.

The Air Force incurred an expenditure of Rs.4.91 lakhs for incorporating the modifications made by the PSU on the brake system of the Ajeet fleet.

The failure to detect defects in the design of the brake system during the extensive trials carried out before its introduction and the delay of ten years in carrying out the modifications had resulted into losses worth Rs.2.90 crores and extra expenditure of Rs.31.55 lakhs to the state.

24. Bulk petroleum installations

A contract, valid for 20 years, was concluded by the Ministry of Defence (Ministry) with Indian Oil Corporation (IOC) in November 1962 for the construction of Bulk Petroleum Installation (BPI) at IAF airfields and for the storage and supply of aviation fuels on terms and conditions which were broadly as follows:-

- the entire cost of construction of the BPIs was to be borne by IOC;
- land for the BPIs would be made available to IOC on payment of 10 per cent of the normal rent assessed;
- supply of aviation fuels would be regulated by separate contracts to be entered into with the DGSD;
- additional tankage capacity required by the Government would be provided by mutual agreement;

- a sum of 2 per cent of the price of fuels which the IOC had failed to supply for each month or part of a month during which the supply was in arrear, would be recovered as liquidated damages;
- repair, maintenance and general upkeep of the BPIs was the responsibility of IOC at their cost;
- the BPIs were to be constructed by the IOC at 24 airfields;

BPIs at all the 24 airfields were constructed by IOC between March 1963 and November 1964. In August 1965, it was decided to transfer the IAF BPIs to IOC for reasons of economy, operational efficiency and proper quality control. For these BPIs IOC was required to pay interest. Although rental was payable by IOC for BPIs taken over from the IAF, no clear norms were finalised to assess the rental liability of IOC. The outstanding recovery of Rs.25.11 lakhs from IOC on account of rental charges for land and other assets up to March 1976 was commented upon in paragraph 49 of the Report of the Comptroller and Auditor General of India for the year 1976-77, Union Government (Defence Services). A further review of the position by Audit revealed that an amount of Rs.3.17 lakhs was due for recovery from IOC from April 1979 to March 1988 on account of rent for land given to it at five airfields. The amount to be recovered from IOC for land given to them at the remaining 19 airfields was, however, not furnished by the Ministry. The liability of IOC towards rental charges for IAF BPIs taken over by them, amounting to Rs.63.42 lakhs over the last 18-20 years was still awaiting recovery (March 1989).

IOC was unable to maintain the prescribed stock level of aviation fuel as required. There were numerous instances when stocks were allowed to touch the warning level. However, no liquidated damages were levied and recovered from IOC for this failure though the agreement provided for levy

of such liquidated damages. Between June 1972 and January 1981, twelve Forward Base Support Units (FBSU) were established by the Air Force. Limited additional tankage was required to be built at these FBSUs in order to maintain a minimum stock level of aviation fuels for operational requirement. By November 1982, the 1962 contract with IOC had expired. Thereafter, IOC did not agree to construct the BPIs at their own cost as it was considered to be commercially unviable. Instead, the IOC suggested that the construction of additional BPIs for the Air Force be taken up as 'deposit work'. A contract was concluded with IOC in December 1988 only. The cost of construction of secured tankage was to be borne by the Government. The IOC had the option either to purchase the IAF BPIs or pay rental per annum at the rates envisaged in the contract. Similarly, rental was also payable by IOC for the land given to them for construction of their own BPIs. The BPIs for the additional requirement were not still available.

A sum of Rs. 44.52 lakhs deposited with IOC between December 1986 to October 1988 for the construction of BPI at a particular airfield remained blocked as the construction had not commenced. The construction had not commenced as clear land was not handed over to the IOC as required.

Thus, a rental of Rs.63.42 lakhs remained unrecovered from IOC for the last 18-20 years due to non-finalisation of clear norms on the subject. Besides, delay of six years in finalisation of contract with IOC resulted in non-availability of additional BPIs and secured tankage affecting the IAF in operational terms. Their delayed construction would entail considerable extra expenditure. An amount of Rs.44.52 lakhs paid to IOC in 1986 and 1988 for putting up of additional BPI at one airfield remained locked up without any return. Liquidated damages on account of not maintaining the required stock of aviation fuels in the BPIs by IOC have also not been levied by the IAF so far.

The matter was reported to the Ministry in July 1989; reply has not been received (November 1989).

25. Induction of a helicopter

In 1983, Government learned that the production of MI-8 helicopters in service with the Air Force (IAF) was likely to be closed from 1984. A decision was, therefore, taken to induct MI-17 helicopters to replace MI-8 helicopters. No alternatives to the MI-17 were considered nor was an Air Staff Requirement (ASR) drawn up by Air Headquarters (HQ) to indicate the technical and cost parameters of the helicopters which it wanted as a replacement of the MI-8 helicopters. Although the Ministry of Defence (Ministry) contended in September 1989 that MI-17 helicopters were not to replace the MI-8, an Air HQ task directive of November 1983 states, inter alia, that the MI-17 was to be evaluated as a replacement for the MI-8. Similarly, the Ministry have stated that there was no need for an ASR since the MI-17 was an improved version of the MI-8. However, since performance characteristics and costs of the MI-17 were distinct when compared to the MI-8, the framing of an ASR appears to have been necessary.

An evaluation team assessed the helicopters in November 1983 and recommended its suitability as a replacement for MI-8 helicopters provided certain modifications were made. It also recommended that servicing facilities for systems uncommon with MI-8 helicopters would need to be set up. Further, the timely procurement of spares, test equipment, ground support equipment, specialist vehicles and training aids was also emphasised.

In November 1985, the Government approved the procurement of 47 MI-17 helicopters together with associated equipment at an indicated cost of Rs.124 crores. It directed that a draft agreement be obtained from the manufacturer and its technical aspects, prices and delivery schedule, be negotiated. Accordingly, a negotiating team

visited the country of manufacture and negotiated a contract with the manufacturer in January/February 1986. An additional six helicopters required for the Ministry of Home Affairs (MHA) were also negotiated and a working protocol for procurement of 53 helicopters was signed in February 1986. The unit price of the helicopter along with optional equipment was negotiated at Rs.2.38 crores. This did not include the cost of spares and ground equipment. Nor did it include training costs.

After signing the working protocol, Air HQ noticed that the helicopters would not be wired for weapon delivery which was required for the operational role envisaged for these helicopters. A draft addendum to the main contract was, therefore, sought from the manufacturer for the armament wiring of 37 helicopters. This was concluded in May 1986 and the manufacturer was paid Rs.2.62 crores for the modification and wiring of 37 helicopters required for weapon delivery. Since armament wiring was standard fitment on MI-8 helicopters and it had been confirmed, during evaluation, that the MI-17, like the MI-8, was wired for armament delivery, it was incumbent on Air HQ to have pointed this out to the negotiating team. The Ministry accepted the omission. The contract for the procurement of 53 helicopters, ground support equipment and spares for 22 helicopters (16 for IAF and 6 for MHA) at a cost of Rs.138.35 crores was concluded with the manufacturers, in February 1986. According to the delivery schedule, 16 helicopters were required to be delivered in 1986, 18 in 1987 and the balance 19 in 1988.

The spares for the remaining 31 helicopters were not contracted in order to accommodate the cost of wiring for weapon delivery in 37 helicopters (which was not foreseen) within the financial sanction. Air HQ, therefore, proposed in July 1986 that maintenance spares and ground support equipment for the remaining 31 helicopters for the IAF be procured at an estimated cost of

Rs.7.82 crores. The Ministry approved the proposal as the spares projected were required essentially at the initial stage for the operation of the helicopter fleet. Accordingly, the contract for the procurement of spares for these helicopters was concluded in December 1987. The prices charged by the manufacturer were higher by 28 percent when compared to the rates quoted earlier for similar items under the contract of February 1986 and the financial impact of concluding two different contracts for maintenance spares was Rs.26.23 lakhs.

The draft offers from the manufacturer for the deputation of specialists for imparting technical maintenance training to IAF personnel and for the procurement of training aids were received in February 1986. It did not provide for full range of training aids. After negotiations, the manufacturer agreed to offer additional items of training aids in May 1986. Air HQ submitted the proposal for processing the draft contracts only in August 1986. By that time, the deadline for signing the contracts had expired. The manufacturers withdrew the draft offers in December 1986. The prices in the revised contracts received afresh in March 1987 stood increased by 20 percent for training aids and 12 percent in respect of deputation of specialists. The contract for the deputation of specialists was concluded in June 1987 and that for training aids was concluded in December 1987. This involved an extra expenditure of Rs.16.65 lakhs on training aids alone. Further, while the training aids were scheduled to be delivered by June 1988, the induction of helicopters had commenced from April 1987 onwards.

It was seen that while the procurement of the helicopters was approved in November 1985 (and contracted in February 1986) and 40 helicopters were received during December 1986 to December 1987, only one helicopter unit was formed in March 1987. The proposal to raise the second unit was initiated only in June 1987. By that time, 6 helicopters out of 10 allotted to the

unit had already arrived. The formation of the second unit, however, was sanctioned only in April 1988. The estimates for the civil works, including the technical and operational accommodation, costing Rs.4.42 crores required for the helicopter unit was included in the proposal put up for the approval of CCPA in August 1988 for sanctioning the manpower for the second helicopter unit. According to the Ministry, (September 1989) the approval for commencing work services was to be sought later at appropriate time.

The case reveals the following:

- extra expenditure of Rs.2.62 crores for the modification and wiring of 37 helicopters required for weapon delivery;
- extra expenditure of Rs.26.23 lakhs due to conclusion of two different contracts for spares;
- extra expenditure of Rs.16.65 lakhs due to delay in conclusion of contract for training aids; and
- there were obvious weaknesses in induction planning ranging from a delayed maintenance arrangement to a mismatch between the setting up of the helicopter units (and associated civil works) and the arrival of the helicopters.

26. Induction of a heavy transport aircraft

Government approved in March 1983 the induction of IL 76 MD aircraft in the Indian Air Force (IAF) for meeting its heavy transport requirements. Six aircraft and eight spare engines and another two aircraft with two spare engines were contracted from a foreign supplier in December 1983 and October 1984 respectively.

As against a requirement of 20 aircraft, provision for only 12 aircraft had been made by Air Headquarters (HQ) in the 1985-90 plan. Government approved in November 1985 the procurement of six aircraft for

the IAF. In addition, approval was also accorded for the procurement of three aircraft for the Cabinet Secretariat. Consequent on Government's approval of November 1985, negotiations were conducted in May 1986 by the IAF representatives with the manufacturers and a working protocol signed in May 1986. According to the protocol, the manufacturers had agreed to the following:

- To deliver four aircraft in 1987, three aircraft in 1988 and two aircraft in 1989.
- The cost of one aircraft would be Rs 35.35 crores and the cost of one engine would be Rs 1.72 crores. The price was valid for deliveries in 1987 and the prices for the deliveries in 1988 and 1989 would be escalated by 3.6 percent per annum.
- The contracts for delivery of aircraft in 1988 and 1989 would be concluded not later than 1st April of the year preceding the year of delivery.

Government concluded a contract in January 1987 for only two aircraft to be delivered during 1987 at a cost of Rs 39.03 crores per aircraft and two engines at a cost of Rs 1.90 crores per engine. The second contract for the supply of two aircraft during 1987 at a cost of Rs.40.36 crores each and two engines at a cost of Rs.2.04 crores each was concluded only in June 1987. Due to the delay in concluding the second contract, Government had to incur an extra expenditure of Rs.2.94 crores besides delay in induction of the aircraft.

The Ministry stated in August 1989 that the offer of the manufacturer for the two aircraft was received in December 1986 and the contract was concluded in January 1987. The offer for the remaining two aircraft was received in May 1987 and contract concluded in June 1987. However, the aircraft contracted in June 1987 were delivered in April 1988. According to the Ministry, the price variation between the two contracts was chiefly on account of changes in the

exchange rate and partly on account of escalation in the cost of engines.

There had been further delays in concluding the contract for the aircraft to be supplied during 1988. The contract for supply of three aircraft to be delivered during 1988 at a cost of Rs.43.50 crores per aircraft and three engines to be delivered within 9 to 12 months from the issue of the letter of credit was concluded only in December 1987. While the difference in the costs of engines procured under these contracts was within the norms of escalation as accepted in May 1986, the escalation charged for deliveries of aircraft during 1988 under the contract of December 1987 was 7.77 per cent as compared to the contract of June 1987. The Ministry have stated that though, as per the protocol, the contract was to be signed by April 1987, the draft offer for the aircraft to be delivered in 1988 was received only in June 1987 and the contract was concluded in December 1987. It added that the escalation factor was 3.6 per cent and the increased price was due to variations in exchange rate. Clearly, deviations from the protocol were either not anticipated or, if anticipated, no methods had been devised to cater for them.

The prescribed overhaul period of the airframe was 5,000 flying hours whereas that of the engine was 2,000 hours or 10 years. Ten engines installed on these aircraft however, were withdrawn prematurely after completing only 9.05 to 38.15 percent of their prescribed overhaul life. The high rate of premature withdrawals of the engines resulted in low serviceability of the aircraft and consequent low utilisation. As against the sanctioned utilisation rate of 66 hours per aircraft per month, the rate achieved by these aircraft during the period 1985 to 1988 was as low as 15.35 to 28.26 hours.

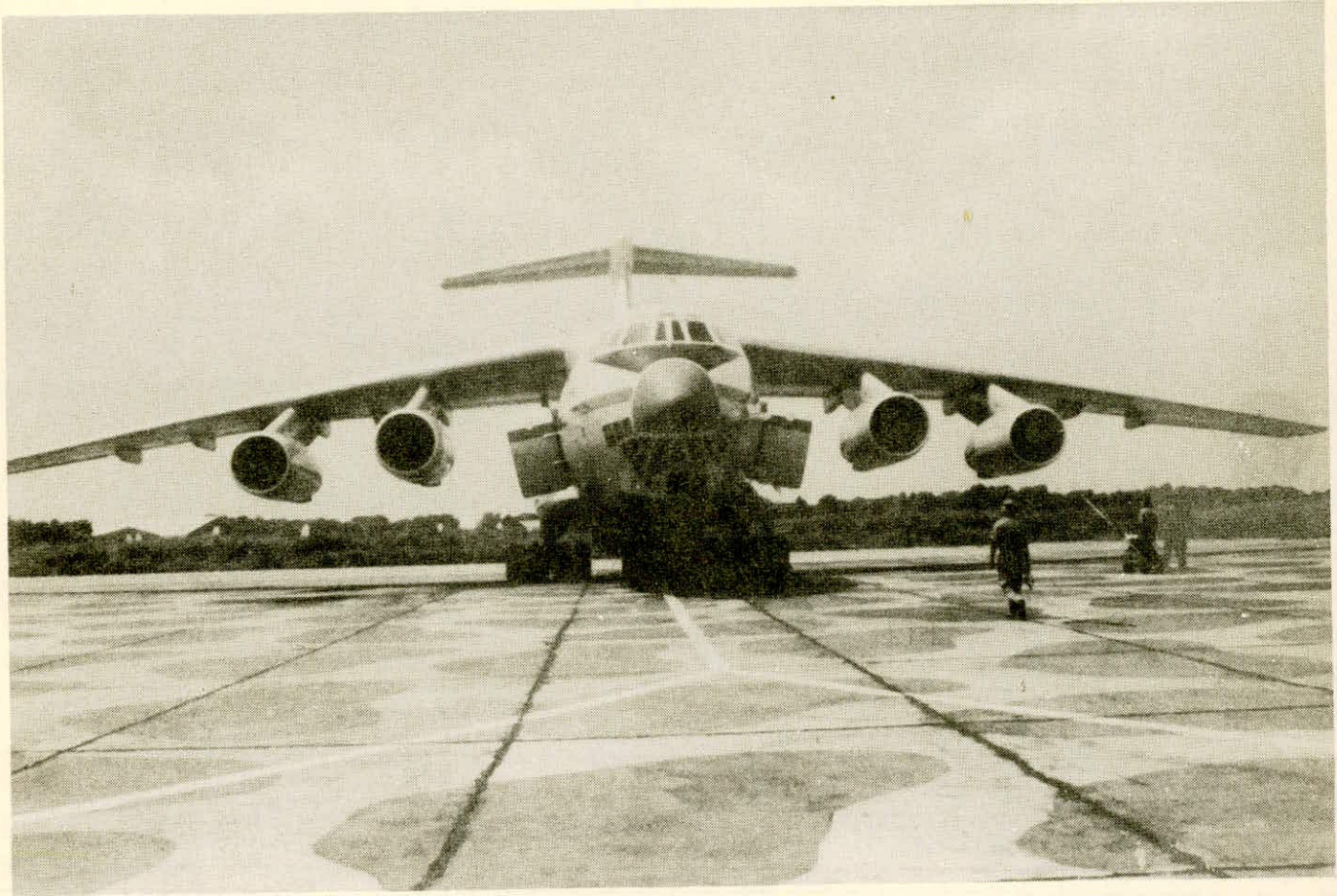
The Ministry stated in August 1989 that although a utilisation rate of 66 hours had been authorised, it was not necessary for each aircraft to fly 66 hours per month. Considering the fact that the fleet

met its operational tasks from time to time, as stated by the Ministry, within the utilisation rates actually achieved (from 15.35 to 28.26 hours) it would appear that the IAF's tasks could as well have been met by a smaller fleet.

As a consequence of the exceptionally high rate of premature engine failures, the IAF had to procure three additional engines at a cost of Rs.6.36 crores in December 1987 to maintain the operational status of the fleet since 9 out of 10 spare engines procured under the contract of December 1983 and October 1984 had already been utilised to replace the engines withdrawn prematurely. Thus the IAF had to incur an additional expenditure of Rs 6.36 crores on the procurement of three spare engines which otherwise would not have been required.

Also, rotables were withdrawn much before completing their prescribed overhaul life. During the period between August and November 1987 there had been 16 withdrawals of constant speed drive (CSD) turbine units between 500 and 700 flying hours as against the prescribed overhaul life of 2,000 hours. As a result, 22 CSD turbines had to be procured at a higher rate on aircraft on ground (AOG) priority. Also, due to the non-availability of the CSD turbine units two aircraft were grounded during 1987 affecting the serviceability of the fleet. In addition, there had been five cases of premature withdrawal of gear boxes which were sent abroad for repair at a cost of Rs.3.44 lakhs. Besides, 28 aggregates amounting to Rs.10.72 lakhs were also withdrawn prematurely and sent abroad for repair. According to the Ministry, none of these items have been received back after repair (August 1989).

Though induction of the aircraft was approved in March 1983, the establishment of indigenous repair and overhaul facilities for the aircraft were not planned. Even after the premature failures of engines and rotables, no action was taken to establish indigenous repair facilities. Air HQ have,



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however, taken a view in March 1989 to establish the repair and overhaul facility and have approached the manufacturer for provision of necessary technical assistance for the purpose. In the meantime, 10 engines withdrawn prematurely were sent to the manufacturer for repair at a total cost of Rs 5.71 crores. The IAF has not introduced any preventive measures to avoid the high rate of premature failures of engines and rotables. According to the Ministry, the manufacturers have not so far advised any remedial measures. However, the manufacturers agreed to send a specialist to look into the problem. He has not arrived so far. The Ministry added that the engines were considered prone to failure as there have been 10 more cases of premature failures including two engines that failed during the warranty period. The Ministry have further stated that indigenous repair facilities were not planned during 1983 in view of the small size of the fleet. The cost effectiveness of the establishment of the facilities is now being looked into since the fleet strength has been increased. Though it is true that the fleet size in 1983 was small, yet Air HQ had projected the need for a fleet of 20 aircraft in the 1985-90 plan which could have been used as a basis for evaluating the cost benefits of setting up indigenous maintenance facilities.

