REPORT OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA

FOR THE YEAR ENDED 31 MARCH 1990

NO. 9 OF 1991

UNION GOVERNMENT

(DEFENCE SERVICES - AIR FORCE AND NAVY)

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PREFATORY REMARKS

This Report for the year ended 31 March 1990 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, interalia, reviews on:

Air Force

(a) Air Defence Ground Environment system
(b) Training simulators.

Navy

(c) Induction of an aircraft
(d) Acquisition and maintenance of certain vessels
(e) Modernisation of INS Vikrant
(f) Naval Armament Depots
(g) Naval Dockyard, Bombay
(h) Naval Hydrographic Department

3. The cases mentioned in this Report are among those which came to notice in the course of audit during the year 1989-90 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 1989-90 have also been included, wherever considered necessary.

ERRATA

Page	Column	Line	For	Read
54	2	Table	refit	refits
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85	2	1	non-availibility	non-availability

The Audit Report for the year ended 31 March 1990 contains 44 paragraphs including 8 reviews. The points highlighted in the Report are given below:

Ministry of Defence

I. Development and production of a trainer aircraft

Delay in the development and production of trainer version for aircraft 'A' resulted in an increase in both the development cost from Rs.4.16 crores to Rs.18 crores, and the cost of production of the two trainer aircraft from Rs.2 crores to Rs.4.75 crores. Moreover, in view of the unsatisfactory performance of aircraft 'A', the Air Force had been insisting on its premature withdrawal and the foreclosure of the trainer aircraft project. The project was, however, allowed to continue. As the total fleet of aircraft 'A' is now expected to be withdrawn by 1991-92, the entire expenditure of Rs.22.75 crores incurred would be infructuous.

(Paragraph 2)

Air Force

II. Air Defence Ground Environment System

The Air Defence Ground Environment System approved in 1970 was intended to provide efficient and reliable defence against air attacks. An audit appraisal of the implementation of the project indicated time overruns of over 10 years as well as increase in the financial outlay from the original estimate of Rs.227.52 crores to Rs.1,000 crores. None of the physical targets envisaged could be realised within the stipulated time schedule particularly due to serious gaps and deficiencies in indigenous design/development/production and installation capabilities. Partial accomplishment of the planned objectives necessitated expenditure of Rs.125.69 crores in resorting to interim measures. About 30.88 per cent of the total requirement of communication links of the plan was yet to be made operational. The full range of repair facilities to provide maintenance cover to the systems inducted under the plan had not been established so far. Regional work shops were still to be established resulting in avoidable expenditure of Rs.51 lakhs due to deployment of technical manpower at the field formations and transporting of equipments.

(Paragraph 4)

III. Training simulators

An audit review of the installation and utilisation of some of the training simulators in the Air Force revealed, inter alia, that two simulators costing Rs.11.49 crores had remained non-functional from July 1985 and March 1987 respectively due to unstable power supply. This resulted in shortfall of 82.63 per cent in meeting the training needs in one case and in the other case, pilots had to carry out additional ground training. It was also observed that an investment of Rs.5.07 crores on indigenous development and installation of another simulator for a specific aircraft proved

at a cost of Rs.23.18 lakhs. Even thereafter it could not be made fully operational.

There was also a shortfall in the utilisation of the dockyard dredging fleet. Moreover, the maintenance of the dredgers was cost prohibitive.

(Paragraph 22)

XIII. Naval Hydrographic Department

The Naval Hydrographic Department undertakes hydrographic surveys of the Indian coasts and harbours and prepares nautical charts and documents required for navigational and other purposes. An audit of the Naval Hydrographic Department revealed time overruns extending upto 77 months and cost overruns aggregating Rs.15 crores in the construction of three survey ships and four survey crafts. There was also a steep increase in the cost of construction of two identical survey vessels from Rs.14 crores for a ship delivered in August 1985 to Rs.45.33 crores for a ship delivered in January 1990 by the Garden Reach Shipbuilders and Engineers. There were serious backlogs in survey programmes.