In order to provide training to IAF personnel on second line maintenance activities of the aircraft, a team of specialists from the manufacturers was deputed to India under a contract concluded in July 1986. The team so deputed did not have the experts who could provide training on bay-servicing of aggregates in the laboratories which was part of the contract. The deputation of another team of specialists from the manufacturers was, therefore, sanctioned in August 1988 to complete the residual work. The entire expenditure on the second team should have been met by the manufacturers in view of the failure on their part. However, these had to be borne by the IAF

due to ambiguities in the contract provisions. Air HQ stated in December 1988 that action would be taken to stipulate an appropriate clause in future contracts to avoid such situations.

The case reveals avoidable contracting delays resulting in an extra expenditure of Rs.2.94 crores in addition to a poor aircraft utilisation rate arising out of the absence of any preventive measures to avoid the high rate of premature withdrawals of engines and rotables. There would appear to be considerable scope for improved induction planning including a strong maintenance element.

27. Production of liquid nitrogen

In October 1966, a liquid nitrogen plant was procured from abroad at a cost of Rs.2.29 lakhs. The plant was procured to produce liquid nitrogen required for the assembly of aero-engines and shrunk fitting of some of their components in an Air Force Base Repair Depot (Depot). The plant was installed in November 1968 and commissioned in June 1969. It had a production capacity of 12 litres per hour which worked out to an annual production capacity of 26,954 litres. As against this, the annual average requirement of liquid nitrogen between 1969 and 1985 ranged between 55 and 775 litres. The regular production of liquid nitrogen started in August 1971. The plant was in use upto December 1985 after which it was not operated due to non-availability of the required type of oil. During the 15 year period from 1971-72 to 1985-86, the plant had produced 4,440 litres of liquid nitrogen with an annual average production of 296 litres, which was about 1.10 percent of its annual capacity.

Since 1986-87, the requirement of liquid nitrogen was met by the Depot by resorting to local purchase. The total quantity purchased upto September 1988 was 1,050 litres at Rs.10 per litre approximately.

In March 1987, the cost effectiveness of the plant was examined by the De-

pot. It was then found that the cost of production per litre of liquid nitrogen was Rs.65.15 as against the local purchase cost of Rs.10 per litre. The cost of production did not, however, include the element of depreciation on the capital cost of the plant. The Ministry of Defence (Ministry) stated in August/September 1989 that the plant was procured on the advice of a foreign project group as a part of a project to establish overhaul facilities for certain aircraft. Liquid nitrogen was not readily available in the sixties and the requirement of other depots in the Air Force was being met by local purchase. No review of under-utilisation of the plant was done from 1971 to 1985 on the ground that it was not meant for commercial purposes. The Ministry also added that the case for disposal of the plant was pending with Air HQ and that this was the only plant held by the Air Force.

There was nevertheless a gross mismatch between the Depot's requirements of liquid nitrogen and the production capacity of the plant. Additionally, lack of cost consciousness was responsible for the cost effectiveness of the plant not having been assessed either initially or reviewed thereafter until 1987 by which time the plant was non-operational. A timely review could have presented the possibility of the depot meeting its requirements by local purchase as was the case with other depots in the Air Force.

28. Delay in supply of an equipment

Import of power supply and airconditioning vehicles (alert trolley) on the basis of a quotation valid till December 1982 was dropped by the Ministry of Defence (Ministry) on the basis of an assurance by Hindustan Aeronautics Limited (HAL) for the supply of the trolleys by them at 80 per cent of the cost quoted by the foreign firm. In January 1983, Air HQ placed an order on HAL Bangalore for the supply of 12 alert

trolleys which were to be supplied by September 1984. The trolleys were required to provide electrical power, air-conditioning and starting air for the ground support of jet aircraft. HAL, however, subsequently expressed their inability to manufacture the trolley as their work sharing arrangement with the foreign firm had not materialised.

Thereafter, on the basis of a quotation given by the Lucknow Division of HAL in February 1984, an order was placed in April 1984 for the supply of eight alert trolleys at a unit cost of Rs.23.03 lakhs (total cost: Rs. 1.84 crores). The delivery was to be made at the rate of one unit per month from April 1985. The trolley was first offered by HAL in December 1984 for evaluation. After modifications by HAL, user trials were carried out in August 1985. After further modifications and trials the trolley was cleared by the Director Technical Development and Production (Air) in November 1987. However, when the trolley was taken up for conversion for a particular aircraft (November 1988), HAL encountered a fault in the engine system. HAL have now indicated the possible supply of the first two trolleys by March 1990 after getting the engines refurbished.

Meanwhile, an on account payment amounting to Rs.1.57 crores had been made to HAL between December 1984 and June 1987. Further, the trolley, when ready, will cost 37 per cent more than the one offered by the foreign firm.

The Ministry stated in August 1989 that in the absence of the trolley, the requirement was being met by alternative equipment on a make shift basis.

In summary, the alert trolleys ordered in 1983-84 to be delivered by HAL during 1985-86 for which an advance payment of Rs.1.57 crores had been made had not been delivered. Even user trials had not been completed till August 1989 and the supply may commence by March 1990.

29. Infructuous expenditure on the overhaul of an aircraft

A Devon aircraft which met with a flying accident in April 1981 was sent to a public sector undertaking (PSU) in September 1981 for a major overhaul. The overhaul was completed at a cost of Rs.6.89 lakhs after three years in October 1984. The delay was attributed to non-availability of rotatables and shortage of spares. The overhauled aircraft was allotted to Training Command in December 1984. The Training Command, however, did not accept the aircraft as the authorisation to hold the aircraft was valid only up to March 1985. The aircraft, therefore, remained with the PSU till it was ferried in October 1986 to a Base Repair Depot for disposal.

Sanction for the withdrawal of the first batch of the aircraft was issued in September 1983 when the subject aircraft was undergoing overhaul. The withdrawal of the overhauled aircraft was included in a sanction of October 1985. The Base Repair Depot had forwarded, in August 1987, a surplus report to the Director General of Supplies and Disposals, for arranging disposal of the aircraft. The book value of the aircraft in August 1987 was Rs.24 lakhs. Final sanction for its disposal was obtained in December 1988. The aircraft had not been disposed of till September 1989 as the bid received was not found commensurate with the minimum reserve price and therefore rejected.

The Ministry of Defence stated in September 1989 that the aircraft had met with an incident in April 1981 and was due for overhaul. It was inducted for major servicing in October 1981 and though the overhaul had been completed in March 1983 and the aircraft test flown, it could not be ferried out for want of rotatables till October 1984. It also stated that the case for withdrawal of the first batch of five aircraft of this type was initiated in May 1983 only and, hence, the major overhaul of the air-

craft could not be avoided. The Ministry further stated in October 1989 that the aircraft was unserviceable till 26th October 1984 for want of bought out rotatables, the non-availability of which was intimated by the PSU to Air Headquarters (HQ) in December 1982.

The case reveals improper planning in the overhaul of the aircraft and improper monitoring. Though the overhaul of the aircraft had been technically completed in March 1983, yet it remained with the PSU for another 21 months for want of rotatables till October 1984 and was eventually declared for disposal without any utilisation. Had the availability of spares and rotatables been realistically assessed while sending the aircraft for overhaul in October 1981, when it was known in August 1981 itself that the aircraft was to be withdrawn from service in March 1985 or anticipatory action taken to stop the overhaul due to non-availability of spares and rotatables, the expenditure of Rs.6.89 lakhs on overhaul could have been largely avoided.

30. Operation and maintenance of an aircraft

Government concluded two separate contracts in May 1980 and February 1981 with the foreign manufacturers for procurement of a certain number of aircraft 'A'. These were inducted into squadron service between April 1981 and May 1983. Government also concluded a contract for the procurement of aircraft 'C' from the foreign manufacturer in September 1981. These aircraft were inducted into squadron service between May 1982 and July 1983. The trainer aircraft was common for both the aircraft 'A' and 'C' and, as such, trainers were also procured along with other items in the main contracts of May 1980 and September 1981.

Shortfall in flying efforts:- There were shortfalls against the annual authorised flying tasks. The shortfalls ranged from 17.87 to 77.97 per cent in respect of aircraft 'A', 25.37

to 80.10 per cent in respect of aircraft 'C' and 53.86 to 72.86 per cent in respect of the trainer aircraft.

Similarly, during the same period the average utilisation rate actually achieved by individual aircraft as against the monthly authorised rate of utilisation per aircraft was also low. The shortfall ranged from 15.22 to 52.89 per cent in respect of aircraft 'A', 22.45 to 78.89 per cent in respect of aircraft 'C' and 46.42 to 70.08 per cent in respect of the trainer aircraft. The shortfall in the utilisation rate of trainers would have its adverse impact on the training of pilots. Air Headquarters stated in May 1989 that the low utilisation rate of aircraft 'A' and 'C' was due to poor aircraft serviceability.

Low serviceability:- The expected serviceability percentage of aircraft 'A', 'C' and trainer aircraft, according to Air HQ was 70 per cent. Against this the percentage achieved and the percentage of aircraft on ground (AOG) during 1983 to 1988 was as under:

Year	1983	1984	1985	1986	1987	1988
Aircraft 'A' Serviceability (percent)	55.8	53.00	59.9	60.3	63.7	67.6
Aircraft on Ground (percent)	13.9	22.7	17.2	13.7	14.2	12.4
Aircraft 'C' Serviceability (percent)	65.9	56.2	63.8	63.9	70.2	51.4
Aircraft on Ground (percent)	11.4	21.6	15.9	18.1	07.00	30.01
Trainer aircraft Serviceability (percent)	54.5	60.3	54.9	55.3	47.9	50.3
Aircraft on Ground (percent)	16.7	14.1	26.8	27.6	38.4	32.4

Thus, it will be seen that while the percentage of serviceability achieved was low, the Aircraft on Ground was very high. While accepting the facts, the Air HQ stated in April 1989 that even the existing level of serviceability was achieved by resorting to heavy cannibalisation which was attributed to the present unsatisfactory level of product support.

Repair and overhaul facilities:- A protocol for setting up of repair and overhaul facilities for aircraft 'A', trainers and their engines was signed with the manufacturer in February 1981. Setting up of such facilities for aircraft 'C' and its engines was also included through a memorandum signed in March 1982 and the formal contract was concluded in December 1983. While the facilities for repair of engines were to be established at a Base Repair Depot (BRD), such facilities for the aircraft were to be established at another BRD.

Setting up of repair facilities for engines:- Though the overhaul of the engines was expected to be due by May 1984, a Detailed Project Report for setting up of the repair facilities was supplied by the manufacturer in August 1984. The civil works costing Rs.7.87 crores required for setting up of the facilities were sanctioned only in August 1986. The first phase of the project was planned to be completed by September

1987 and the second phase was planned to be completed by January 1989. The cost of the project was subsequently revised to Rs.8.67 crores in August 1987. The first phase of the project, however, could not be completed in time and was expected to be ready by September 1989.

The second phase of the project was also delayed due to non-completion of air-

conditioning, chilled water supply and external electric supply works. The civil works relating to airconditioning costing Rs.1.25 crores, considered to be critical and essential for commissioning of the project, had not commenced till December 1988. The works relating to external water supply and electric supply had also not commenced till December 1988. The probable date of completion has been extended to May 1989 and the plant was likely to be commissioned by October 1989. Non-completion of the second phase of the project had delayed the setting up of repair facilities for aggregates including repair of fuel aggregates of engines.

An expenditure of Rs.11.65 crores had been incurred on the project against plant and machinery. The expenditure incurred on the civil works up to December 1988 was Rs.3.01 crores against the sanctioned amount of Rs.8.67 crores. Though Government's approval was obtained in November 1980 for setting up the indigenous repair facilities for aircraft 'A', 'C' and their engines, the facilities had not been completed even after a lapse of over eight years. Due to delay in setting up of the indigenous repair facilities, engines and aggregates had to be sent abroad for repair and overhaul by the manufacturers during 1984 to December 1988 involving an avoidable expenditure of Rs.38.35 crores in foreign exchange.

In addition, engines due for overhaul are expected to be sent abroad for overhaul during 1989-90 at a cost of Rs.9.90 crores approximately. Further, though the repair facilities would be ready by September 1989, the IAF would not be able to undertake full fledged overhaul in the absence of group sets of spares required for overhaul of the engines. Moreover the facility being created at a cost of Rs.20.32 crores would now be utilised for the overhaul of the remaining 68.28 per cent of the total arisings.

Setting up of repair facilities for airframe:- The task for the repair of airframes for aircraft 'A' and 'C' was assigned to

another IAF Base Repair Depot in December 1981. The approval for the civil works costing Rs.6.57 crores was accorded only in December 1986. The estimated cost of the civil works was reduced to Rs.5.82 crores in June 1988. However, the progress made towards the completion of civil works till February 1989 was only 81 per cent. Anticipating delay in completion of the civil works, a contingency plan was drawn up and facilities for the overhaul of electronic, avionics and other aggregates was set up in some of the available buildings. Under the contingency plan also, the facilities were set up for only 542 types of aggregates as against a total of 888 type of aggregates. Similar contingency plan was also drawn up for undertaking the overhaul of the airframe and the facilities would be established by July 1989. Thus, due to the delay in according the approval for civil works the repair facilities for the overhaul of airframe could not be completed till March 1989 though the aircraft was inducted in March 1981.

To sum up

- Poor aircraft serviceability affected the utilisation rate and consequential flying efforts. There was considerable shortfall in the flying efforts achieved by aircraft 'A', 'C' and their trainers.
- As a result of poor planning and management, the repair and overhaul facilities for the aircraft and engines could not be established in time. It led to repair and overhaul of engines abroad during 1984 to 1988 involving an avoidable expenditure of Rs.38.35 crores. In addition, engines are scheduled to be despatched to the manufacturers during 1989-90 for repair at a cost of Rs.9.90 crores.

The matter was referred to the Ministry in July 1989, but no reply has been received (November 1989).

CHAPTER IV

NAVY

REVIEWS

31. Procurement, operation and maintenance of an aircraft

31.1 Introduction

Government approved in 1974 procurement of five aircraft from abroad for a dedicated role. Three aircraft were inducted into service in 1977 and two in 1983.

31.2 Scope of Audit

The process of selection, procurement, operation and maintenance of the aircraft were reviewed in Audit. The operation and provision of adequate maintenance support to the aircraft have also been examined.

31.3 Highlights

- The basis on which the purchase of aircraft was considered economical and the advantages in the purchase of used and overhauled aircraft could not be ascertained as the Ministry stated that the file was misplaced.
- Flying efforts and utilisation of the aircraft were affected considerably due to poor availability of the aircraft to the squadron, thereby not achieving the full flying task including training.
- There was mismatch between the induction of the aircraft and availability of maintenance and support facilities. In the absence of necessary repair facilities, overhaul of the components has to be done abroad. Such expenditure incurred so far amounts to Rs 3.34 crores.
- Repair facilities likely to be ready by March 1991 at a cost of Rs 6.13 crores will result in underutilisation as the aircraft are due for phasing out between September 1992 and January 1998.

- Additional expenditure of Rs 89.39 lakhs (approximately) had to be incurred in the deputation of foreign specialists as a result of delay in completion of civil works.

- Manhours prescribed for the scheduled maintenance of the aircraft have never been adhered to and the excess manhours utilised for each maintenance ranged from 110 to 123 percent.

- Certain systems and communication sets originally fitted in the aircraft were considered inadequate for operational role. These were replaced at a cost of Rs 3.61 crores.

- Airconditioning plants and chassis procured at a cost of Rs.38.37 lakhs were found to be technically unsuitable for operational use and had to be replaced at a cost of Rs 19.31 lakhs.

31.4 Procurement

A contract for the purchase of three aircraft and associated equipment was concluded with a foreign manufacturer in May 1976 at a cost of Rs 12.87 crores. The aircraft contracted were used and overhauled aircraft and were fitted with new engines prior to delivery. The aircraft were delivered to the Indian Navy in September 1977. The file leading to the acquisition of this aircraft were called for from the Ministry of Defence (Ministry) in July 1976 but had not been shown to audit. The basis on which the purchase of aircraft was considered economical and the advantages in the purchase of used and overhauled aircraft could not, therefore, be ascertained.

The Ministry stated in October 1989 that a file could not be furnished to Audit 'as it was misplaced' and this position was intimated to Audit in 1982.

Although the Indian Navy had a requirement of five aircraft, the manufacturer was not initially willing to release more than three. The two additional aircraft were contracted for in May 1981 at a cost of Rs 14.11 crores. These were also used and overhauled aircraft. The aircraft were delivered in January 1983.

31.5 Operation of the aircraft

The Naval air squadron for the operation of the aircraft was commissioned in October 1977. The Unit Establishment (UE) of the squadron was three aircraft. Although five aircraft were available to the squadron from January 1983, the UE was not revised except during the year 1985 to five aircraft.

There were considerable shortfalls in the availability of aircraft to the squadron even with the unrevised UE of three as given below:

Year	1981	1982	1983	1984	1985	1986	1987	1988
UE	3	3	3	3	5	3	3	3
Average availability of aircraft	1.91	1.25	3.08	3.25	3.91	3	2.08	1.83

The main reasons for this shortfall were:

- retention of the aircraft for more number of manhours than stipulated for statutory inspection and
- non-availability of the aircraft during overhaul abroad.

The shortfall in availability of the aircraft had resulted in the squadron not achieving the full flying task including training.

31.6 Repair and overhaul facilities

The contract concluded with the foreign Government in May 1976 included supply of test equipment, tools and ground equipment required for undertaking the rou-

tine maintenance and inspections on the aircraft. These equipment were received by the Naval Air Station (NAS) at station 'X' in 1977. However, the civil works required to house these equipment were completed only in March 1982 at an estimated cost of Rs 59.80 lakhs.

The question of supply of breakdown spares and equipment to undertake repair/overhaul to the components fitted on the aircraft in India was taken up with the foreign Government only in July 1977. As a result, specialists from abroad were deputed to India during October/November 1978 to study the feasibility of setting up overhaul facilities for the components in India. The team finally recommended establishment of repair facilities at NAS station 'X' as an extension of the existing base maintenance facilities. A contract was concluded for the establishment of overhaul facilities at station X for

284 components of the aircraft with the technical assistance of foreign supplier in November 1981. The project report was received from the supplier in October 1982. Further discussions were held with the specialists in February 1983 and the administrative approval for the connected civil works estimated to cost Rs 435.47 lakhs was accorded by Government only in January 1986 with probable date of completion being 270 weeks viz. by March 1991. The progress of work was only one percent as at the end of October 1989.

In the absence of necessary repair facilities, and pending setting up of repair facilities, the overhaul/repair of aircraft and its components is being done abroad. The

cost of overhaul/repairs abroad so far amounted to Rs.3.34 crores for components. The Ministry stated, in October 1989, that while concluding contracts for the repair of components it was ensured that components for which creation of facility in India was accepted were not included for repair in foreign country. All such components were held back in India for repair/overhaul by the facilities created/being created. The Ministry's argument lacks conviction since it was impracticable to hold back such components without repair from 1977 to 1988 without jeopardising the operational efficiency of the aircraft.

The total service life (provisional) of the aircraft is 10,000 hours or 15 years of operation. Therefore, three of the aircraft would be due for phasing out in September 1992 and two in January 1998. Thus the repair/overhaul facilities likely to be commissioned by March 1991 at a cost of Rs 6.13 crores will result in underutilisation. The Ministry stated in October 1989 that a proposal to extend the life of the aircraft was in hand. The Ministry also stated that the facility was being augmented to facilitate repair and overhaul of 252 components of another newly acquired aircraft and helicopter.

31.7 Deputation of foreign specialists

In January 1985 the foreign Government proposed an agreement to be signed for deputing their specialists to India for rendering technical assistance in the erection and commissioning of repair facilities. The cost of their stay was estimated at Rs 82.61 lakhs. The proposal was cleared by the Ministry in May 1985. In view of the fact that the civil works for the repair facilities were then expected to be completed only by end of 1987/early 1988, the agreement was signed only in March 1988. The present cost is estimated to be Rs.1.72 crores. Thus the additional expenditure of Rs 89.39 lakhs (approximate) is directly attributable to the delay in completion of civil works.

31.8 Maintenance of aircraft

The type of maintenance and man-hours required for each type of scheduled maintenance of the aircraft prescribed by the foreign supplier have not been observed by the Indian Navy. Further the manhours laid down for each maintenance have never been adhered to and the excess manhours utilised for each maintenance ranged from 110 to 123 percent. The Ministry stated in October 1989 that the man hours laid down by the manufacturer for each maintenance are not in totality applicable in Indian conditions and the average physical strength of skilled and unskilled personnel. The contention of the Ministry is not tenable as there are no laid down norms to compare the physical strength of skilled and unskilled Indian workers vis-a-vis those of the foreign manufacturer.

The manufacturer of the aircraft had recommended service life for the airframe and engines with reference to flying hours achieved or the years of operation. A scrutiny of the overhauling of the air frames/engines revealed that none of the airframes/engines sent for overhaul had completed the prescribed engine hours before it fell due for overhaul. Some spare engines having engine hours from 0 to 36 percent were sent for overhaul due to expiry of their calendar life.

31.9 Electronic support measure

The five aircraft, when purchased from abroad were not provided with a specific capability except a rudimentary radar warning system which had no potential to the dedicated role of the aircraft. This shortcoming was viewed as a serious operational limitation. The Defence Research and Development Organisation had estimated Rs 9 to 10 crores per system for its indigenous development. In view of the high cost and anticipated delay involved in development of an indigenous system, it was decided to transfer one system from the supplies meant for another aircraft on an experimental ba-

sis. It was also decided that on completion of successful trial and evaluation, the requirement for the other four aircraft would be considered. The installation of the system was to cost Rs. 1.49 crores in foreign exchange. The imported ESM system was fitted on one of the aircraft in January 1987. During trials, the aircraft sustained extensive damage while landing. The cause of the accident was investigated by a Board of officers during June 1987 and the Board attributed the damage to the aircraft "primarily to fatigue failure of the under carriage etc which fractured under landing circumstances". In view of the damage to the aircraft the ESM system was shifted to another aircraft at an estimated cost of Rs 7.15 lakhs during May 1988. The results of the trials were found to be useful. However, the Naval authorities wanted certain improvements to be carried out to the system before the system was fitted on other aircraft. A final decision on the fitment of the system on other aircraft was yet to be taken. The Ministry, stated in October 1989 that the full trials were not yet complete.

31.10 Communication system

The aircraft were fitted with a communication set which were considered inadequate for the operational role. This set had already outlived its life at the time of delivery of the aircraft. Sanction was therefore, obtained in March 1987 for the replacement of the set with an indigenously developed set by HAL at an estimated cost of Rs. 89 lakhs. The first set was supplied by HAL in April 1987 and the same was installed in one of the aircraft. The set was subjected to ground and flight trials and the set was found to be not satisfactory. The Ministry stated in October 1989 that HAL was expedited to improve the performance and modification kit was still awaited for aircraft modification. (Reply of Ministry against sentence 96 and 97 refers)

31.11 Airconditioning system

Under two contracts concluded with the manufacturer in May 1976 and August 1979, three airfield multi purpose airconditioners with chassis were contracted for at an estimated cost of Rs.38.36 lakhs. The plants were received at station 'X' in October 1977 (two sets) and July 1980 (one set). These plants were meant for cooling the computer compartment and cabin of the aircraft when the aircraft was on the ground.

An examination of the utilisation of these plants revealed that it was technically unsuitable due to its complex nature and due to logistic problems. Even when these plants were put to use, their capacity for cooling the computer compartment was not adequate to maintain the desired temperature. The use of the equipment was therefore, restricted and its utilisation so far was only 304 hours, 1049 hours and 103 hours respectively in respect of plants I to III. The chassis of these airconditioners have run 3037 kms, 4708 kms and 865 kms respectively. These plants became unserviceable from 1984 onwards. A Board of officers assembled in July 1987 recommended the boxing up of airconditioning plants and disposal of vehicles by public auction.

In view of the unsuitability of the airconditioning plants procured from abroad, sanction was accorded by the Ministry in September 1980 for import of two 108 tonne capacity airconditioning (AC) units and for purchase of chassis for Rs 20 lakhs. The AC plants and the chassis, procured in January/February 1982 at a cost of Rs.19.31 lakhs, were commissioned in August 1982.

31.12 Identification friend or foe system

The identification friend or foe (IFF) is used by ships/aircraft in identification of approaching contacts on radar. This system is necessary for positive identification of friendly/enemy contacts and thereby preventing mistaken identity attacks. The IFF

system supplied by the manufacturer along with the aircraft was not compatible with the ship borne interrogator. Therefore, Ministry's sanction was obtained in February 1984 for the procurement of five indigenous IFF systems with test equipment, spares etc. at a cost of Rs 28 lakhs. These equipment were installed on the aircraft between January 1984 and January 1987.

31.13 Navigation system

The aircraft were fitted with a navigation system which had low reliability. Sanction was therefore, obtained in September 1984 for the import of navigation system, even though the system was indigenously available with the HAL whose delivery schedule was not favourable to Navy due to urgent requirement. As HAL had agreed to reduce the lead time the import sanction was cancelled and a fresh sanction was issued in February 1986 for the procurement of six navigational system at an estimated cost of Rs 87.40 lakhs. The equipment were supplied and the same installed on all the aircraft between June and November 1986.

31.14 Aircraft accidents/ incidents

Out of 140 accidents/incidents in respect of the aircraft during the period from 1978 to 1988, 77 were attributed to material failure/ malfunctioning.

32. Induction of SSK submarines

32.1 Introduction

The Ministry sanctioned in March 1982, the SSK submarine project at a total cost not exceeding Rs.509 crores including Rs.404 crores in foreign exchange (FE) at November 1981 price level. The project included acquisition from a foreign country of two submarines, two material packages for indigenous construction of the submarines at Mazagon Dock Ltd.(MDL), purchase of torpedoes, setting up of a training school, base and repair facilities and creation of infrastructure at MDL.

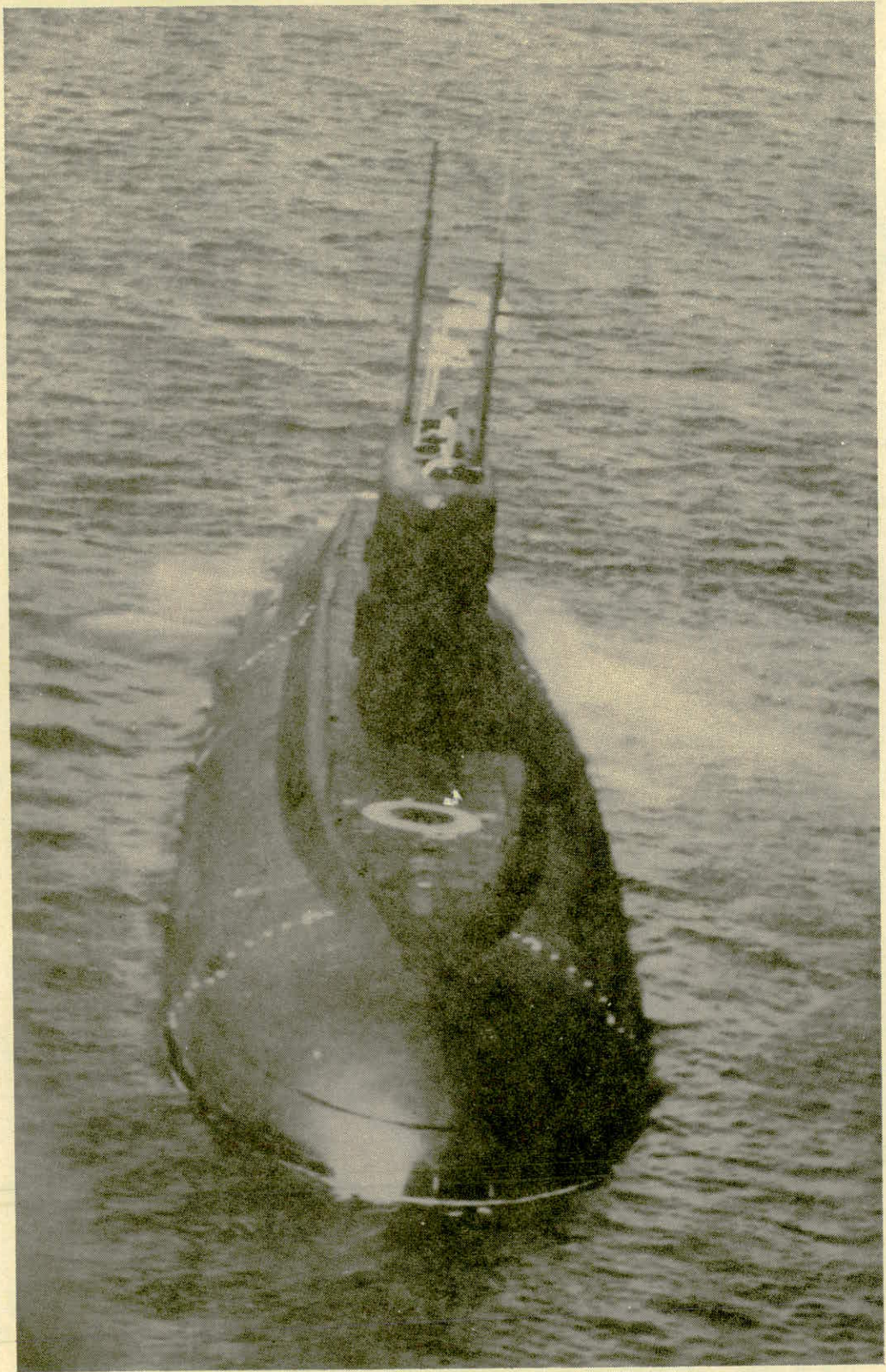
32.2 Scope of Audit

During 1987, a study was made by Audit on the acquisition of two submarines, two material packages and torpedoes. This was commented upon vide para 55 of the Report of the Comptroller and Auditor General of India for the year ended 31 March 1987.

The position relating to the indigenous construction by MDL of two submarines, utilisation of infrastructure created at MDL, setting up of base and operating facilities, training facilities and repair facilities has been reviewed in this report. Additionally, the planning aspects relating to connected activities were looked into.

32.3 Highlights

- **The time required for construction of the submarine at MDL was grossly underestimated. It had to be increased from 42 months to 81 months leading to time and cost overruns in the project. The cost of the indigenously built submarines is now estimated at Rs.334.06 crores as against Rs.196.91 crores initially. In contrast, Government have paid Rs.172.48 crores for the two sailaway submarines contracted in November 1981. Also, there was a significant industrialisation of the shipyard effort involved in indigenous construction. Originally estimated at Rs.63 crores, this effort is now estimated to cost Rs.152 crores.**
- **Due to delay on the part of the Ministry to take a decision about the future construction plan, the facilities created at MDL at a cost of Rs.44.7 crores are under-utilised. Machinery costing Rs.12.69 crores would remain idle after completion of the two submarines.**
- **There was a mismatch between the induction of submarines and the**



SSK Submarine

commissioning of related training simulators and non-availability of certain essential training equipment.

- **A number of items of work on the submarine could not be attended to either for want of spares or due to delays in creating the facilities required.**
- **An incorrect assessment of spares at the contract finalisation stage resulted in the procurement of Base and Depot spares at a higher cost of Rs.91 crores against adhoc provision of Rs.32 crores.**
- **There was a mismatch between the receipt of ammunition and creation of facilities for their storage, repair and preparation. The infrastructural facilities for the mines had not been provided.**

32.4 Indigenous construction of two submarines by MDL

The contract to acquire building technology including know-how for planning and preparing MDL for construction, testing, trials and commissioning of the submarines and to purchase two material packages at a cost of Rs.83.6 crores at February 1979 price level subject to escalation was signed in December 1981 with a foreign firm 'A'. The construction of the vessels with these material packages was expected to be completed in 1987 and 1988.

Two workshops for construction of the submarines at MDL were completed in March 1984 and other ancillary services were ready only in September 1984. The actual cost of creating these facilities was Rs.41.80 crores (March 1989). The construction of the first submarine commenced in January 1984 and the second in September 1984. The construction schedule of two submarines was 42 months as recommended by firm 'A' and accepted by MDL. This schedule was, however, revised to 81 months in June 1986 and based on this revised sched-

ule, the submarines are now expected to be completed in 1990 and 1991. According to the Ministry, the revision of the construction schedule and resultant delay in the delivery of the submarines were on account of the delay in creation of facilities at MDL, inadequacies in the training imparted to MDL personnel by firm 'A', supply of a large number of semi-finished items by firm 'A' which had to be processed further indigenously at an additional expenditure of Rs.62.86 lakhs etc. Additionally an amount of Rs.4.10 lakhs was spent for reordering of material packages damaged during storage by MDL in the monsoon.

Due to the delay in construction of the submarines in MDL, the warranty period of the items supplied by firm 'A' expired. When the matter was taken with firm 'A', the firm argued that it supplied the items in the same fashion that it received in its shipyards. It was seen in audit, that the clauses of contract for such supply of items were not spelt out in unambiguous terms. The Ministry stated in October 1989 that the issue of claiming damages from firm 'A' on account of the supply of semi-finished items was under consideration. The services of the specialists and representatives of firm 'A' had to be extended by 162 and 36 man months at a cost of Rs.7.53 crores. The cost of services of sub-contractors' specialists also increased from Rs.5.3 crores to Rs.6.02 crores.

The final cost of the two submarines built by MDL is estimated at Rs.334.06 crores whereas the cost of two ready built submarines acquired from firm 'A' was Rs.172.48 crores only. The estimated cost of yard effort included in the total cost of the indigenous submarines was Rs.152 crores against Rs.63 crores estimated initially. The reasons for the increase in cost of the indigenous submarines were attributed to the revision in the construction schedule from the original 42 months to 81 months, increase in labour cost and labour overheads, amortisation of cost over two instead of four

as originally envisaged, the fall in ratio of rupee etc..

32.5 Utilisation of the infrastructure at MDL

The project envisaged construction of workshops, buildings and dry dock in MDL including augmentation of the existing facilities.

The estimated cost of these facilities was Rs.41.99 crores to be completed by January 1984. The facilities were actually completed by September 1984 at a cost of Rs.41.80 crores. Since an order for construction of further submarines had not been placed on MDL, the facilities created at MDL would remain idle after the completion of the construction of the two submarines. Dedicated welding equipment etc. of the value of Rs.12.69 crores would remain idle after completion of the two submarines. The unamortised cost of the project after the completion of the construction of the two submarines would be Rs.27.33 crores. Besides, specialised training and skills developed by MDL in submarine construction would be rendered surplus.

32.6 Setting up of base and operating facilities

32.6.1 Construction of base complex

For the efficient functioning of the base and squadron staff when in harbour, construction of a permanent base complex of a total floor area of 6156 square metres for Rs.3.23 crores was sanctioned by the Ministry in January 1986. The complex was completed in August 1987. The accommodation provided for the base complex is in excess of needs and remains underutilised. The Ministry stated in October 1989 that since the two indigenously built submarines were yet to join the fleet, full complement was not positioned.

32.6.2 Procurement of mobile equipment

Mobile equipment such as high pressure air compressor, chilled water aircondi-

tioning plants, oxygen breathing air and breathing gas charging set, battery charging set, tractor, transformer and switch gear, essentially required for the operation of the submarines were procured during February 1986 to January 1988, against a sanction issued by the Ministry in January 1985 at a cost of Rs.1.97 crores. An examination of the utilisation of these mobile equipment revealed that four high pressure air compressors imported in February 1987 at a cost of Rs.40 lakhs for the exclusive use of the SSK submarines are being constantly used for other types of submarines due to their low utility for SSK submarines.

32.7 Training facilities

In order to impart basic training to the operators and in the maintenance of the SSK submarine, equipment worth Rs.4.75 crores was considered necessary. A decision on the equipment required had not been taken till October 1989.

The Ministry stated in October 1989 that due to paucity of funds, the decision on the procurement of training aids was being reviewed by Naval HQ.

The requirement of two types of training simulators 'M' and 'N' for the submarine was projected by Naval HQ in November 1982 and approved by the Ministry in September 1983. Simulator 'M' was required for the combat training of submarine crew in the submarine control system, as imparting of such training on the submarine is expensive and risky. Although the procurement of simulator was approved in September 1983, the contract for its procurement at a cost of Rs.4.95 crores was concluded with a foreign firm 'D' only in March 1985 as firm 'A', the supplier of the submarine had initially refused to part with certain vital information to firm 'D' for manufacturing the simulator. Firm 'D' could supply the simulator only in April 1988 against the scheduled delivery date of May 1987. Liquidated damages amounting to Rs.40 lakhs had been recovered from the firm for the de-

layed delivery. Naval HQ stated in April 1988 that due to the delay in receipt of the simulator, the submarine crew were trained on board the vessels. This was not considered safe for the submarine by the Naval HQ. The Ministry, however, stated in October 1989 that the training could be imparted at sea without any risk by a worked-up crew.

The fire control system of the submarine is a highly advanced system. The proposal of Naval HQ for the procurement of simulator 'N' for training purpose was approved by the Ministry in September 1983. Two contracts were concluded with a foreign firm 'E' in December 1984 for the procurement and installation of the simulator at a total cost of Rs.7.60 crores. The simulator was accepted in March 1987 and installed in June 1987.

Due to delay in placing orders after obtaining quotations in 1982, the firm had increased the cost of the simulator by Rs.42 lakhs. The Ministry also stated that the delay in conclusion of contract for simulator 'N' was on account of the time taken for scrutinising the specifications and the increase in cost was mainly due to variation in exchange rate and a percentage of normal escalation.

32.8 Repair facilities

Repairs in respect of the submarines and the various equipment that they carry were required to be undertaken at various intervals of time. The operation-cum-refit cycle warrants a short refit after every 12 months for a duration of two months. Accordingly, the first and second short refit of the first submarine fell due in September 1987 and November 1988 and that of the second submarine in November 1987 and January 1989. The short refit of first submarine commenced in September 1987 and was completed in November 1987 and the second refit has not been done so far (February 1989). The short refit of the second submarine commenced in May 1988 and

was completed in July 1988. During the short refit of both the submarines a number of items of work could not be carried out either for want of spares or non-availability of facility. According to Naval authorities the non-completion of certain items of work might be detrimental to the material state of the submarine and on-board equipment. The Ministry stated in October 1989 that the operation-cum-refit cycle was revised in January 1988 in view of the satisfactory material state of the submarine and the operational time had been decided as flexible from 15 to 18 months. The Ministry also stated that second short refit of the first submarine was completed in July 1989 and all the critical items of work had been completed. However, routine repairs of certain equipment were outstanding due to nonavailability of tools and spares and facilities.

32.9 Guarantee defects

A major failure report which has not been accepted by the firm 'A' as guarantee defect relates to cracks in the flange sealing and consequent damage to the two life rafts of the submarines. The life rafts were despatched to firm 'A' in November 1987 for defect investigation and repair under warranty. Firm 'A' stated after investigation that the damage was due to violent external forces and was, therefore, not covered by warranty but offered to repair it at a cost of Rs.7.85 lakhs besides Rs.0.66 lakh for investigation. The Ministry stated in October 1989 that detailed discussions with the representatives of the firm had been held in August 1989 and it was still under negotiations.