(Paragraph 23)

XIV. Avoidable import of airborne communication equipment

Import of eight sets of airborne communication equipment by the Navy at a cost of Rs.25.72 lakhs in November 1987 on grounds of delay in manufacture of the equipment by a public sector undertaking was avoidable as the undertaking had in fact supplied 25 sets during the relevant period.

(Paragraph 26)

XV. Injudicious procurement of communication sets

Purchases of a large number of communication equipment for naval ships and communication centres had been made by Navy from various public sector undertakings. Instances of unnecessary procurement and avoidable payment of escalation charges were noticed in audit. In one case, nine communication sets costing Rs.1.01 crores received between August 1984 and January 1986 were meant to replace existing ones only between February 1997 and July 1998 indicating premature procurement. In another case, procurement of 12 sets costing Rs.1.22 crores was unnecessary and avoidable as the ships for which the sets were procured were due for decommissioning before the receipt of the sets. In the third instance, delay in placing supply orders for communication sets resulted in an avoidable extra expenditure of Rs.15 lakhs.

(Paragraph 30)

XVI. Extra expenditure due to delay in execution of contract

The offer of a firm for consultancy in the field of specific design study for an on going ship-building/modernisation programme was valid upto March 1987. Due to procedural delays in finalising the terms and conditions, the contract could be concluded only in July 1987. The delay in execution of the contract resulted in an extra expenditure of Rs.5.80 lakhs.

(Paragraph 32)

XVII. Extra expenditure on procurement of an equipment

Procedural delays in concluding the contract for purchase of an equipment resulted in extra expenditure of Rs.16.48 lakhs in foreign exchange.

(Paragraph 35)

XVIII. Laying off an operational vessel for over 13 years

A special purpose vessel, acquired at a cost of Rs.6.66 crores, remained non-operational for over 13 years for want of spares. The medium refit of the vessel commenced in 1977 and had to be suspended in 1981 due to non-availability of spares. Against a contract concluded in January 1985 for supply of the required set of spares, only part supply had been made till October 1990. The medium refit, restarted in March 1985, is now expected to be completed by the end of 1990.

(Paragraph 36)

Research and Development

XIX. Setting up of lake test facility for torpedoes

A torpedo test facility for test launch and recovery of torpedoes was sanctioned in February 1982 at a cost of Rs.5.90 crores, later revised in January 1984 to Rs.7.47 crores. The facility, expected to be completed in February 1987, is now expected to be completed by March 1991 at an estimated cost of Rs.7.84 crores. A number of items of imported equipment worth Rs.1.09 crores received from June 1984 onwards were lying idle pending completion of the facility. Further, owing to delay in setting up the facility, a small torpedo launch and recovery vessel had to be acquired at a cost of Rs.1.10 crores as an interim measure. This vessel cannot be transported to the lake owing to its size.

(Paragraph 41)

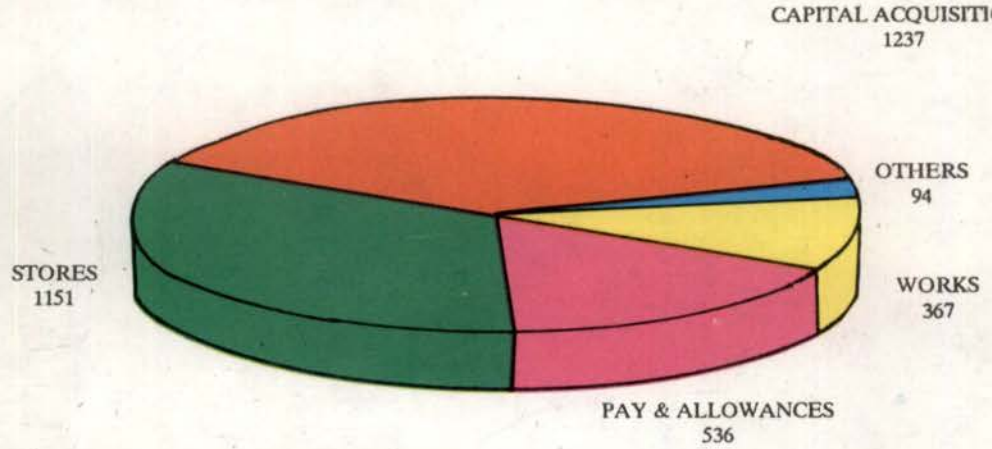
CHAPTER - I

FINANCIAL ASPECTS

1. Financial aspects

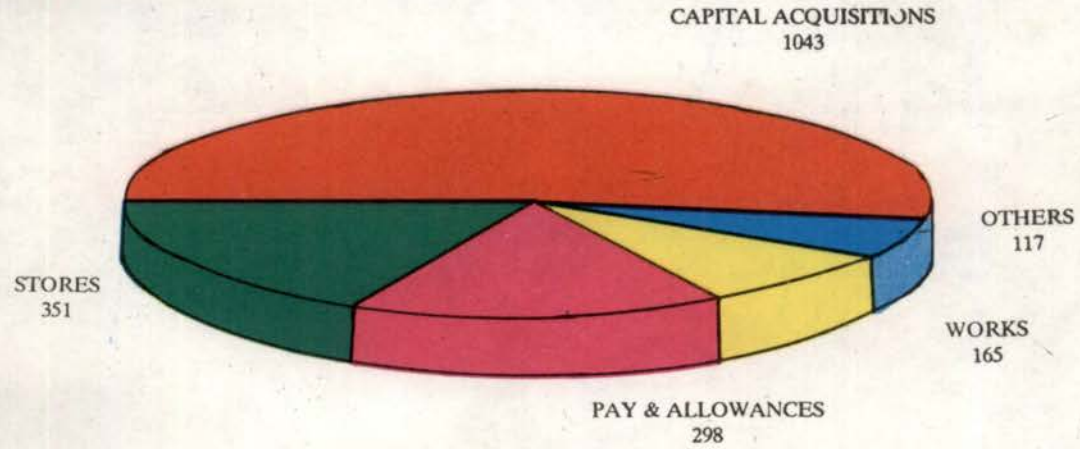
1.1 During 1989-90, there was an increase in expenditure on the Defence Services as compared to the previous year. While expenditure during 1988-89 was Rs. 13719 crores, the expenditure during 1989-90 was Rs. 14889.31 crores showing an increase of nine per cent. The share of expenditure of the Air Force and the Navy in the total Defence expenditure was 23 and 13 per cent respectively during 1989-90. The actual expenditure on the Air Force and the Navy during 1989-90 was Rs. 3385 crores and Rs. 1974 crores respectively as compared to Rs. 3066 crores and Rs. 1823 crores in 1988-89.

1.2 The proportion of outlay on the Air Force on capital acquisition, stores, pay and allowances and civil works for the year 1989-90 was as under:



(Figures in crores of Rupees)

1.3 In respect of Navy the proportion of the outlay on similar heads was as under:



(Figures in crores of Rupees)

1.4 The Defence Research and Development Organisation through its four laboratories dedicated to the Air Force and three to the Navy, takes up projects for meeting specific requirements of these services. Projects such as development of light combat aircraft, advance light helicopter, pilotless target aircraft, sonars and torpedoes for submarines were at various stages of development.

1.5 A test check of the transactions and review of some selected projects and activities of the Air Force and Navy during the year revealed cases of extra expenditure in the procurement of stores and equipment due to administrative delays and deficiencies in implementation, lacuna in the existing procedure of procurement, non-adherence to laid down rules and procedures, avoidable import of equipment resulting in the outflow of foreign exchange, lack of synchronisation between the receipt of machinery/ equipment and completion of civil works, as also instances of extra contractual payments.