32.10 Base and Depot spares

During the finalisation of the contract for the acquisition of the submarine and material packages, firm 'A' did not give a specific quotation for the Base and Depot (B and D) spares as per Indian Navy's spares philosophy. It was therefore, decided by the Ministry in November 1981 not to in-

clude supply of spares in the contract but to procure them separately on a commitment from firm 'A' that it would supply the spares at a fair and reasonable cost. Therefore, an adhoc provision of Rs.32 crores was made. However, there was a delay in progressing the orders for B and D spares. Since Naval HQ did not have enough experience in making out the list of spares required on their own it had to depend upon firm 'A' in the beginning. Firm 'A' was to supply the list of spares by December 1983, but supplied a 90 per cent complete list only by the last quarter of 1983. It was found that firm 'A' was over-charging by a considerable amount and Naval HQ decided to make the entire list on their own for which purpose a Naval team was sent abroad for a period of six months in order to obtain the prices directly from the vendors. On receipt of the recommendations of the committee, a detailed technical documentation was prepared and orders were placed on selected suppliers. The estimated cost of B&D spares had, however, gone upto Rs.91 crores as against Rs.32 crores provided initially. The Ministry stated in October 1989 that the increase in cost was on account of price escalation, increase in the quantity of spares and adverse exchange rate variations.

32.11 Procurement of ammunition

32.11.1 Torpedoes

In December 1981 a contract was concluded with a foreign firm 'F' for the procurement of a certain number of torpedoes at a cost of Rs.50.57 crores. These were accepted at the firm's premises after trials, between October 1985 and April 1987. The torpedoes had a warranty of 19 months from the date of acceptance.

The storage, repair and preparation of these torpedoes were the responsibility of a Naval Armament Depot (NAD), at station 'X'. Though all the torpedoes contracted were accepted between October 1985 and April 1987, they were received in the NAD only between March 1986 and February 1988. A major portion of the warranty period of the torpedoes expired by the time they

were received in the NAD.

There was a mismatch between the receipt of the torpedoes and the creation of facilities for their storage, repair and preparation. Interim arrangements were, therefore, made for the maintenance and testing of the torpedoes. Two torpedoes became unserviceable due to their slipping forward from the tubes. They could be made serviceable by replacing a part costing approximately Rs.36 lakhs. The Ministry stated in October 1989 that the permanent storage facility was completed in January 1989 and the equipment and other services were shifted to the new complex. On testing, 17 torpedoes were found in a repairable state and the Ministry stated that they were under repair, free of cost, by the manufacturer.

32.11.2 Mines

Two mine saddles for carrying mines were procured alongwith the two submarines at a cost of Rs.5.87 crores from firm 'A' for use by four submarines. Naval HQ evaluated several mines and short-listed two foreign firms G and H. Their offers for the supply of mines were Rs.5.6 crores and Rs.7.36 crores respectively. Naval HQ had earlier, in 1981 and 1984, procured exercise mines of the firm 'H' and at that time they had intentions to procure the live mines from this firm. Although the exercise mines did not prove satisfactory, the Ministry concluded a contract in June 1986 for the procurement of live mines from firm 'H'.

The mines from firm 'H' were received by another NAD at station 'X' in November 1987. The infra-structure facilities for the storage and maintenance in the NAD have not so far been provided. The Ministry stated in October 1989 that the facilities are likely to be completed by December 1989.

33. Crash local purchase of stores by a project team

33.1 Introduction

The Controllorate of Procurement (CPRO), Bombay, formed a Project Team in Bombay, in September 1980 in order to accelerate the procurement of stores and to liquidate over 45,000 pending demands.

33.2 Scope of Audit

A review was carried out in June-July 1986 on the working of the Project Team (Team) and the procedures adopted for the procurement of stores worth Rs.7 crores approximately. The review by Audit could not be carried out earlier for want of necessary documents which were with the Central Bureau of Investigation. The role of internal audit and the adequacy of measures taken to prevent the recurrence of such cases were also examined.

33.3 Highlights

- **The review revealed that the Team paid scant regard to the laid down principles of local purchase and the powers vested in them. It either did not maintain proper records or manipulated them and favoured certain suppliers. In the purchase of stores worth Rs.98.89 lakhs an avoidable expenditure of Rs.47.06 lakhs was revealed.**
- **No assessment was made by either Naval HQ or the Ministry of Defence of the extent to which the Team's objectives had been met and at what cost. Also, no orders were issued to ensure that such cases do not recur.**
- **The role of Controller of Defence Accounts (Navy) in making the payments by neglecting some of the glaring irregularities committed by the Team while making the purchases was also questionable.**

33.4 Responsibility of the Project Team

The Team's responsibility was specifically restricted to each item costing less than Rs.500 and to items for which not more than four demands were pending. The Team was given further powers by the Material Superintendent (MS), Bombay, in September 1980, to issue tender enquiries to approved vendors, prepare comparative statements of tenders, accept tenders, place sup-

ply orders, inspect stores tendered by the suppliers and process bills with the Controller of Defence Accounts (Navy) (CDA(N)). This was in contravention of Government orders which prohibited the vesting of powers of procurement and inspection simultaneously in the same agency, in this case the Team.

33.5 Procurement procedure

A scrutiny of the procurement procedure followed by the Team revealed violation of orders and procedures and other irregularities resulting in loss to Government. Some of the cases noticed are indicated in the succeeding paragraphs.

33.5.1 Irregularities in the selection of suppliers

As a rule, purchases are to be made by the material organisation from amongst registered suppliers. While the CPRO has a large number of firms borne on their approved list of suppliers, the Team chose to place 36.40 per cent orders worth Rs.2.75 crores on 15 firms, none of which was on the approved list.

33.5.2 Irregularities in the issue of tender enquiries, receipt of quotation and placement of orders

(a) As per orders of Government, quotations are to be invited from a minimum of seven firms for orders up to Rs.10,000 and 15 firms for orders above Rs.10,000 but up to Rs.50,000. This requirement was not complied with by the Team in 50 cases test checked for purchases worth Rs.6.38 lakhs.

(b) Tender enquiries were not issued by post nor was any proper record, aimed at ensuring that the enquiries in fact reached the suppliers, maintained. The procedure followed in the issue of tender enquiries and the receipt of quotations in response thereof raised doubts on the genuineness of enquiries and quotations.

In many cases, the quotations were not on the prescribed form but were on firms' letter heads. The firms did not return the prescribed form along with their quotations. In a few cases test checked, it was noticed that though these were different quotations, the addresses were the same. In 27 enquiries the quotations on record did not bear the signature of the firm's representative who reportedly furnished the quotations.

A review of 250 tender enquiries from October 1980 to January 1981 revealed that 91 per cent of the enquiries were issued without specifying the date and time for the receipt and opening of quotations and also without indicating the specific date by which the supplies were required instead, these were indicated as "immediate".

A check of 50 cases pertaining to the period from October to December 1980, indicated that in 48, supplies worth Rs.6.36 lakhs had materialised before the placement of local purchase orders (LPOs). These included 21 cases involving items worth Rs.2.99 lakhs where even comparative statements of tenders had not been prepared.

In 25 cases checked, the dates of quotations appeared to have been altered apparently to match with the date of placement of supply orders.

There is, therefore, evidence to suggest that in most cases the suppliers were selected and stores obtained first and the formalities of receipt of quotations and placement of orders were completed thereafter.

33.5.3 Splitting up of requirement

The Team was specifically asked to procure only such items as were costing less than Rs.500 and for which up to four demands were pending. 325 repeat orders for the purchase of seven items valuing Rs.47.63 lakhs were issued between October 1980 and March 1981 where the value of each of such orders exceeded Rs.500.

Though the procurement of steel plates was not within the purview of the Team, yet the Team placed 216 orders for

the supply of 23 items of steel plates at a cost of Rs.25.48 lakhs from local unregistered firms.

33.5.4 Unauthorised/unnecessary procurement

The Team, as per the orders of September 1980, was not to procure any item for which either no demand was pending or for which more than four were pending. A test check of the orders placed revealed the following :

(i) A scrutiny of 100 LPOs valued at Rs.12.77 lakhs, revealed that no demand/authority was quoted.

(ii) In respect of 303 orders for machinery and spares, the requisition slips quoted as authority were not found on record. In respect of 50 such cases seen by Audit, the value of stores was Rs.14.65 lakhs. Figures in the slips were also found to have been altered/tampered with in the purchase of stores worth Rs.3.97 lakhs in 12 cases.

(iii) In 20 cases seen in Audit, two to nine orders were placed against one indent and in a majority of such purchases, items were still held in stock.

(iv) In respect of some items procured by the Team there were no issue at all.

1304 boiler tubes worth Rs.2.86 lakhs conforming to four different pattern numbers were procured during October to December 1980 by the Team through 21 purchase orders when there was adequate stock. These tubes were being imported and continue to be imported as no indigenous source of supply existed. The items procured by the Team were found to be unsuitable and consequently an endorsement was made on the bin card that "Boiler Tubes purchased through the Crash Local Purchase orders were not to be issued". Except for 567 items issued to a training establishment during July 1985 i.e. after almost five years of purchase, the balance quantity worth Rs.1.53 lakhs procured through crash local purchase remained in stock in addition to imported stocks (July 1986).

33.5.5 Extra expenditure due to exorbitant cost of procurement

The Team had followed a procedure whereby any competition in quoting rates was eliminated. Efforts were, therefore, made to ascertain the reasonableness of the rates by comparing the cost of procurement by the Team with the rates at which the same items were procured by the CPRO which is the normal procurement agency. The examination revealed that the cost of procurement by the Team was exorbitant and in a few instances it was up to 12 times the cost of procurement of the same item by the CPRO.

A review of 539 purchase orders comprising approximately ten per cent of the total orders issued by the Team revealed that a sum of Rs.34.98 lakhs was paid in excess in the purchase of naval stores worth Rs.80.34 lakhs as compared to the purchases made by the CPRO during the same or subsequent period. Similarly, in the purchase of machinery and spares worth Rs.18.55 lakhs excess expenditure of Rs.12.08 lakhs was incurred.

33.5.6 Non-compliance of orders of the Admiral Superintendent Dockyard

In February 1981, the Naval Dockyard, Bombay issued orders for examining the purchases by the Team that appeared to be at exorbitant rates, to ascertain whether or not there were any malafides in the transactions. On 25th March 1981 orders of the Admiral Superintendent for cessation of further purchases by the Team were issued. Despite the orders of disbandment issued by Material Superintendent on 3rd June 1981, the Team continued with its activities and orders were placed even on 4th June 1981. At the time of disbandment of the Team, supplies received against 84 orders were pending inspection and acceptance. Out of these, items supplied against nine purchase orders were rejected and items supplied against another eight could not be located (April 1989). The value of items which

were rejected and those which could not be located were called for but not furnished by the Ministry.

33.5.7 Maintenance of incomplete records

The Local Purchase Order Register produced to Audit indicated that between September 1980 and June 1981, 5664 LPOs were placed by the Team whereas the CPRO/MS intimated that the number of supply orders was 5469. However, only 5069 LPOs, including 378 cancelled LPOs were produced to Audit. The discrepancy in the actual number of LPOs placed by the Team was yet to be reconciled (July 1989).

An analysis by Audit of all the LPOs in respect of machinery and spares indicated that out of a total of 510 orders placed, seven orders were not produced to Audit and 21 orders which were not listed in the register of LPOs were amongst those produced for audit. It was also seen from receiving slips that six LPOs were placed which were neither noted in the LPO Register nor produced to Audit.

33.6 Role of CDA (N)

All bills for purchases made by the CPRO as also by the Team were pre-audited and passed by the CDA (N). The irregularities committed by the Team were too obvious to have escaped notice while scrutinising the orders and passing the bills.

33.7 Investigation by the Central Bureau of Investigation (CBI)

At the instance of Naval HQ, the CBI had examined 750 supply orders and five cases were registered against the officers and suppliers concerned. The CBI indicted the then MS, Controller of Technical Services (CTS), officer-in-charge CLP cells, in all five cases.

Also, the then Project Officer of the Team was indicted in four cases and the latter CTS was found guilty in one case. The CBI had recommended administrative action against all the officers. The Naval HQ stated in February 1985 that the latter

CTS was prematurely released with effect from 30th October 1984 and the other officers incurred severe displeasure of the Chief of the Naval Staff on 23rd December 1983. It was, however, seen that the officer was released from service at his own request and not on account of any disciplinary action. Also, there was no review of the case within Naval HQ or the Ministry of Defence to assess the extent to which the objectives of the Team had been met and at what cost. Equally, there has been no issue of instruction to prevent the recurrence of cases of this type.

The matter was reported to the Ministry of Defence in June 1989; no reply had been received (November 1989).

34. Sanctions for works services

34.1 Introduction

The sanctioning and execution of works services required for the Armed Forces are regulated by rules laid down in the Regulations for the Military Engineer Services (RMES), Revised Works Procedure (RWP) - effective between April 1969 and March 1986 and the Defence Works Procedure (DWP) - April 1986. For purpose of administrative and technical control, the works are divided primarily into 'original works' and 'repairs'. There are four stages before an original work is executed viz. acceptance of necessity, administrative approval (AA), appropriation of funds and technical sanction. Any Commander may, however, order commencement of works on operational military necessity or on urgent medical grounds under para 11 of the RWP by short circuiting the normal procedure to be followed by the issue of an administrative approval.

Defence works are categorised as 'authorised works' comprising works services authorised in the Regulations or in separate orders of a general or specific nature and customary to be provided for troops as per laid down scales and 'special works' comprising works services not falling within

the scope of 'authorised works' and sanctioned only under exceptional circumstances and which would not introduce a new practice or change of scale.

While Government exercises full powers for sanctioning of works, the Service Headquarters (HQ) and authorities subordinate to them have been delegated financial powers for sanction of works under orders issued from time to time. The sanctions issued by the authorities lower than Government of India, are audited by the Internal Audit Organisation and consequential irregularities are required to be pursued to logical conclusion.

34.2 Scope of Audit

The review records the results of a test check of the sanctions accorded between 1981-82 and 1986-87 by the Chief of the Naval Staff, Naval Command Headquarters (HQ) and subordinate authorities.

34.3 Highlights

The review brings out :

- **Works services costing Rs.33 crores which required the sanction of higher authorities were split up and sanctioned piece-meal to bring the value of sanction within the financial powers of lower authorities.**
- **Certain works services which were specifically prohibited were sanctioned in disregard of Government orders.**
- **Works costing Rs.0.65 crore which were not sanctioned in accordance with the regulations and orders were subsequently cancelled at the instance of Audit.**
- **There is considerable evidence of non-observance of regulations, orders and instructions by Naval authorities while sanctioning various works. Such a situation would warrant a review of the existing system to enforce the delegation of**

financial powers more effectively, possibly through internal audit, to ensure that financial discipline is maintained.

34.4 Splitting up of works

Regulations provide that where a number of services in a station or area are necessitated by a change of plan or policy or location of units or portion thereof, all such works have to be considered as one project and sanctioned by the appropriate competent financial authority (CFA) in the order of urgency of construction and no project will be split up merely to bring it within the financial powers of sanction of the lower CFA. A recce-cum-siting-cum-costing board (Board) is generally convened to give a broad outline of the works services required at a particular point of time and rough indication of cost. Its findings form the basis of determining the CFA for sanction. However, cases of splitting up of works or of reducing requirements to bring these within the delegated powers of lower CFA were noticed which are discussed below :

34.4.1 Works services for helicopter base, hangar and work-shop facilities:

(a) A sanction was issued by HQ Western Naval Command (WNC) in December 1985 for Rs.69.24 lakhs for augmentation of flying facilities as operational requirements at a naval base. Five more sanctions aggregating Rs. 214.19 lakhs were also issued for connected works services at the base between January and November 1986. Thus works services costing Rs.283.43 lakhs requiring Government sanction were approved by HQ WNC.

(b) Between September 1981 and January 1983 four sanctions amounting to Rs.158.64 lakhs were accorded by HQ Eastern Naval command (ENC) for providing hangars and repair facilities for aircraft at Visakhapatnam.

(c) In addition to Naval HQ sanction of November 1985 for the construction of a

hangar at Cochin at a cost of Rs.72.27 lakhs, additions and alterations at a cost of Rs.49.50 lakhs were sanctioned by HQ Southern Naval Command (SNC) in February 1986 though the requirement was essential and assessable in November 1985 itself.

(d) Three sanctions were issued between March and May 1987 worth Rs.201.23 lakhs for creating hangar facilities at Goa by HQ SNC.

34.4.2 Single accommodation for probationary nurses: In March 1983, Government while sanctioning a probationary nurses training school at Cochin, stipulated that accommodation for the school and living accommodation for the trainees would be found from within the existing buildings of the Indian Navy Hospital Ship (INHS) Sanjivani. However, HQ SNC convened two boards in June 1984 for providing living accommodation and based on the recommendations of one of the board's it accorded sanction in October 1984 for the construction of a mess at an estimated cost of Rs.29.82 lakhs for the probationary nurses. Sanction for the construction of the single accommodation for nurses at a cost of Rs.51.59 lakhs was also accorded in December 1984 by Naval HQ. Thus, apart from splitting up the work, construction of accommodation was sanctioned in contravention of Government's specific stipulation in this case.

34.4.3 Married accommodation for officers and sailors:

(a) In March 1984, Naval HQ accorded two administrative approvals amounting to Rs.146.75 lakhs for the construction of quarters for officers at Ghatkopar. Since the amount of these administrative approvals was beyond the financial powers of Naval HQ, this was objected to by Audit in July 1984. Resultantly Naval HQ instructed the Zonal Chief Engineer in October 1985 to prepare a combined estimate for further processing. The final outcome was awaited.

- (b) Similarly, in March 1985, HQ WNC sanctioned two works for the construction of married accommodation for sailors, one at a cost of Rs.45.60 lakhs and the other at Rs.43.02 lakhs. The combined value of the sanctions viz 88.62 lakhs exceeded the financial powers vested in the Flag Officer Commanding-in-Chief, WNC.
- (c) INS India is the base for all naval personnel posted at Naval HQ and is responsible for all administrative support including the provision of accommodation. Naval HQ accorded two sanctions in November and December 1985 for the construction of accommodation for 48 married sailors each at an estimated cost of Rs.50.24 lakhs and Rs.49.79 lakhs respectively which were revised in June 1987 to Rs.58.57 and Rs.56.95 lakhs respectively. Meanwhile, another sanction was accorded in October 1986 for the development of land and integrated external services for the same residential complex at an estimated cost of Rs.29.76 lakhs, subsequently revised to Rs.36.04 lakhs in December 1987. Thus, three different sanctions aggregating Rs.1.52 crores against the limit of delegated powers of Rs.80 lakhs were issued by Naval HQ for providing accommodation to one establishment.
- (d) In March 1984 five sanctions covering an expenditure of Rs.3.82 crores in June 1984, another five sanctions for Rs.3.94 crores and in March 1985 seven sanctions aggregating Rs.4.98 crores were issued by NHQ for the construction of married accommodation for sailors at Cochin. Thus the total value of the work sanctioned for the same establishment was beyond the financial powers of Naval HQ and resulted in splitting up of works worth Rs.12.74 crores which required Government sanction.