CHAPTER - II

MINISTRY OF DEFENCE

2. Development and production of a trainer aircraft

A proposal for the development of a trainer version of aircraft 'A' within a time frame of 54 months at an estimated cost of Rs.4.16 crores, put up by Hindustan Aeronautics Limited (HAL) in June 1975, was approved by the Government in February 1976. In a meeting in November 1979 Air Headquarters (HQ) had stated that aircraft 'A' should be phased out starting from 1985. Government sanctioned in April 1980, procurement of 12 trainer aircraft from the HAL at a cost of Rs.1 crore each. The order was placed in August 1980. The aircraft were to be delivered at the rate of six each during 1982-83 and 1983-84. There had, however, been delays in the development of the trainer aircraft and resultant increase in development costs. This had been commented upon in paragraph 8 of the Report of the Comptroller and Auditor General of India, Union Government (Defence Services) for the year 1983-84. The Ministry of Defence (Ministry) had stated in October 1984 that the foreclosure of the trainer aircraft project was under consideration. The project, however, was continued on the plea that the trainer aircraft would be required not only as a specific to type trainer but also for the Operational Conversion Units (OCUs) as a link trainer. A further review of the progress of the project brought out the following features.

The first prototype of the trainer aircraft, due in December 1980, was actually flown in September 1982, but it crashed in December 1982 after carrying out 14 sorties.

In a meeting in March 1983, the Indian Air Force (IAF) pointed out that the OCU training was meant for new entrants after they had been trained on a basic trainer aircraft. These pilots required an aircraft with proven safety records and the trainer aircraft under development did not fit into that category. Moreover, there had already been a hike in development costs as well as considerable delay. The IAF recommended the short-closure of the development project. The IAF had added that while there would be infructuous expenditure in foreclosing the trainer aircraft project, the overall savings in men and material would be of a substantially higher order which could not be ignored. It was decided in March 1983 in the same meeting that while development work should continue upto December 1983, by which time a decision on the foreclosure of the project would be taken, HAL should not procure any fresh materials for production of trainer aircraft.

The trainer aircraft project was again reviewed in October 1984. It was brought out then, that the redundancy in the event of the short-closure of the project would be to the tune of Rs.22 crores. It was decided in October 1984 that a final decision could be taken after HAL had completed 50 development sorties by December 1984 and furnished their evaluation report. The Ministry stated in October 1990 that the decision had been taken after taking into consid-

eration the effort and the finances that had gone into the project as well as the status of the project at that time.

In February 1985, it was decided that a committee would be constituted to examine the possibility of continuing with the trainer aircraft production programme. The committee recommended in June 1985 that clearance might be given for the production of the aircraft on the basis of tests carried out till then and assurance given by the HAL with regard to other shortcomings. Government sanctioned in August 1985, the procurement of trainer aircraft from HAL, but reduced the quantity from twelve to eight. The sanction stipulated that the development cost of the trainer aircraft beyond Rs.11.25 crores would be met by HAL from their Research and Development reserves. Amendment to the earlier order of August 1980 was issued by the Air HQ in March 1986 reducing the quantity on order to eight. "Stop order" imposed in March 1983 was also lifted in July 1986.

The Navy had also projected a requirement of eight trainer aircraft and obtained a Government sanction in November 1982 to procure them at a cost of Rs.19.51 crores. An order was placed by the Navy on HAL in November 1985 with a delivery schedule of six aircraft in 1988-89 and two aircraft in 1989-90. Against this order, an amount of Rs.9 crores as "on account payment" was paid to HAL in March 1986.

In 1986, Air HQ once again suggested premature withdrawal of the combat aircraft 'A'. They also wanted cancellation of the orders for the trainer aircraft as it was only a type trainer and once the aircraft 'A' themselves were withdrawn the trainers would not be necessary. Subsequently, it was decided that the Ministry would ask HAL to furnish details regarding development cost and redundancy charges in case a decision was taken to scrap the order. In view of this, go-ahead sanction accorded in July 1986 was again held in abeyance in January 1987.