34.4.4 Single accommodation for sailors:-

- (a) In May 1982, a deficiency of single accommodation for sailors at Indian Naval Ship (INS) Venduruthy at a rough cost of Rs.1.73 crores was worked out by a Board against which a sanction was accorded by Naval HQ in September 1982 for the construction of single accommodation for Rs.79.98 lakhs. Another Board was held in June 1983 which again assessed the shortage at INS Venduruthy against which a sanction was accorded by Naval HQ in September 1983 for the construction of single accommodation for Rs.59.91 lakhs. As the connected external services were not included in these two sanctions, a further sanction was accorded in September 1985 for Rs.14.55 lakhs by HQ SNC. Thus, works costing Rs.1.54 crores were split up and sanctioned by Naval HQ and the command HQ instead of by the Government.
- (b) In September 1984, a Board recommended the construction of single accommodation for sailors for INS Valsura. An administrative approval was accorded in November 1985 by HQ WNC for the construction of accommodation for Rs.42.50 lakhs. Another administrative approval was accorded by HQ WNC in September 1986 for the construction of single accommodation for sailors at an estimated cost of Rs.39.76 lakhs. The two sanctions were obviously issued separately to avoid a reference to the higher authority.

34.4.5 Provision of Storehouse:

Between March 1984 and December 1986 Naval HQ issued six sanctions and HQ ENC issued one sanction for the construction of store house at Visakhapatnam for Rs.5.22 crores. Naval HQ justified the splitting up on the ground that store houses had

to be provided separately for various categories of stores of different sizes, specifications and class of ships and the works were included in the works programme and were also budgeted for. The contention of Naval HQ defy any rationale and run counter to the spirit of the Regulations and orders. If storage requirements had been adequately anticipated and planned for, a comprehensive project could have been developed which would have yielded better economies of scale.

34.5 Sanction of special works beyond delegated powers

34.5.1 HQ SNC accorded special works sanction for insulation on top of reinforced cement concrete roof slabs at a cost of Rs.9.19 lakhs in May 1985 and special items of work costing Rs.13.17 lakhs were included in the work for additional storage accommodation for aircraft costing Rs.72.38 lakhs in May 1987, which were beyond the then delegated powers.

34.5.2 HQ Goa area sanctioned in January 1987 the annual maintenance testing of anchor points at INS Hansa at an estimated cost of Rs.1.39 lakhs as a special work which was beyond the delegated powers of Rs.0.75 lakh of the organisation.

34.6 Unauthorised or specifically prohibited works

34.6.1 Cycle sheds at Bombay

Scooter or cycle sheds are not authorised to be provided in residential accommodation in Bombay and Calcutta. However, in August 1985 HQ WNC accorded sanction in violation of these specific orders for the provision of cycle sheds at Navy Nagar, Bombay at an estimated cost of Rs.4.85 lakhs.

34.6.2 Ceiling fans and water coolers

Lonavala is categorised as a cold/hill station and provision of ceiling fans and water coolers is not authorised for such stations. However, a test check of a few sanc-

tions accorded by Naval HQ and HQ WNC indicated that provision of ceiling fans and water coolers had been made therein against Government orders. The matter was stated to have been taken up by Naval HQ with Government in 1986 but a decision was awaited in September 1988.

34.7 Cancellation/modification of administrative approvals at the instance of Audit

34.7.1 HQ SNC accorded administrative approval in May 1987 for the construction of married accommodation for officers and MES key personnel at Chilka at an estimated cost of Rs 48.06 lakhs although surplus accommodation for 12 officers existed at the station and was being used for other purposes. On being pointed out in Audit in July 1987, the sanction was cancelled.

34.7.2 In November 1983, HQ WNC accorded an administrative approval for additions and special repairs costing Rs 4.59 lakhs to a requisitioned building at Bombay which was constructed in 1858. Powers delegated to field authorities to incur expenditure on requisitioned buildings were withdrawn in December 1969. On being pointed out in Audit in February 1984, HQ WNC cancelled the work in September 1984.

34.7.3 Air conditioning of the TV rooms of an officer's mess at Visakhapatnam sanctioned at Rs 1.13 lakhs by HQ ENC in January 1984 was cancelled in April 1985 when pointed out by Audit in October 1984.

34.7.4 A sports stadium with facilities of dressing room, toilets, store room etc is authorised when the troop strength in the station is 3000 or more. The administrative approval of Rs.14.81 lakhs for construction of playing fields etc at Karanja accorded by HQ WNC in March 1984 was reduced in November 1986 to Rs.12.03 as a result of an Audit observation after deleting the facilities which were not authorised for the station.

34.7.5 In June 1983, the replacement of barbed wire fencing with wire mesh fencing, etc was sanctioned at an estimated cost of Rs.13.60 lakhs by HQ, WNC in violation of instruction of November 1978. On being pointed out by Audit in October 1983, a revised administrative approval was issued in November 1984 for Rs.5.05 lakhs for barbed wire fencing, resulting in saving of Rs.8.55 lakhs.

The matter was referred to the Ministry in June 1989; no reply has been received (November 1989).

TRAINING

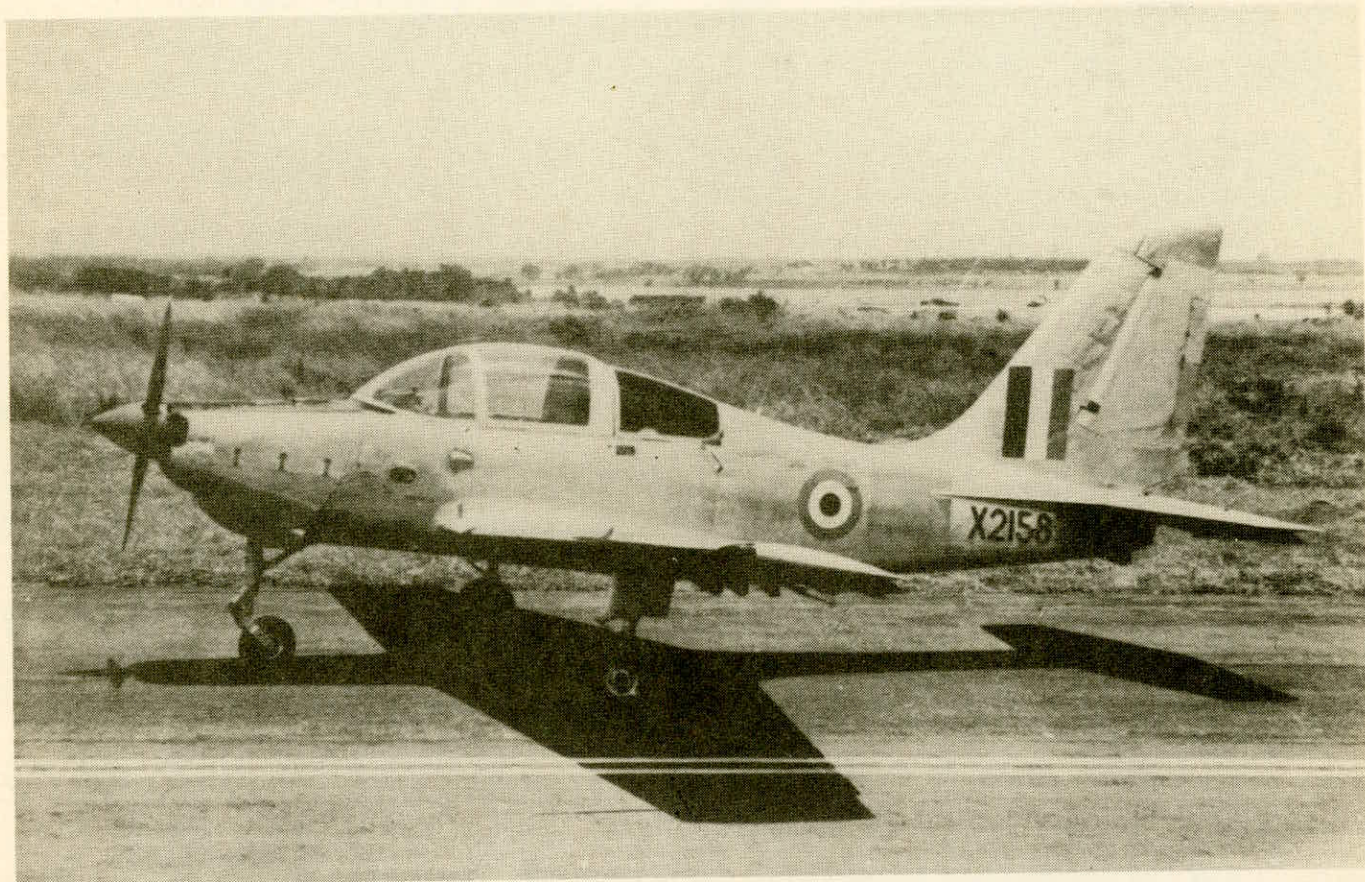
35. Training of Naval pilots

The Indian Navy do not have a training establishment for conducting ab initio training of pilots. The Naval requirements are met by the Air Force (IAF). The IAF agreed to train only a certain number of Naval pilots every year, as it was unable to meet the total requirements of the Navy due to lack of aircraft and infrastructure facilities. A proposal for training the remaining pilots with the flying clubs under the Director General of Civil Aviation (DGCA) as an interim measure was approved by the Ministry in February 1980. The training at flying clubs is conducted on Pushpak aircraft which is considered unsuitable for training military pilots. Further, the flying clubs do not possess aerobatic aircraft and this was considered a major hindrance in the training of Naval pilots. The Naval HQ, therefore, considered it essential to acquire a few basic aerobatic trainers to provide the necessary training and experience in aerobatics, formation flying, stalling and spinning. This requirement was accepted by the Ministry. The Naval HQ proposed to the Ministry in March 1985 that eight HPT-32 trainers be acquired from Hindustan Aeronautics Ltd (HAL). The Ministry sanctioned in December 1985, the acquisition of eight HPT-32 aircraft, ground support maintenance spares, spare engines, etc. at an estimated cost of Rs.760 lakhs. In March 1986, Naval HQ

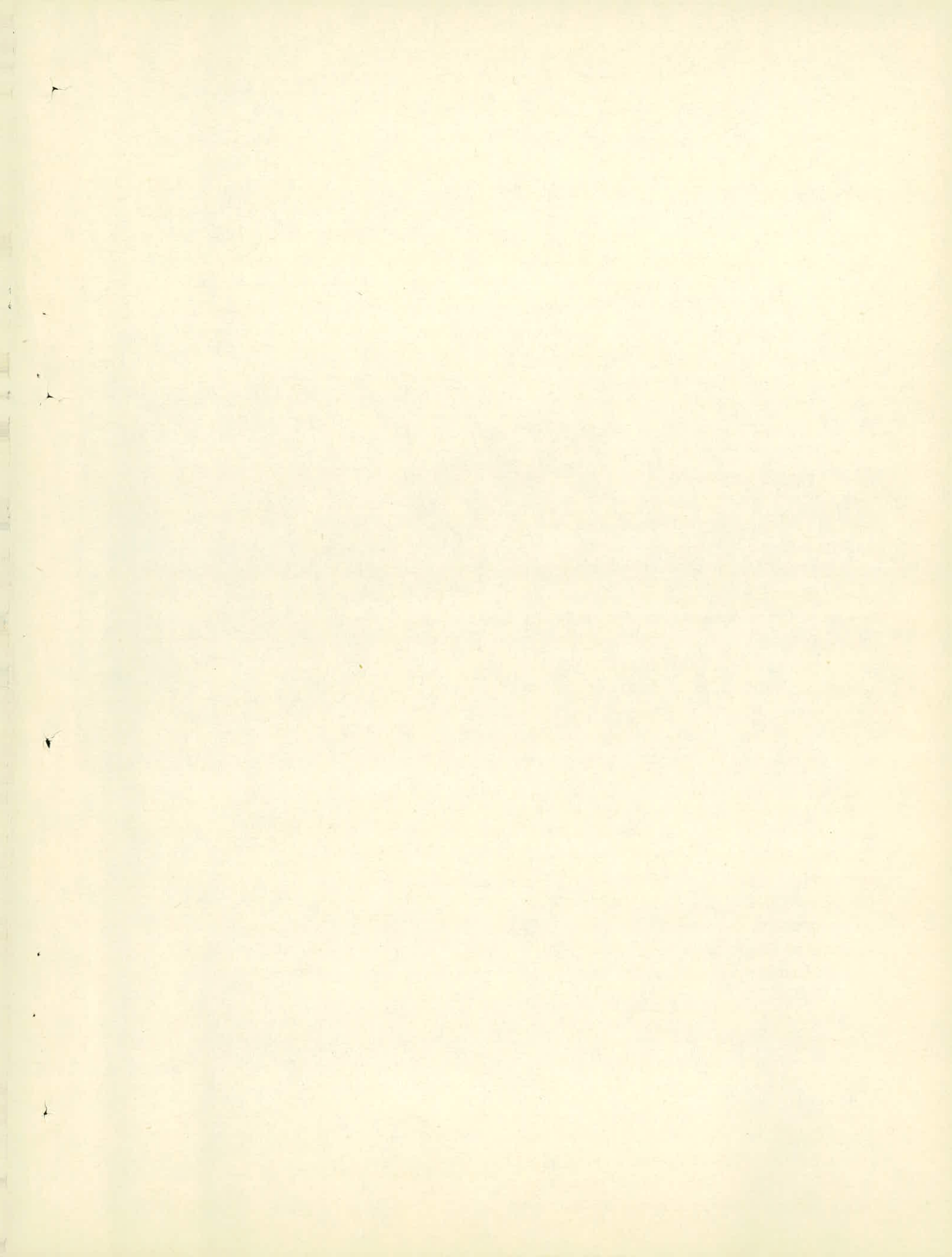
placed an order on HAL for the supply of the aircraft, spares etc. The aircraft were delivered between December 1986 and March 1987 and allotted to a Naval air squadron. First line servicing facilities were also set up at a cost of Rs.1.01 crores. After the receipt of the aircraft, 13 pilots were trained in aerobatics in 1987. Further, during the same year, six pilots were also given ab initio training on a trial basis. There had been no training of pilots (ab initio or aerobatics) on these aircraft after 1987 due to an insufficient number of volunteers. The Naval HQ stated in May 1989 that the training of pilots is dependent on the volunteers for flying and no training was proposed in the Naval air squadron on these aircraft for 1989 and 1990 as well, since the IAF had been able to absorb Naval requirements of ab initio training.

The average serviceability of aircraft was poor. The monthly serviceability ranged from 69.2 to 17.34 percent between March 1988 and February 1989. The poor serviceability was attributed by the Naval authorities to lack of maintenance and logistic support from HAL. Two aircraft also crashed in February 1988 and March 1989.

Thus eight HPT 32 aircraft acquired at a cost of Rs.7.60 crores to provide the necessary training and experience in aerobatics to Naval pilots could provide training only to 13 pilots since 1987. No training in aerobatics was imparted during 1988 and 1989 and no training is proposed for 1990 as well due to non-availability of sufficient volunteers. Therefore, the purpose for which the aircraft were procured and for which first line facilities were set up at a cost of Rs.1.01 crores has not been achieved and the investment made has turned out to be largely infructuous. The Ministry stated in September 1989 that the Navy were carrying on a dialogue with the IAF for the transfer of their six aircraft to the IAF for the training of Naval pilots so as to ensure the optimum utilisation of the aircraft.



HPT 32 Aircraft



WORKS SERVICES

36. Construction of residential accommodation in Bombay

Accommodation for 40 married officers, eight single officers, 100 married sailors and 10 civilians sanctioned between March 1984 and October 1985 was constructed at the Naval Stores Depot, Ghatkopar, Bombay at a cost of Rs.337.22 lakhs between March 1987 and December 1988. However, the accommodation had not been occupied till February 1989 in the absence of water supply. According to the Garrison Engineer who executed the work, the matter regarding water supply which had been taken up with the Greater Bombay Municipal Corporation (GBMC) in May 1978 was still pending with them. The GBMC had not provided water supply since the construction had not been cleared by it.

As a consequence, officers for whom the buildings were constructed were accommodated in hired buildings at a cost of Rs.6.96 lakhs upto March 1989. Sailors and civilians had been paid compensation in lieu of quarters and house rent allowance amounting to Rs.4.38 lakhs from the date of completion of the buildings upto March 1989.

The Ministry stated in September 1989 that under the Navy Act, naval constructions were not subject to local building laws. However, in 1986 the GBMC insisted that notwithstanding the provisions of the Navy Act, the local Town Planning Act and Rules necessitate the clearance of building plans, including those of the Navy, by the GBMC and other authorities. As regards delay in occupation, the Ministry stated that the Naval authorities felt that availability of sufficient water would be a problem. The Ministry added that a lot of formalities had to be completed before the taking over and allotment of the accommodation.

The onus of ensuring that Naval constructions were not in conflict with local laws was on the Navy. Its inability to ensure that its building plans had the requisite clearance

with the consequential non-provision of water supply by the GBMC alongwith delays in taking over the buildings led to the buildings remaining unoccupied for periods ranging from 9 to 30 months. Apart from payment of house rent allowance, hire charges and compensation in lieu of quarters, assets worth Rs.3.37 crores were not utilised timely.

37. Designing a dry dock

In August 1978, the Ministry of Defence (Ministry) approved the construction of North dry dock at Visakhapatnam at an estimated cost of Rs.14.78 crores revised to Rs.37.40 crores in July 1987. The audit findings in respect of this project as contained in paragraph 61 of the Report of the Comptroller and Auditor General of India, Union Government, (Defence Services) for the year ended 31 March 1987 (No.2 of 1988) brought out instances of avoidable expenditure and abnormal delay in the construction of the dry dock due to frequent changes in the design during its execution.

During a subsequent audit in 1987-88, it was noticed that the work on all the 22 monoliths required for the extension of the length of the submarine compartment (SMC) from 100 metres to 240 metres was completed in March 1985. This included one monolith constructed at a cost of Rs.16.03 lakhs that functioned as a head wall. In May 1987, it was decided to further increase the length of the compartment from 240 metres to 272 metres. The consequent additional works were sanctioned in July 1987 at an estimated cost of Rs.466.57 lakhs. Since the length of the compartment was being increased, it became necessary to demolish the monolith that functioned as the head wall. The cost of demolition was Rs.11.21 lakhs.

The Ministry stated in September 1989 that in order to accommodate two submarines simultaneously in the SMC based on the future anticipated docking requirements, it was decided to extend the length of the SMC from 100 metres to 240 metres in the first instance. The Ministry added

that although such a requirement was foreseen in 1982, the special project had yet to get underway at that time. However, the action of the Naval authorities in increasing the length of the SMC from 100 metres to 240 metres and in constructing the additional monolith that functioned as the head wall in the first instance was premature because in June 1984 when the Ministry approached the Government for its approval for establishing shore support facilities for the special project, the detailed project report for this project had not been received. The expenditure could have been avoided had the construction of the head wall monolith been undertaken only after necessary details regarding the special project had been received.

In summary, an infructuous expenditure of approximately Rs.27.24 lakhs was incurred as a result of defective planning. This, together with the findings contained in paragraph 61 of the Audit Report *ibid*, indicate the need for instituting better planning processes to avoid the recurrence of such cases.

38. Setting up of a naval aviation enclave at Meenambakkam

The Ministry of Defence (Ministry) sanctioned in November 1974 the transfer of management of Arkonam airfield together with acquired defence land in the vicinity thereof from the Air Force to Navy. The airfield with all its assets was taken over by the Navy in February 1975. The Ministry sanctioned the establishment of a Naval Air Station at Arkonam in June 1986 at an estimated cost of Rs.99.24 crores. The operational facilities and 50 percent of support facilities are expected to be completed by September 1990 and the remaining facilities are planned to be completed by 1992-93.

While action for the development of the air strip at Arkonam to a Naval Air Station was in progress, the Navy planned to set up a Naval Aviation Enclave at Meenambakkam, 28 nautical miles away from Arkonam and construct essential flying

facilities for the detached operation of shipborne aircraft and the staging of Long Range Maritime Reconnaissance aircraft in 1981.