The IAF started phasing out aircraft 'A' from 1987 and in 1988 reiterated the premature withdrawal of aircraft 'A' and the foreclosure of the trainer aircraft project. The Navy too indicated in June 1988 that they would not require the trainer aircraft in case the IAF was not going in for them. HAL pointed out in June 1988 that nearly 400 men were working on the trainer aircraft project and its foreclosure would create idle capacity in the factory apart from redundancies that would arise on account of materials already procured.

The cost of development of trainer aircraft was enhanced to Rs.18 crores in January 1988 from Rs.4.16 crores sanctioned in February 1976. It was decided in October 1988 that a detailed paper would be prepared regarding premature withdrawal of aircraft 'A' and foreclosure of trainer aircraft project for submission to the Government. However, no such paper was prepared. The Ministry stated in October 1990 that the matter was considered in a meeting where it was decided that though aircraft 'A' would not be withdrawn before 1991-92, the trainer aircraft would not be required by the IAF.

So far, HAL has delivered only two trainer aircraft to IAF, one in December 1987 and the other in April 1988, for which they claimed Rs.4.75 crores as against Rs.1 crore each as quoted in the order. The first aircraft delivered was a production aircraft while the other a prototype modified to pro-

duction standard. No aircraft had been delivered to the Navy.

The first trainer aircraft was inducted in squadron service in December 1987 while the second was inducted in April 1988. The utilisation rate achieved by these trainer aircraft was poor as it ranged from 0.15 to 5.30 hours per month during January 1988 to May 1990. The Ministry stated that the trainer aircraft was to be developed as a type trainer and had also initially been proposed to be used for OCUs. It added that Air HQ had estimated in January 1980 that the curtailed force level of squadrons of aircraft 'A' would continue till 1991-92. Therefore, Air HQ had proposed procurement of 12 trainer aircraft on the basis of HAL's projection that it was possible to commence supply of the trainers in 1982-83 and complete its delivery by 1984-85.

To sum up:

- The inordinate delay in the development and production of a trainer aircraft had resulted in enormous increase in costs. While the cost of development increased from Rs.4.16 crores to Rs.18 crores, the cost of production of two trainer aircraft went upto Rs.4.75 crores from Rs.1 crore each.

- In view of the serious drawbacks like high accident rate and poor utilisation of combat aircraft 'A', IAF had been repeatedly insisting from 1983 onwards, on its premature withdrawal and foreclosure of the trainer aircraft project. The project, however, was allowed to continue. The IAF has started phasing out the combat aircraft 'A' from 1987 onwards and the entire fleet is expected to be withdrawn by 1991-92. As such, the chances of optimum utilisation of the two trainer aircraft delivered by HAL are remote. The utility of the trainer aircraft at OCUs has also been ruled out. Thus, the entire expenditure of Rs.22.75 crores (Rs.18 crores for development and Rs.4.75 crores being cost of two aircraft) incurred would be infructuous.

- An amount of Rs.9 crores advanced by the Navy in March 1986 continued to remain with HAL without any benefit accruing to the Navy. The amount of advance together with interest thereon have yet to be recovered from HAL.

3. Delay in the acquisition of submarine rescue vessel

The Indian Navy had been operating one submarine rescue vessel (SRV) from 1971 for providing elementary rescue facilities to submariners. Its life was ten years.

The process of selection of a suitable SRV was set in motion by Naval Headquarters (HQ) and Ministry of Defence (Ministry) in 1977. In March 1979, the scheme for the acquisition of submarine rescue system was accepted by the Government and a provision of Rs.12 crores was made in the Defence Plan 1979-84. A provision of Rs.60 crores was then made in the Defence Plan 1980-85. During May/June 1980, Naval HQ shortlisted two offers from 22 different types of offers received from foreign firms. These offers, valid upto September 1981, were for Rs.32.68 crores and Rs.50.60 crores for the supply of two rescue systems. But since the systems shortlisted were different from the staff requirement partially framed by Naval

There had been a delay of 2-11 years and 5-9 years in the induction of radars type 'A' and 'B' respectively against their original induction time schedule. Not a single radar type 'E' had been supplied so far though its development was started as far back as 1976. In the meantime, its development cost had gone up substantially.