Headquarters Eastern Naval Command sanctioned in July 1983 the commencement of works services at the enclave estimated to cost Rs.367.27 lakhs without waiting for administrative approval of the Ministry as they were empowered to order the commencement of works services of operational military necessity.

Although the work commenced in October 1983, it was suspended in December 1983 pending the leasing of 47,000 square metres of land required by the Navy from the International Airports Authority of India (IAAI) due to changes proposed in the alignment of the dispersal area and the taxi track so as to conform to the safety requirement of the airport authorities. The Ministry's sanction for the lease of this land for 30 years on payment of an annual rental of Rs.8.32 lakhs subject to revision by IAAI from time to time, was obtained in May 1986 and the land taken over by the Navy in January 1987.

Meanwhile, the Naval Headquarters directed the Command in May 1986 to commence work services at the aviation enclave. The revised estimated cost of the works was Rs. 152 lakhs in September 1989. The administrative approval had not been issued by the Ministry until September 1989. The Ministry stated in September 1989 that 98 percent of the works had been completed and the facility was being put to use. The expenditure incurred upto March 1989 was Rs. 124.80 lakhs.

In view of the fact that the Naval Air Station at Arkonam situated within 28 nautical miles of Meenambakkam is scheduled for commissioning in September 1990, Naval Headquarters were asked by Audit to clarify whether the Navy would require the aviation enclave for detached operation of ship borne aircraft etc. Naval Headquarters stated in June 1988 that the facilities at Meenambakkam would be required even after Arkonam becomes operational in order

to provide diversion facilities for ship based aircraft and emergency landing. It also claimed that such operation would be economical as a distance of 28 nautical miles could be saved.

The Ministry while endorsing the views of Naval Headquarters further stated in September 1989 that Arkonam Naval Air Station does not have a secondary runway and can get blocked by aircraft rendered un-serviceable after an emergency and in such an eventuality the Meenambakkam airfield and associated taxi-track and dispersal at the enclave could be made use of.

The Ministry's reply was not understandable in as much as the civil air station at Meenambakkam can be utilised for emergency landings and a distance of 28 nautical miles in aviation terms (a few minutes flying time) is not sufficient to justify the creation of separate facilities at Meenambakkam when the Arkonam station will be able to provide these from September 1990. Also during 1981 to 1988, there was not a single instance of emergency landing of Naval aircraft on IAAI airport at Meenambakkam.

The fact that the need for the aviation enclave was not reviewed at the time when the Arkonam station was sanctioned is indicative of faulty planning. It will result in the creation of facilities of doubtful utility at an estimated cost of Rs. 152 lakhs with a recurring expenditure of Rs. 8.32 lakhs per annum towards lease charges for IAAI land apart from other annual operating cost. The planning deficiencies together with the absence of the Ministry's administrative approval to the works even after a lapse of above six years requires investigation.

39. Boundary wall at a Naval air station

The Navy took over an airfield at Arkonam in February 1975. While detailed proposals for establishing the Naval Air Station were under consideration, Eastern Naval Command sanctioned the commencement

of work on the construction of a compound wall for 2870 running meters and perimeter fencing for the remaining area in September 1984. This was sanctioned on grounds of operational necessity, to prevent encroachment on Defence land and its use as a thoroughfare. The work which commenced in June 1985 was executed under a contract which was foreclosed in June 1986 after completion of all works but without fixing barbed wire. The cost of works completed was Rs.31.12 lakhs which included the cost of erection of fencing posts at Rs.14.70 lakhs.

In June 1986, the Ministry of Defence (Ministry) sanctioned the establishment of the Naval Air Station at an estimated cost of Rs.99.24 crores. The sanction included the cost of acquisition of an additional area of land besides civil works. Thereafter, another sanction was issued in March 1988 for the provision of additional civil works at a cost of Rs.27.75 crores which included the provision of security fencing and perimeter wall at a total cost of Rs.1.45 crores along the new extended boundary.

The Ministry stated in September 1989 that after the construction of 2870 metres of compound wall and 4775 pillars for 14500 metres of perimeter fencing the contract had to be foreclosed due to non-availability of barbed wire. It added that some of the fencing posts were proposed to be utilised and the rest replanted for the new inner fencing.

The fact, however, remains that the sanction of works without adequate planning led to assets worth Rs.14.70 lakhs (fencing posts) not being utilised. Their proposed utilisation in the new inner security fencing will entail expenditure on retrieval, transportation and replanting.

40. Purchase of flats in Cochin for Naval personnel

In order to meet a deficiency of married officers quarters at Cochin, the Ministry of Defence (Ministry) accorded a sanc-

tion in September 1982, for the purchase of 102 flats (to be converted to 98 flats), from the Greater Cochin Development Authority (GCDA), at a cost of Rs.401.90 lakhs. The GCDA was paid in September 1982, an advance of Rs.321.52 lakhs towards 80 per cent of the cost of the flats as provided under the sanction. The balance was to be paid in two instalments of 10 per cent each on taking over the flats and after the completion of the one year maintenance period. No purchase agreement was signed between GCDA and Navy. An indemnity bond was signed in September 1982 between GCDA and Navy. Although in the correspondence preceding the indemnity bond, GCDA had agreed to pay interest on the advance in case of delay in handing over the flats beyond June 1983, the indemnity bond provided repayment of the advance with interest at 14 per cent per annum in case the GCDA failed to provide the flats. The GCDA did not adhere to the schedule and made over the flats to the Navy between June 1984 and May 1985. Interest amounting to Rs.55.31 lakhs for the period of delay from July 1983 to May 1985 was not recovered from the GCDA. The delay in making over the flats postponed the envisaged saving towards payment of hiring charges for the accommodation hired for Naval officers. The hiring charges paid for the period of delay of 11 to 23 months amounted to Rs.13.56 lakhs. The Ministry stated in November 1989 that the HQ Southern Naval Command (SNC) took up the matter with the GCDA for payment of interest in July 1983 but GCDA had replied that flats could not be handed over due to reasons beyond their control. The Ministry further added that attempts to recover the amount have once again been resumed.

Another sanction was accorded by the Ministry in January 1987 for the purchase of 108 flats from the Kerala State Housing Board (KSHB) at a cost of Rs.340.34 lakhs for providing married accommodation to senior sailors at Cochin. A Board of Offi-

cers which assembled in February 1987 pointed out certain defects to be rectified before taking over the flats. However, in March 1987 payment of Rs.336.96 lakhs on production of a bank guarantee for Rs.33.7 lakhs was made to the KSHB. Though a formal handing/taking over was signed in March 1987, the flats were actually ready, after rectification of defects, for occupation in December 1987. The flats were taken over in February 1988 and were allotted between March and May 1988. Thus, the accommodation for which payment was made in March 1987 was actually ready for occupation in February 1988 after a lapse of 10 months of payment. There was no provision for recovery of interest from KSHB for their delay in handing over the flats in a habitable condition. Because of the delay in availability of the quarters, compensation in lieu of quarters (CILQ) was continued to be paid to the senior sailors. The CILQ paid during the period from April 1987 to February 1988 amounted to Rs.5.35 lakhs.

The Ministry stated in November 1989 that no agreement was made with the KSHB for the purchase of flats and that payment was made to avoid lapse of funds even though it was known that the buildings would not be taken over until after the defects were rectified. Thus, in the purchase of flats worth Rs.7.42 crores from GCDA and KSHB, defence authorities failed to specify the penalties in the event of sellers defaulting after receiving the payment. This resulted in non-recovery of interest for the delay in handing over the flats besides the payment of hiring charges of Rs.13.56 lakhs and CILQ of Rs.5.35 lakhs.

41. Construction of VVIP accommodation in violation of delegated powers

In December 1980, Naval Headquarters sanctioned the construction of a six storeyed building for 43 single officers at Vishakapatnam at a cost of Rs.46.10 lakhs. In October 1983, the sanctioned cost was in-

creased to Rs.50.14 lakhs to provide for conversion of six quarters on the fifth floor into two VVIP and four VIP suites. The work was completed in January 1986. The Eastern Naval Command had also sanctioned in July and November 1986 two works at a total cost of Rs.13.08 lakhs for additions and alterations to eight single officers' quarters on the fourth floor of the building for conversion into eight VIP suites.

A Board of Officers convened in December 1986 observed that the VVIP accommodation constructed on the fifth floor of the building was not suitable for a visiting VVIP, as there was likelihood of mechanical failure of the lift. Besides, the building did not have an escape route in the eventuality of fire. Therefore, the Board recommended construction of five single officers' accommodation to be converted into a VVIP suite. While recommending the work, the Board did not establish an actual deficiency of single officers' quarters. The work was sanctioned in December 1986 by Headquarters Eastern Naval Command at a cost of Rs.9.98 lakhs. Provision of air conditioners and special furniture at a cost of Rs.5.51 lakhs was sanctioned in January 1987. Another sanction for the provision of external services at a cost of Rs.2.18 lakhs was accorded in February 1987. As the building was clearly to accommodate VVIPs and not meant to be single officers' quarters, it should have been sanctioned as a special work by the Naval Headquarters since it exceeded the financial powers of Eastern Naval Command in regard to the sanction of special works.

A contract for construction of the accommodation was concluded in January 1987 and the work was completed in March 1987 at a cost of Rs.12.95 lakhs. The external services were provided at a cost of Rs.0.60 lakh under a separate contract.

The Ministry of Defence stated in October 1989 that deficiency in single officers accommodation was not established by the board in December 1986 due to paucity of time though there was a deficiency of 64

units, the VVIPs and VIPs were accommodated as guests of Navy without collection of revenue and a separate accommodation for a visiting VVIP was sanctioned in December 1986 because the earlier two suites created suffered from inadequate safety and security and an alternative lift. While the Ministry did not furnish information regarding occupancy of the suites, Audit found that the occupancy of the eight VIP suites by single officers during January 1988 to June 1989 only ranged from a minimum of one month and six days to a maximum of seven months and four days.

In summary, the case reveals violation of norms of financial propriety in that accommodation sanctioned for single officers' had been reappropriated for use by VVIPs and VIPs by

- (i) carrying out additions and alterations;
- (ii) not having taken up the work as special for a separate sanction; and
- (iii) not having regard to the basic requirements of security and fire hazard.

Another five single officers accommodation was constructed with the ab initio intention of converting them to VVIP suite at a cost of Rs.19.06 lakhs in violation of powers delegated to the command.

PROVISIONING

42. Procurement of dinghies

A dinghy is a life raft used by Naval aircrew in case of emergency. Naval Headquarters (HQ) placed an indent for the procurement of 20 dinghies in March 1983 on the Controller of Procurement, Bombay (CPRO). The CPRO concluded a contract in November 1983 with a firm for the supply of the dinghies with specification 'B' at a cost of Rs.2.57 lakhs. The supply, which was due in December 1983, materialised in April 1984. On inspection by the user unit on receipt, the dinghies were found to have defects/deficiencies and were returned to the firm for rectification. On receipt from the firm in April 1985 the user unit still found

the dinghies unsuitable. Thereafter, though the firm again rectified the defects, in January 1986, inspection was delayed due to want of an approved sample. Later, in May 1987, in the absence of an approved sample the dinghies were found not acceptable by the user unit.

The poor quality of the dinghies supplied notwithstanding, the Department of Defence Supplies (DDS) and the CPRO placed orders on the firm in September 1985 and March 1986 for the supply of 14 and 30 dinghies at Rs.1.65 lakhs and Rs.5.17 lakhs respectively. While the order of the DDS indicated specification 'A', that of the CPRO indicated specification 'B'. The supplies against these two orders materialised in March 1986 and June 1986 but the user stated in May 1987 that "None of these life rafts are considered safe for use in Naval aviation and therefore being rejected as unserviceable".

Strangely enough, the CPRO persisted with the same source of supply and concluded another contract in January 1987 with the firm for the supply of another 15 dinghies, at a cost of Rs.2.33 lakhs.

Subsequently, in July 1987, Naval HQ issued instructions to suspend further transactions with the firm till further instructions, as their performance had proved most unsatisfactory. With a view to avoiding adverse comments from Audit, Naval HQ issued directives to various units in August 1987 to utilise the dinghies and to review the governing specifications. The review of the governing specifications was considered necessary as the order for 15 dinghies was pending, awaiting confirmation of governing specifications.

Against the contract of January 1987, the supply of 12 dinghies materialised in March 1988, after which the order was short closed. The Ministry stated in September 1989 that the dinghies were found conforming to the governing specifications and accepted in inspection although, later, the user during receipt inspection found a few de-

fects/deficiencies. It added that the specification was revised in May 1983 but the supply order of September 1985 for balance 14 dinghies out of the indent of November 1980 was with earlier specification 'A'. All the 64 dinghies were accepted in August 1987 after the defects were rectified to the satisfaction of the user. The order of January 1987 for 15 dinghies was not cancelled to avoid legal complications but the inspection was suitably amended to include representative of the user in addition to DTD&P (Air) and the dinghies cleared.

In summary, the case of purchase of a vital life saving equipment worth Rs.11.72 lakhs reveals that the governing specifications were deficient. Further, inspection carried out was incomplete and defective as subsequently pointed out by the user. Fourteen dinghies were ordered in September 1985 to specification 'A' when in May 1983 specification 'B' had already been finalised. The clear opinion of the user in May 1987 that none of the dinghies was acceptable for use in Naval aviation and the subsequent acceptance of these dinghies as merely conforming to governing specifications would warrant an investigation to see whether safety was compromised.

43. Design of detonators for scare charges

Scare charges are explosive devices used by the Navy in operations against underwater saboteurs. A number of failures of scare charges were noticed during 1979. As a result of investigations, it was established that failure was due to defective detonators used in the devices. This necessitated modification in the design of the detonator. Naval Headquarters (HQ), therefore, decided in May 1982 to withdraw these detonators from service. Disposal of detonators was ordered in 1983 and the quantity disposed of worked out to 75,640.

Meanwhile, in 1981, a modified detonator was manufactured by the Director General of Ordnance Factories (DGOFF). It

was accepted after successful trials and clearance by the inspection authority. Thereafter, Naval HQ placed supply orders on the DGOF for the supply of 224719 detonators between 1981 and 1987.

However, during test, this detonator was also found defective due to its incompatibility with the striker mechanism. Detonators are fitted with striker mechanism which in turn is fitted on the scare charges. Large scale failures of scare charges were reported by ships in early 1984. Investigation revealed that the failures were due to unsuitable cap chamber, a part of detonator. On an investigation it was found feasible to modify the striker mechanism by enlarging the counter bore and utilise the detonator. It was, therefore, decided to carry out modifications to 1,20,000 striker mechanisms of the scare charges already supplied at a total cost of Rs.6.60 lakhs. Naval HQ had placed two indents one in April 1985 and another in May 1989 for the modification of 60,000 strikers at a cost of Rs.3.30 lakhs.

In summary, failure on the part of inspection authority to determine the required design of the detonator and in not assessing the suitability of a common item before clearance of bulk production of the modified detonator, had resulted in an extra expenditure of Rs.3.30 lakhs.

44. Procurement of Vacu blast machines

In July 1974, a Survey Board declared three Vacu blast machines held at the Naval Dockyard, Bombay, as beyond economical repairs but recommended their utilisation till replacements were received. No action was taken by Naval Dockyard for their replacement till November 1978.

A quotation for the machines and spares was received in December 1978 from a foreign firm through its local agents at Rs.3.79 lakhs each valid for six months. Naval Headquarters (HQ) approached the inspection authority in February 1979 for import clearance. The inspection authority

intimated in April 1979 that they were exploring the indigenous availability of the machine. The Ministry stated in September 1989 that the Navy was then aware that such robust and reliable machines meeting the stringent specifications of the Navy were only manufactured abroad.

The inspection authority was unable to find a competent domestic manufacturer between April 1979 and June 1982 and gave import clearance in August 1982.

Based on a revised quotation received in June 1983 from the same firm, Naval HQ raised an indent in February 1984 on the Supply Wing of a mission abroad who concluded a contract in July 1984 at a total cost of Rs.20.06 lakhs. The cost of common items in both the quotations was Rs.19.82 lakhs. The items were received by the Dockyard in August 1985. As a consequence, the Navy procured the very same machines in 1985 that had been offered in 1978 but at an additional cost of Rs.8.46 lakhs in foreign exchange.

The Ministry stated in October 1989 that instructions had been issued in July 1989 to all concerned to avoid such lapses in future.

45. Purchase of blowers for a ship

In August 1983, the Controller of Material Planning, Bombay raised an operational demand for two forced draught fan (blowers) required for the refit of a Naval ship. In December 1983, an indent was placed on a Supply Wing (SW) of an Indian mission abroad by Naval Headquarters (HQ) for procurement of the blowers on priority from a foreign firm on proprietary basis. In August 1984, the SW forwarded the offer of the firm to Naval HQ for pre-scrutiny. The price quoted by the firm was Rs 2.04 lakhs for two blowers. The Naval HQ intimated the SW in August 1984 that the firm had offered a different type of blowers but would be acceptable if these were fully suitable for replacement of the existing blowers.

Meanwhile, in November 1984, the Naval Attache in the foreign country informed Naval HQ that the firm did not exist and forwarded a quotation from another firm for the supply of two blowers at the cost of Rs 4.06 lakhs. The offer was valid up to January 1985. Naval HQ sent the quotation to SW in December 1984 and followed it with two reminders requesting SW to conclude the contract quickly as the requirement was critical. The SW did not receive this quotation and therefore, did not respond to Naval HQ. Subsequent reminders were wrongly linked by SW with the quotation of the firm that was sent by them and replied to Naval HQs accordingly. Naval HQs had also not pointed out the error. In February 1985, Naval HQ called for drawings and technical specifications from the firm and after scrutiny asked the SW again to process the order. With a view to processing the order, the SW called for firm's quotation. Naval HQ then requested the SW in March 1985 to hold the indent in abeyance and had it finally cancelled in July 1985. While sending the drawing of new and old blowers the firm quoted the rate of motor as Rs. 1.14 lakhs each in addition the price of blower already quoted. In March 1985, the firm had informed the Naval HQ that the validity of their offer was only up to January 1985 and offered a fresh price of Rs.8.93 lakhs for each blower with a delivery period of 10 to 12 months. The Ministry stated that the firm's offer was addressed to its local agents hence Naval HQ did not take any action on it. Meanwhile in March 1985 the Indian agent of this firm offered to supply the blowers at a budgetary price of Rs.11 lakhs for each blower with a lesser delivery period of six to seven months. Based on a fresh indent of April 1985, the offer was processed by Director General of Supplies and Disposals (DGSD) and an order was placed on Esquire Marine (local agents) at a total cost of Rs.24.85 lakhs including transportation and other charges. Starters for the blowers were not supplied by the firm. Hence in September 1985 the

order was amended to enable the supply of the starters. The blowers and starters were supplied in September 1985 and February 1986 respectively. The starters were found to be defective and were got replaced in July 1986.

Thus, though the second firm had indicated that the validity of their offer was only up to January 1985, yet the Naval HQ did not pursue it effectively. Ultimately, the order was placed on the Indian agent of the second firm for supply of blowers at a much higher price. Consequently the blowers asked for in December 1983 on an urgent basis which were critically required were finally supplied in September 1985 and made operational only in July 1986. The extra expenditure involved in the purchase amounted to Rs.13.99 lakhs without taking into account the increase in packing, freight, etc..

46. Procurement and utilisation of hydrographic survey equipment

Issues relating to exclusive economic zones and maritime boundaries make it imperative for navigation and oceanic maps and charts to be of extremely high resolution and totally accurate. To meet this objective, Naval Headquarters(HQ) proposed in June 1979, the installation of an imported geodetic satellite survey system (system) in the three survey ships and four survey craft under construction in indigenous yards. It stated that the requirement was urgent as the installation of the system was to be completed just prior to their commissioning during 1979 and 1980 and it could not wait for the indigenous development and manufacture of the system.

Based on Naval HQ proposal the Ministry of Defence(Ministry) sanctioned in October 1979 the procurement of a system by import for equipping the Naval Hydrographic Department, setting up shore based maintenance facilities and specialised training at an estimated cost of Rs.2.11 crores. The system for three survey ships and a train-

ing establishment were to be procured during 1979-80 at a cost of Rs.117 lakhs and for the four survey craft and the dockyards during 1980-81 at a cost of Rs.73 lakhs.

The system consists of three major components viz., mobile surveyor, geodetic land survey sets and computing centre. For reasons of economy and operational considerations, Naval HQ decided that the designated ships and establishments would be allotted only such components of the system as are absolutely essential. The computing centre, which is one of the three components, was to be installed in the three survey ships, two survey craft and one training establishment.

In July 1979, Naval HQ had confirmed that the system proposed to be installed was "the latest product that hydrographic technology could offer". It also confirmed that the system was "the most sophisticated and efficient system available at present". It added that within the foreseeable future it seemed unlikely that any innovation in this technology would replace the system. Naval HQ, after evaluating various systems, found that the system offered by a foreign firm was the most reliable and accurate.

The first lot of the system required for the survey ships and training establishment was ordered for procurement at a cost of Rs.126.41 lakhs in May 1980. The second lot for the survey craft was ordered for procurement at a cost of Rs.82.46 lakhs in March 1981. Both these purchases were made through supply wing of an Indian Mission abroad. In these purchases, an Indian agent of the foreign firm was paid a commission of Rs.19.54 lakhs against a maximum permissible commission of Rs.1.09 lakhs as per the guidelines of the Ministry of Defence.

The first ship scheduled for commissioning in July 1979 was commissioned in February 1981. The other two ships scheduled for commissioning in July 1981 and July 1982 could be commissioned only in

October 1983 and August 1985 respectively. Therefore, only one system could be put to use immediately after its receipt. The system procured for the training establishment also could not be fully exploited as the training task was transferred to the Naval Hydrographic School where an updated version of the system procured from the same foreign firm against the order placed in December 1980 had been installed in July 1983. Naval HQ stated in January 1989 that the system lying in the training establishment would be transferred to the Hydrographic School.

In March 1982, Naval HQ projected that the central processing unit of the computing centre procured against the purchase order of May 1980 was being phased out by the manufacturer and the firm had offered to exchange them with the updated version in the three survey ships. The additional cost worked out to Rs.31.66 lakhs. The computing centres were returned to the firm in October 1980. Naval HQ took up the case for updating them only in March 1982. As the older version of the computing centre had gone out of production and keeping in view the high rate of consumption of spares by the system installed in the first survey ship in February 1981, Naval HQ apprehended that unless the computing centre was updated, the entire system might become unusable as spares would not be available. Government sanctioned the updating of the system in February 1988 only. The delay of about six years in the issue of the Government sanction was mainly on account of (i) incorrect assessment by Naval HQ of the number of computing centres to be updated and the scope of updating (ii) dispute between Naval HQ and Ministry of Defence(Finance) over the employment of Indian agent and his remuneration and (iii) escalation in cost during the intervening period.

A contract was concluded by the supply wing of an Indian Mission abroad in October 1988 at a cost of Rs.48.76 lakhs. The items were received in May 1989. The

airfreight and insurance charges paid was Rs.5.12 lakhs (approximately). The delay in issue of sanction resulted in additional expenditure of Rs.17.10 lakhs excluding transportation cost.

The usable life of an electronic survey equipment is five to seven years. The systems installed in the three survey ships between 1981 and 1985 were without the computing centres. Therefore, the systems could not be fully exploited. By the time the updated version of the computing centre is installed, the other constituent units of the system would have outlived their usable life due to the inordinate delay. The Ministry stated in October 1989 that the two constituent units would be replaced by their updated version, compatible with the updated computing centre .

In short, the case reveals defects in evaluation leading to avoidable expenditure of Rs.53.88 lakhs, sub-optimal utilisation of systems procured for meeting an essential requirement and delays in updating the system. Above all, the investment in the updated computing centre would be largely infunctious as the constituent units of the system would be completing its usable electronic life in 1988-89.

47. Procurement of rocket launchers

In April 1974, Government approved a proposal of Naval Headquarters (HQ) to fit a certain type of rocket launcher (type X) manufactured by Bofors of Sweden, as a part of a modified weapon system, on a certain class of ships manufactured by a public sector undertaking (PSU). Based on the rates quoted by Bofors in June 1973, the PSU concluded contracts in April 1975 for the supply of the launchers as well as onboard spares and test equipment. Though the firm quoted for the launchers as well as the ammunition, etc, Naval HQ did not take action to procure the ammunition and other items simultaneously on the assumption that Bofors would supply these at the same rates subsequently. Even full details of the am-

munition were not called for. However, after finalisation of the contract for the launchers, Bofors quoted exorbitant rates for the ammunition, etc. in November 1976. The Negotiating Committee and Naval HQ felt that the firm took advantage of the situation because the purchase of the ammunition was inescapable at that stage. Finally, the contract for the ammunition, etc. had to be concluded in March 1977 at an extra expenditure of Rs.1.09 crores. The items were received on schedule in May 1980.

The Ministry of Defence stated in October 1989 that the ship fitted items like launchers were ordered by Mazagon Dock Limited and the ammunition items were contracted by the Ministry. It added that there was no alternative other than Bofors (type X) system and complete technical information could be obtained in November 1976. Earlier, in March 1977, it was recorded by the Ministry that since the launchers and rockets were part of the same weapon system, the rockets should also have been ordered together with the launchers and the delivery dates could have been staggered to suit the defence requirements.

The contract concluded in March 1977 catered inter alia, for a test equipment costing Rs.8.54 lakhs required for testing the fuzes of rockets. It was received in May 1980 in a damaged condition but was rectified in 1982 free of cost by the supplier. However, to meet emergent situations, when the existing set is not functional temporarily, a sanction was accorded by Government in September 1983 for the procurement of another modified version of test equipment from Bofors at an estimated cost of Rs.32.79 lakhs, as a standby arrangement. Although the volume of work did not fully justify the procurement of a second equipment in terms of the utilisation of the set already procured, a contract was concluded in December 1983 for the second set of test equipment at a cost of Rs. 29.48 lakhs. The equipment was received in February 1986. Both the equipment were installed only in February 1986

because of delay in completion of civil works, but the testing of fuzes did not commence till May 1988 as the stipulated temperature and humidity conditions could not be achieved. The Ministry stated in October 1989, that the equipment were being used under relaxed temperature and humidity conditions, granted by the inspection authority, since May 1988 and the second equipment was sanctioned as stand-by equipment.

The case reveals:

- failure on the part of Naval HQ in not combining the procurement of the launchers and the ammunition and concluding the contract for launchers even before obtaining complete details of its ammunition, had resulted in an extra expenditure of Rs.1.09 crores.
- the test equipment received in 1980 and 1986 at a cost of Rs.8.54 lakhs and Rs.29.48 lakhs respectively could not be put to any use till May 1988 since specified temperature and humidity conditions were not available.
- fuzes were stated to have been tested between May 1988 and February 1989 under relaxed temperature and humidity conditions; and
- the procurement of a stand-by equipment costing Rs.29.48 lakhs for testing of fuzes was not fully justified by the volume of work.

48. Procurement of computers

A technical committee was appointed by the Ministry of Defence (Ministry) in October 1976 to examine the requirement of computers at Naval Dockyard Visakhapatnam and Bombay. The committee recommended in 1981 a distributed data processing system. A proposal made by Naval HQ in June 1982 for the setting up of two computer complexes at Bombay and Visakhapatnam with the ultimate objective of developing and operating a fully integrated computer based command and control system at

an estimated cost of Rs.5 crores was approved by the Defence Computer Committee in June 1982. Each complex was to have one main frame computer as host computer and five mini computers as satellites. To create necessary infrastructure, two truncated establishments were set up in October 1982 at both the stations. Based on the system specifications drawn by Naval HQ, the Department of Electronics (DOE) invited global tenders in September 1983. While the quotations received in November 1983 were being processed by the DOE for import clearance, Naval HQ felt that the computer being procured by DOE would be available only by the first quarter of 1985 and that would seriously hamper its computerisation programme. Naval HQ, therefore, proposed in April 1984 the procurement of six indigenous satellite computer system, available off-the-shelf to meet immediate requirement at a cost of Rs.90 lakhs so that the system would be available by end 1984. The case was therefore withdrawn from DOE in May 1984. Meanwhile Ministry issued another sanction in May 1984 for the procurement of an indigenous mini computer system at a cost of Rs.20 lakhs, setting up facilities at a cost of Rs.2.5 lakhs and maintenance at a cost of Rs.3 lakhs per annum at Naval store depot, Goa. The procurement of this system was clubbed with the procurement of six satellite systems for Bombay and Visakhapatnam.

Tenders for procurement of mini computers invited in June 1984 and received in July 1984 were evaluated by the Naval HQ only in February 1985. Therefore, the purpose of withdrawing the case from DOE was not achieved. There had been considerable changes in the computer market on account of several concessions announced by the Government. It was therefore, decided to invite fresh quotations from the short listed firms. Ministry sanctioned in July 1985 procurement of six satellite computer systems at Bombay and Visakhapatnam at a cost of Rs.150 lakhs. The acceptable offer of a state public sector un-

dertaking (PSU) at Rs. 27.57 lakhs per system exceeded the sanctioned amount and, hence a revised sanction of the Ministry was obtained in January 1986 for Rs.180 lakhs for the system, Rs.20 lakhs for creation of facilities and maintenance at a cost of Rs.31 lakhs per annum. In May 1986, procurement of the remaining four mini computers for Rs.120 lakhs was also sanctioned by the Ministry. Procurement action for the host computers is planned to be initiated in 1990-91 after the satellite computers are procured and installed.

Although the placement of orders on the PSU, as recommended by Naval HQ was approved by the Ministry, there was a delay in concluding the contract as the PSU could not finalise arrangements with a foreign firm for supplying specified software. Two contracts were ultimately concluded with the PSU in September and October 1986 respectively for supply of a super micro 32 V computer system with five on-line interactive terminals and six intelligent terminals for Rs.23.74 lakhs for Naval store depot, Goa and for supply of three each of the same system with additional terminals for Rs.26.81 lakhs per system. Standard software packages for operating system, utilities, computers etc. were also to be supplied in both the cases. Contract for the remaining four mini computers had not been concluded so far (June 1989).

Although both the contracts were concluded within a short span of 14 days there was an enhancement in the rate for isolation transformer and voltage stabiliser by Rs.32,210 per system in the contract concluded in October 1986 leading to an extra expenditure of Rs.1.93 lakhs.

The system at Naval store depot, Goa was to be delivered by December 1986 and those at Bombay and Visakhapatnam during January to March 1987. The firm could supply the system at Naval store depot, Goa only in 1987 and the system for Bombay and Visakhapatnam in August/September 1987. The systems have, however, not been

accepted so far (May 1989) due to the following reasons:-

- the PSU was not yet ready to conduct final acceptance test;
- inability to rectify the defects by the PSU and shortages in delivery of hardware, software and documentation;
- lack of infrastructural support facilities at these stations; and
- inability of the PSU to provide maintenance support at different locations.

No liquidated damages had been levied on the PSU. Naval HQ stated in April 1988 that the levy of liquidated damages was linked to the delivery of the system and not to the acceptance of the system and that there was no definite date in the contract for acceptance of the system. The delivery of the hardware was accepted without licenced software with the promise that the software packages would be delivered prior to acceptance of the system.

Due to the delay in receipt of the computer system at Naval dockyard, Bombay, computer time at a cost of Rs.41.14 lakhs had to be hired from civil sources from January 1983 to January 1989. Naval HQ stated in April 1988 that the inability of the PSU to complete the work resulted in a net saving of Rs.0.80 lakh per month to the Indian Navy as in the event of acceptance of the system, maintenance charges of Rs. 1.2 lakhs per month was required to be paid to the PSU whereas the hire charges were Rs.0.40 lakh per month.

The case reveals evidence of lacunae in the planning and acquisition of EDP facilities, absence of cost benefit analysis, avoidable expenditure of Rs.41.14 lakhs for the hiring of computer time and low utility of the manpower resources in the truncated establishments created in 1982. Further the computers procured and installed at a cost of Rs.222.5 lakhs remain unutilised from September 1987 to date (June 1989).

The matter was reported to the Ministry in June 1989; no reply has been received (November 1989),

OTHER CASES

49. Receipt of a damaged machine

Naval Headquarters (HQ) sanctioned the procurement of a crank shaft grinder machine at a cost of Rs.7.20 lakhs for the Naval Dockyard, Vishakhapatnam in September 1983. A supply order for the machine was placed on Hindustan Machine Tools Ltd in October 1984 at a cost of Rs.6.91 lakhs excluding insurance and transportation charges. The machine was received in July 1985, six months after it was despatched, in a damaged condition. An insurance claim for the damages amounting to Rs.1.20 lakhs was preferred in March 1986. The claim had not been settled by the insurance company even after the issue of a legal notice in July 1988. The Naval Dockyard had instructed the Government pleader in February 1989 to file a civil suit to realise the insurance claim.

No action was taken to repair the machine which was non-operational since its receipt in July 1985. In the absence of the machine, the Dockyard could not undertake urgent and operational jobs.

The Ministry of Defence stated in September 1989 that action was taken to settle the claim on the insurance company on priority basis and the machine was not got repaired pending settlement of the claim. In the absence of the machine, the operational requirements of the Dockyard were met by makeshift arrangements.

In summary, an asset worth Rs.6.91 lakhs received in a damaged condition had not been repaired even after four years of its receipt, and legal action was yet to be taken. Meeting the operational requirements by makeshift arrangements for over four years calls for a review of the requirement of a third machine for the Dockyard.

50. Over payment of wage escalation

In January 1976, Government entered into a contract with a public sector undertaking (PSU) for the construction of four Seaward Defence Boats (SDBs) at a cost of Rs.12.56 crores. The cost included a labour element of Rs.45.88 lakhs per SDB on the basis of 6.93 lakh manhours required for each SDB. The contract further provided for wage escalation in respect of manhours booked subsequent to June 1977 subject to an overall ceiling of 6.93 lakh man hours per SDB. However, the escalation was payable only in respect of those manhours booked upto the contractual delivery date for each SDB.

According to the contract, the four SDBs were to be delivered in December 1978, February, May and August 1979. However, the PSU did not adhere to the contracted delivery schedule. The SDBs were delivered in December 1980, November 1981, September 1982 and August 1983. Extension of delivery dates sought by the PSU was not agreed to by the Naval Headquarters (HQ). The Naval HQ had also directed in June 1983 that the wage escalation claim should be restricted upto the contractual delivery dates. Contrary to the directions of the Naval HQ, wage escalation amounting to Rs.22.51 lakhs was paid to the PSU. An audit of the wage escalation paid revealed that the wage escalation admissible based on manhours booked upto the contractual delivery dates was only Rs.3.26 lakhs. The amount of wage escalation for manhours booked beyond the delivery dates was Rs.19.25 lakhs.

The Ministry stated in August 1989, that the wage escalation was linked to the escalation existing as on the contractual delivery date and it was applicable for actual manhours limited to 6.93 lakh manhours per SDB. It stated further that though the contract prevented the shipyard from claiming wage escalation at a rate above that prevail-

ing on the contractual delivery date, it did not limit the manhours only to those booked upto the contractual delivery date. The Ministry, therefore, maintained that the wage escalation had been correctly paid with reference to the manhours booked even beyond the contractual delivery date.

The argument of the Ministry was not tenable as wage escalation was contractually payable for the actual manhours booked upto the contractual delivery period only subject to the ceiling of 6.93 lakh manhours per SDB. The contract stipulated only the date of delivery of the SDBs. Had Naval HQ accepted the request of the PSU and agreed to the extended delivery schedule with consequential amendment of the contracted delivery schedule, wage escalation upto the freshly agreed dates would have been payable upto a ceiling of 6.93 lakh manhours per SDB. Since this was not done, the payment of Rs.19.25 lakhs was not only beyond the scope of the contract but clearly an unintended benefit and is recoverable from the PSU.

51. Engine modification on Kamorta class ships

Kamorta class ships acquired from abroad are fitted with diesel engines type X-1 and X-2; the main difference between the two types is that X-1 has 2000 hours of time between overhaul (TBO) whilst X-2 has 3000 hours. This increase in TBO had been achieved by modifying type X-1 engines by the manufacturer.

Naval Headquarters (HQ) understood in December 1979 from the specialists who had come to India for finalising certain aspects on the medium refit of Kamorta class ships that they were in a position to help the Navy in modifying the engines. The Naval HQ, therefore, approached the manufacturer in December 1979 to provide the navy with modification details to enable them to modify the type X-1 engines in service during the medium refit commencing from 1981. This modification could reduce the life-cycle

maintenance and increase the TBO and availability. The manufacturer responded in October 1981 that it may be possible to modify the engines to type X-3 or X-4 depending on their condition. Modification to type X-4 was considered advantageous since the TBO was 6000 hours. The Naval HQ, therefore, decided to modify all the 10 engines of Kamorta class ships to the level of type X-4 and a letter of intent was placed on the manufacturer in April 1982. A contract was signed in July 1983 for technical assistance in the modernisation of 10 engines during 1984-86. Under this main contract, two supplementary agreements were signed between July and September 1984 for the supply of technical documents (Rs.40 lakhs) and three modification kits (Rs.18.41 lakhs). Thereafter, the requirements were reviewed by Naval HQ and two further supplementary agreements concluded in September 1985 and December 1987 for the supply of three and four sets of modification kits respectively at a cost of Rs.63.28 lakhs. All the ten modification kits contracted, were received by the Navy between December 1985 and April 1989. With these kits, the Navy had modified four engines up to April 1989 and modification of three more engines is expected to be carried out during 1989-90.

However, the requirement of modification kits had undergone substantial changes with the decommissioning of the first Kamorta class ship in July 1986 and followed by others in June 1987 and December 1988. Two more are due for decommissioning by 1995. Although the Naval HQ, had indicated to Audit in April 1987 that they would review the decision for procurement of four modification kits with reference to phasing out plan of the ships, this was not done. Had this been done, there would have been no need to conclude a supplementary agreement in December 1987 for procurement of four modification kits at a cost of Rs.42.07 lakhs.

The Ministry of Defence (Ministry) stated in August 1989 that the ships were

being decommissioned but the engines were not being decommissioned. The engines have been merged with the stock and hence modification of engines would ensure availability of type X-4 engines for replacement on operational Kamortas. The contention of the Ministry is not tenable in view of the fact that only one spare engine was held even when all the Kamorta class ships were operational. Clearly, therefore, the merger of three more engines with stock lacks justification.

The case reveals the absence of timely review arrangements in the procurement process keeping in view the phasing out plans of the main asset resulting in an avoidable expenditure of Rs.42.07 lakhs.

52. Under-utilisation of mechanical runway sweepers

Mention was made in paragraph 15 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, regarding the unsatisfactory performance and under utilisation of mechanical runway sweepers (MRS) procured by the Air Force.

In August 1982, Naval Headquarters had proposed the procurement of four MRS, two each for the Naval air stations at Goa and Cochin. The proposal was based on vital flight safety considerations and to eliminate the manual sweeping of runways. With the induction of MRS, Naval HQ proposed to reduce the number of manual sweepers by 50 per cent.