In the absence of radars type 'B' and 'E' being available from indigenous sources in sufficient quantities, the IAF had imported certain radars at a total cost of Rs.125.69 crores as an interim measure. On the other hand, radars type 'D' had to be retained in service beyond their stipulated useful life.

The communication links made operational so far involved a delay ranging between six years and ten years against the planned induction schedule. About 30.88 per cent of the total requirement of the plan was yet to be made operational (October 1990).

Full range of repair facilities to provide maintenance cover to the systems inducted under the plan had not been established in the main workshop so far, though it started functioning as far back as 1976. Regional workshops have not yet been established and consequently an avoidable expenditure of Rs.51 lakhs had to be incurred during 1987-88 to 1989-90 towards deployment of manpower and transportation of equipment etc. Repairable items worth Rs.2.3 crores remained unrepaired over the years.

4.5 Plan outline

The ADGES Plan was to be executed in four phases involving an overall financial outlay of Rs.227.52 crores with a foreign exchange (FE) element of Rs.81 crores besides recurring expenditure of Rs.62.86 crores. The overall expenditure was to be spread over ten years and the plan was to be completed by 1979. Simultaneously, sanction was also to be obtained for setting up of a production agency to meet the indigenous production requirements of the ADGES plan. In addition, while keeping the entire responsibility of the system in Indian hands, it was to be ensured that technology used was upto date and optimum utilisation of indigenous design knowhow and equipment achieved. Basic and major repair facilities required to provide maintenance cover to the system under the plan were to be organised. Similarly, training aids available with the Air Force were to be augmented to meet the training requirements of ADGES plan.

4.6 Implementation of projects

The physical progress made in respect of various elements of the ADGES Plan so far (November 1990) was as follows:

4.6.1 Radar type 'A'

Of the total requirement envisaged under the ADGES Plan, fifty per cent of these were for new induction and the remaining was intended to replace the existing obsolete radars. For this purpose, a radar was first purchased from a foreign manufacturer for Rs.2.54 crores in accordance with an agreement concluded in February 1971. Further production of this radar was to be undertaken by a Public Sector Undertaking

'X' (PSU 'X'). The imported radar was commissioned and handed over to the Air Force for operational use in April 1976. Orders for the remaining radars were placed on PSU 'X' by the Ministry of Defence (Ministry) during March 1975 to March 1987. Their delivery was due between September 1975 and March 198' All the radars were supplied by the PSU 'X' to RCPO between June 1977 and March 1989. However, radars only to the extent of 58 percent of the total requirement were made available to the Air Force for operational exploitation during January 1981 to January 1990. The remaining radars were expected to be handed over to the Air Force progressively by December 1991. The actual time taken in installation of individual radar ranged between 25 and 48 months against the standard period of 23 months. Consequently, the planned date of handing over the radar to the Air Force had to be revised on several occasions from 1973 to 1989.

Based on the scales for depot and unit spares for radar type 'A' finalised by Air HQ in April 1986, the cost of requirement of additional unit spares for four radars was assessed at Rs.66.26 lakhs at 1984 price level. The requirement was necessitated due to inadequacy of the unit spares provisioned earlier based on the recommendations of the foreign manufacturer. The assessment of cost was based on the indication given by PSU 'X'. Placement of order on PSU 'X' in May 1986 was also recommended. The order for additional unit pack spares was, however, placed on the PSU 'X' in October 1988 for one radar only at a cost of Rs.89.90 lakhs. Orders for unit spares for the remaining three radars were placed in January 1989 at a total cost of Rs.265.17 lakhs. Apparently, delay in finalisation of scales and placement of order for the purchase of spares for four radars resulted in avoidable expenditure to the extent of Rs.288.85 lakhs, besides affecting the maintenance and operation of the system.