In June 1983, Government sanctioned the procurement of three MRS, two for Goa and one for Cochin at a cost of Rs. 22.86 lakhs including Rs.2.40 lakhs in foreign exchange. Another sanction was accorded in April 1984 for the procurement of three more MRS at a cost of Rs.22.86 lakhs including Rs.2.62 lakhs in foreign exchange, for Naval air stations at Port Blair, Visakhapatnam and Kalyan. As the airfield at Kalyan did not come up, the MRS meant for Kalyan

was transferred to 'INS Kunjali'. The MRS were received and commissioned between October 1983 and November 1985.

The runway is required to be swept daily before the commencement of day and night flying and also in between the sorties as on required basis. However, the utilisation of these MRS was poor as evidenced by the area swept. The daily underutilisation was to the extent of 28.75, 55.86, 76.63 and 75.90 per cent at Visakhapatnam, Port Blair, Cochin and Goa respectively. There were several months when MRS were not used at all.

The underutilisation of the MRS was attributed variously by the Naval authorities to high down time, absence of drivers, heavy monsoon, inadequacy of repair facilities and limited technical know-how. It was seen, however, that at Cochin the utilisation was much below normal even in non-monsoon months.

No reduction was made in the labour engaged in runway sweeping at Port Blair and Cochin and the saving, by a 50 per cent reduction on labour amounting to Rs.10.35 lakhs during 1984 to March 1989 was not achieved.

The Ministry stated in September 1989 that the underutilisation had been due to heavy rains and unexpected unserviceabilities. It explained further that the bulk of the area including other intermediate places to be swept were non-cemented and were of macadam construction, resulting in loosening of gravel and stones thereby increasing the chances of foreign object damage and it was not advisable to use MRS on such surfaces. The Ministry added that to reduce unserviceabilities, sanction had been accorded in June 1989 to procure additional spares for three years.

The fact remained that the acquisition of MRS had not been evaluated appropriately with reference to known factors like the heavy monsoons and the surfaces to be swept. The Ministry also failed in ensuring the timely availability of adequate spares

leading to unserviceability of the MRS. This led to the underutilisation of the MRS and reduced levels of flight safety. Addition-

ally, the expected saving due to reduction of labour could not be achieved.

CHAPTER V

RESEARCH AND DEVELOPMENT ORGANISATION

53. Development of an integrated Air Defence System

The requirement of an integrated air defence system was projected by the Services as early as 1981-82. Air Headquarters (HQ) had projected a firm requirement for a certain number of the system in early 1983 for effective air defence against low level threats. The Navy also required the system for modern maritime operations. The system of this type had been successfully developed only by two countries. Ministry of Defence (Ministry) decided that import of the system was not feasible.

A proposal was made by the Defence Research and Development Organisation (DRDO) in March 1985 to take up work up to the project definition stage leading to the preparation of a detailed project report (DPR) for the design and development of an aircraft based technology demonstration airborne system (system) as a first stage of the programme of undertaking the indigenous development of the integrated air defence system (Main System).

The Air HQ had stated in 1987 that while it did not have the competence to judge the expressed confidence level of the DRDO or the reliability of the time-frame or cost estimates, the IAF position was that the fielding of the completed main system beyond a time-frame of ten years would not justify the development costs. The DRDO, however, stated that they had enough confidence to undertake the project with selective input of technology and foreign collaboration, within an acceptable time-frame.

The cost of the project was estimated at Rs.165 crores. (later revised to Rs.430 crores) The DRDO while seeking a financial sanction of Rs.8 crores for the project definition stage stated that conceptual design studies on the system had been com-

pleted and that the nucleus of a project management organisation had been positioned. The sanction was given in July 1985.

The main programme tasks of that stage as defined were:

- (a) to initiate lead-in-schemes to establish a data base for the main project;
- (b) to prepare a detailed project report for the whole project; and
- (c) to formulate a statement of case for the full project for approval by the Cabinet Committee on Political Affairs (CCPA).

The work was divided into 43 lead-in-schemes for defining the project and establishing the technology parameters and allotted to 15 work centres including two public sector undertakings (PSU). The work was planned to be completed within one year with the preparation of the DPR and a proposal for CCPA was to be ready by September 1985.

It was seen in examination by Audit that, of the 43 schemes, only 17 had been completed till June 1989 and remaining 26 schemes were scheduled to be completed by March 1990. The expenditure against the sanction on the various schemes upto June 1989 was Rs.14.82 crores. The proposal for the full scale development of the main system, which was to be submitted in September 1985 was submitted only in August 1988, that too without the preparation of a DPR.

The Ministry while admitting the delay, stated in September 1989 that the preparation of the DPR involved detailed design consideration and performance evaluation of the options which were not freely available and that the analysis involved high expenditure and therefore, it was to be taken up along with the full programme.

In the absence of the DPR, all the cost estimates were not realistic and were based on information given by the work centres. The elements of inflation and variations in the exchange rate were also not taken into account.

The Ministry admitted in September 1989 that the estimates were adhoc and could be made more definite after the project definition studies progressed. Even at that stage they added the costs would be only budgetary estimates. As such the Ministry had to take a view and go to the CCPA with rough estimates of costs, although the DPR was not ready.

Air HQ had stated in August 1987 that the undertaking of the programme, though essential for a modern integrated air defence system, would involve high risk and high cost for any country. This was more so, for India in the context of its existing level of scientific and technological development. It was seen by Audit that even for the project definition stage, the original cost of Rs.8 crores has gone up to Rs.14.82 crores upto June 1989 without completing the lead-in-schemes or preparing the DPR which were an integral part of this stage.

Although different monitoring levels were set up in the organisation they did not function as prescribed. According to the sanction of July 1985 the technological progress of the scheme was to be monitored by a Technology Management Board (TMB). The TMB was to meet at least once in every three months. It was seen that only two meetings of the TMB were held once in July 1985 and the other in May 1986. Similarly, the sanction provided for the constitution of a Programme Management Board (PMB) and a Project Management Board (PJB) for effective implementation of the project. While the PMB was to meet at least once in three months the PJB was to meet at least once in two months. The PMB and the PJB had, however, two meetings in 1985, two in 1986 and one in 1987. The Ministry, while confirming this (September 1989) stated that this

did not come in the way of effective monitoring.

When the DRDO put up a revised paper in July 1988 with rough estimates to the CCPA for the approval of the programme in principle for the development of the main system, the CCPA declined to approve it in August 1988. It however, approved that the department may continue with and complete the lead-in-schemes started under the project.

Clearly, the project had been sanctioned in July 1985 without an adequate appreciation of the full financial and technical implications. Thus, the expenditure of Rs.14.82 crores so far incurred on the project (sanctioned amount Rs.18 crores) would be unproductive, specially when the project was taken up based on the needs projected by the Services. The Ministry stated in September 1989 that the investment would not be unproductive since several spin off benefits would accrue in various scientific application areas.

54. Development of a composite sonar and tactical weapon control system

Submarines type 'A' were inducted into the Navy between August 1973 and December 1974. To meet the Navy's requirements, in terms of modern submarine warfare, Naval Headquarters decided in March 1985 to update by retrofitting indigenously developed sonar and fire control systems in these submarines from 1991 onwards.

In March 1986, the Defence Research and Development Organisation (DRDO) submitted a comprehensive proposal for developing a composite sonar and fire control system at an estimated cost of Rs.31.90 crores. This was approved by Government in August 1987 at an estimated cost of Rs 31.22 crores (FE Rs.12.02 crores). It was stipulated that the system be developed by November 1993.

It was seen in Audit that the project was not subjected to cost benefit analysis

before sanction. A cost comparison with equivalent systems available globally was also not done. Without this, it would not be possible to state the advantage of indigenous development in clear terms.

The Ministry stated, in October 1989 that the cost analysis was not possible considering the classified nature of such system.

It was also noticed that the expected cost of the sonar system to be developed indigenously (Rs 5 crores) was under-estimated. The costs of modifying the submarines for installing and commissioning the system would also have to be considered.

The Ministry stated, in October 1989, that in addition to Rs.5 crores for the sonar, the fire control system would cost Rs.1.2 crores. Ministry also stated that taking into account the changes in rupee value and exchange rates, the production cost might increase.

On the assumption that the project is successfully completed by November 1993, and is installed on the submarines from that date, the equipment will have a useful life of only five to six years against the approved life of 12-1/2 years for electronic equipment.

The Audit of the project also revealed that a training simulator, essential to optimise learning on such systems, has not been included in the project.

The Ministry stated in October 1989 that the development of a shore based simulator would be taken up at an appropriate time.

The Ministry had stated in November 1988 that the medium refit of the first submarine was scheduled for completion by 1994 and that the equipment was expected to be ready for fitment by this date. It added that the system under development could be used for fitment in any type of submarine which may be taken up for indigenous production.

In view of the sizeable investment in the project an interim appraisal of project

objectives as well as associated costs and benefits requires to be undertaken.

55. Foreclosure of research projects

(1) Rockets 'A' were acquired by the Navy in 1978 by import. At the instance of Naval Headquarters (HQ) the feasibility of indigenisation of these rockets was studied by a Defence Research Establishment (DRE) which submitted its report in April 1979. Based on this, the Naval HQ raised a draft Naval Staff Qualitative Requirement in July 1979 and it was decided in April 1980 to develop the rockets indigenously. In September 1980, the Naval HQ had indicated a tentative requirement of 5000 rockets every five years as war wastage reserves (WWR) and an annual practice requirement of 500 rockets.

In August 1981, the Ministry of Defence (Ministry) accorded sanction for the DRE to undertake the indigenisation of rocket 'A' with an expenditure ceiling of Rs.9.60 lakhs and its completion by February 1984. While the project was in progress, the Navy changed its requirement to only 180 rockets per annum which was not considered viable for indigenous production. The project was, therefore, closed in December 1984 after incurring an expenditure of Rs.2.75 lakhs including a foreign exchange element of Rs.0.35 lakh. The Ministry stated in September 1989 that the WWR requirement had to be met from abroad on the commissioning of ships that took place prior to the completion of the project and that the firm annual practice requirement was for 180 rockets. However, this should have been foreseen while projecting the requirement.

(2) In another case, Air Headquarters (HQ) projected an urgent requirement for the development of rocket 'B' in October 1974 which, too, was being imported. The feasibility of its development was examined and a study project was allotted to the DRE in April 1975. The Air HQ had stated that the requirement for this item would exist for 15 years.

Sanction was accorded by the Ministry in June 1976 for the DRE to undertake the development of the rocket within a cost ceiling of Rs.1.80 lakhs. After manufacture of prototypes, the technical trials were carried out in December 1976 and February 1977 and performance parameters found satisfactory. However, in September 1977, Air HQ decided to accept another item with the objective of standardising on one type of equipment. Accordingly, a decision was taken in September 1977 to close the project after incurring an expenditure of Rs.1.08 lakhs. The Ministry stated in September 1989 that the expenditure was not infructuous and that expertise had been gained in indigenisation of the particular equipment. This is not plausible since the objective of the R&D effort was not to gain expertise but to develop a prototype for production.

The case revealed waste of research and development effort due mainly to incorrect estimation of requirements. The consequent infructuous expenditure was Rs.3.83 lakhs.

56. Fabrication of sea water activated batteries

The Department of Electronics (DOE) had sponsored a project on the development of know-how for sea water activated batteries which could be used for torpedo propulsion. The know-how had been developed by the Madras Institute of Technology (MIT). Since the Navy would be the main user of this type of battery, the Naval Research and Development Panel (NRDP) recommended in September 1983 that the technology with all existing machinery and test equipment be transferred at a cost of Rs.4.26 lakhs to the Navy.

The batteries to be fabricated indigenously were intended not only to serve as substitutes for the existing batteries of the torpedoes which had been imported but also for use in the second generation torpedo to be designed. Accordingly, a proposal submitted by the Directorate of Naval Research

and Development (DNRD) in December 1983 to entrust the project to the Naval Science and Technological Laboratory (NSTL) was approved by the Ministry of Defence (Ministry) in July 1984. The work was to be completed at a cost of Rs. 36 lakhs by July 1987.

The Steering committee reviewed the status of the project in October 1984 and May 1985 and decided that NSTL should endeavour to develop a battery for a specific system instead of a generalised version and, for that purpose, torpedo 'B' was the most appropriate, being the latest acquisition. Therefore, in May 1985, the objective of the project was changed to development of batteries to torpedo 'B'. Two batteries of torpedo 'B' costing Rs. 2.42 lakhs were accordingly supplied to NSTL by the Navy in 1985.

In July 1986, Naval Headquarters (HQ) proposed import of 64 batteries for torpedo 'A' for Rs.51.81 lakhs for replacing the batteries which had outlived their shelf life. In October 1986, Naval HQ stated that a requirement existed for battery 'A' and requested NSTL to identify a production agency because when they approached Directorate of Production and Inspection, Navy (DPIN) for indigenous development they had asked about the production agency. Director NSTL stated, in the steering Committee meeting, in October 1986, that a decision had been taken long back that for underwater battery requirements, NSTL would act as the nodal agency and therefore Navy should have projected the requirement to NSTL instead of approaching DPIN. The Steering Committee decided that NSTL should develop first batteries for torpedo 'A' and then for torpedo 'B'. Government's sanction for the import of 64 batteries for torpedo 'A' was also obtained in February 1987 and a contract was concluded with a foreign firm in February 1987. These were received between 1987 and June 1989.

An adequate number of batteries was available with the Navy for the operation of

the torpedoes. With the import of 64 batteries in 1987, the Naval HQ should have informed NSTL for foreclosure of the project. This was not done. NSTL went ahead with the development of battery for torpedo 'A' and the project was completed successfully in July 1989 by incurring an expenditure of Rs.36.83 lakhs.

Had Naval HQ taken timely action to inform NSTL for the foreclosure of the project, a significant portion of the expenditure on research and development could have been avoided.

Meanwhile in 1987, the Department of Defence Production and Supplies identified a private firm 'Z' for indigenous development and manufacture of battery for torpedo 'B' and placed orders in June 1988 for the supply of 30 batteries for Rs.78.25 lakhs. The prototypes were to be delivered by December 1989.

The Ministry stated in October 1989 that the accent of work was shifted from development of battery for torpedo 'B' to that of 'A' at the behest of users and NSTL was not aware of any imports by Navy.

57. Procurement of speech secrecy equipment for the Services

Navy

Since the seventies, the Navy had felt the necessity for securing speech circuits to provide real time information and also for safeguarding security of information. The development of a speech secrecy equipment 'X' by a Defence Research and Development Laboratory (R&D Lab) in 1976 for this purpose was to fulfil this longfelt requirement. Subsequently, based on an approval by the Naval Equipment Policy committee in July 1976 for the introduction of a speech secrecy equipment, Naval Headquarters (HQ) had sought sanction of the Ministry of Defence (Ministry) in August 1976 for procurement of equipment 'X', from the R&D Lab for use over telephone lines of important subscribers. Ministry's sanction to this procurement was accorded in

February 1977 at a cost of Rs.36.10 lakhs including Rs.12.82 lakhs in foreign exchange. In April 1978, Naval HQ placed an indent on the R&D Lab for 124 sets of equipment 'X'. A sum of Rs.33.88 lakhs had been paid upto December 1983. The Ministry stated in September 1988 that the indenting action was delayed as the Navy wanted to carry out trials of the equipment prior to the placement of an order. The sets were to be supplied by the R&D Lab in 1980. However, due to a slippage in the production schedule attributed to the delayed receipt of imported items, 19 sets were supplied in May 1983 and 25 sets in 1987. Although, advice about the inspection and acceptance of 79 sets out of the remaining 80 sets by the Defence Inspector was received in January 1988, the sets were collected by the Navy only by September 1988. Notwithstanding the delayed supply, equipment 'X' were found to have severe limitations during confirmatory users' trials. The Ministry stated in September 1988 that the performance of the production model was satisfactory during user trials in 1981. However, when supply commenced in May 1983 and the sets were put to regular use, their performance became erratic. The defect rectification carried out by the R&D Lab on a number of occasions could not achieve any acceptable results on the sets already delivered. The Ministry further stated that in the case of 79 sets collected in September 1988 a proposal to request the R&D Lab to reconfigure the equipment to improve the performance to suit users requirement prior to putting the new sets to use was under consideration.

In April 1987, Naval HQ approached the Ministry for the import of 12 digital voice scramblers similar to equipment 'X', from the foreign firm to provide secure telephone links between Naval HQ and Command HQ as equipment 'X' supplied till then by the R&D Lab had various limitations. This was approved by the Ministry and sanction for the import was accorded in July 1987 at a

cost of Rs.5 lakhs. The sets were received in September 1987.

Army

Army HQ had sought sanction of the Ministry in February 1974 for the procurement of equipment 'X' from the same R&D Lab. The Ministry's sanction was accorded in June 1976 at a cost of Rs.66 lakhs including Rs.16 lakhs in foreign exchange. The sanctioned cost was subsequently enhanced to Rs.66.80 lakhs in June 1982. The Ministry stated in August 1989 that the cost enhancement was due to certain add-on-units. An indent was placed by Army HQ in January 1977 on the R&D Lab for procurement of 200 sets of equipment 'X' to be supplied by March 1978 to an ordnance depot.

User trials on the equipment were conducted during December 1980 to January 1981 and bulk production clearance was given to the R&D Lab in June 1981. The Ministry attributed the delay in giving clearance for bulk production due to certain modifications. The first batch of eight sets was supplied by the R&D Lab in August 1984 and the remaining sets were supplied during November 1984 to July 1988.

During user trials and also after induction, the equipment was found to have severe limitations and their performance was highly fault prone and unsatisfactory. In the meantime, the Army HQ had placed another indent on the R&D Lab in June 1979 for the supply of 242 sets of this equipment at a cost of Rs.58.56 lakhs without knowing the results of the user trials of the earlier version. Army HQ suggested in September 1982 the cancellation of this indent in view of the poor performance of the earlier sets, noticed during user trials. Accordingly the indent was cancelled in February 1983 without any financial implications.

As the performance of these equipment procured for the Navy was also erratic, Naval HQ sought, in May 1988, the views and evaluated performance data from Army HQ in respect of the sets procured for

the Army. Army HQ indicated in June 1988 that the performance of the equipment was unsatisfactory and the equipment was highly fault prone and had serious drawbacks. The total expenditure according to the R&D Lab for the supply of 200 sets of the equipment worked out to Rs.65.97 lakhs.

The Ministry stated in August 1989 that during the trials, the performance of the equipment was satisfactory as per specifications except where the quality of the circuits (lines) used were not of the required grade. No defects were reported by the Navy or the Army to the R&D Lab. It added that this was the first speech secrecy equipment developed and with the experience gained, better equipment were being designed. Steps would be taken to cut down the development and production cycle to prevent the equipment becoming outdated.

Air Force

Ministry's sanction was accorded in December 1976 for the procurement of 100 sets of equipment 'X' at a cost of Rs.23 lakhs. Air HQ placed an indent in April 1977 for the procurement of 100 sets on the same R&D Lab. The supply of the sets was completed by January 1986. Air HQ stated in December 1988 that the sets were functioning satisfactorily.

The case shows that :

- an urgent requirement of 124 sets of speech secrecy equipment for the Navy, 200 sets for the Army and 100 sets for the Air Force projected between 1976 and 1978 materialised fully only between 1986 and 1988 involving over 10 years of development and production.
- the sets procured at a cost of Rs.52.4 lakhs for the Navy and Rs.65.97 lakhs for the Army continue to have several limitations and their performance had been erratic and unsatisfactory.
- the procedure followed for procurement were defective in as much as

the equipment were not proven and their suitability not fully established through extensive user trials.

the satisfactory performance of the sets procured by the Air Force would

merit scrutiny in order to identify the causes for the drawbacks of the sets for Navy and the Army.

Baldev Rai

NEW DELHI

Dated the

16 MAR 1990

(BALDEV RAI)
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Comptroller and Auditor General of India

NEW DELHI

Dated the

17 MAR 1990