4.6.2 Radar type 'B'

Certain number of units of this radar, some in mobile configuration and some in semi-static configuration, were to be inducted to replace the existing ageing radar type 'D'. The development of this radar was organised by PSU 'X' in pursuance of an agreement concluded with the same foreign supplier as radar 'A' in February 1971 at a cost of Rs.45.29 lakhs. A letter of intent (LOI) for its development was placed on the PSU 'X' in April 1971. The development was to be completed by October 1974 but was actually completed in March 1978. The technical evaluation by the users was completed in May 1980. The first radar was delivered in June 1982 i.e. nearly three years after the original date of completion of the ADGES plan. The design and development cost of the prototype of this radar was Rs.355.58 lakhs.

The LOI for procuring the radar type 'B' partially was placed on PSU 'X' during September 1978 to February 1982. Purchase orders were placed during April 1982 to November 1985 with the delivery scheduled to be completed by November 1985. These radars were, however, supplied by the PSU progressively between June 1982 and October 1986 and all except one were handed over to the Air Force during February 1984 to April 1988 for operational use. The Ministry stated that the installation of the radar had got delayed due to unforeseen difficulties in the selection of sites and execution of civil works. The remaining radar which was in storage with

the PSU since March 1986 has now been rescheduled for commissioning in 1991.

Due to nonavailability of indigenous radar type 'B', the operation of the radars type 'D' whose stipulated useful life was over by 1984, had to be retained in service. These are now likely to be phased out by 1991.

In 1984, it was decided that radar type 'B' would be replaced with radar type 'C' which was an improved version of radar type 'B'. A contract was concluded with the same foreign manufacturer in the same year for supply of one radar type 'C' and necessary transfer of technology for its subsequent indigenous manufacture at a total cost of Rs.9.40 crores.

The imported radar type 'C' was handed over to the Air Force in January 1988 after the final acceptance report by the users in May 1987. Purchase orders for manufacture and supply of certain number of type 'C' radars were placed on the PSU between September 1986 and March 1990 at a total cost of Rs.83.94 crores and were to be supplied between September 1986 and May 1991. Orders for the remaining radars have not yet been placed (November 1990). Two radars of type 'C' supplied by PSU 'X' were under installation.

The imported type 'C' radar installed and commissioned in January 1988 had certain inherent design deficiencies, inadequacies, and unreliability in its performance. Resultantly, its deployment in frontline areas in place of radar type 'B' was held in abeyance. At the same time, it was decided to operate this radar in mobile configuration at certain locations instead of in semi-static configuration as had been contemplated initially. This arrangement would entail an additional expenditure of Rs.2.20 crores on account of containerisation of data handling system which is stated to be scheduled for completion by mid 1991. According to the Ministry, installation of the radar in mobile configuration was with a view to change their locations subsequently after stabilisation of its performance. The Ministry added that further orders on the PSU would be placed after clearance by Air HQ subject to satisfactory performance of the first, second and third radars.

Due to the non-availability of sufficient number of radars type 'B', the Air Force had to import certain radars type 'F' at a total cost of approximately Rs.24 crores in 1985 as an interim measure. The imported radars could not, however, be utilised as certain critical sub systems were not procured along with the radars. These items were subsequently arranged from indigenous sources at a total cost of Rs.6.79 crores. In spite of the fact that these radars were commissioned at the operating units from July 1986 to March 1987, only 50 percent of the radars could be made operational so far (April 1990). According to the Ministry, the radars could be operationally exploited without the additional items, though not with the same functional convenience.

Further, taking into account the limited life of the turbo generators received alongwith these radars, Air HQ imposed in December 1986 severe restrictions on their utilisation. The restricted utilisation was considered grossly inadequate to meet all the air defence commitments of the units. Lastly, no decision had been taken so far to set up repair facilities for these radars and this was likely to put severe constraints on the operational exploitation of these radars.

4.6.3 Radar type 'E'

Certain units of this radar were originally planned for induction by 1977 through indigenous production. While the first version of this radar was intended to meet the requirements of the Army the second version was for the Air Force. The development of this radar was sanctioned in July 1976 at an estimated cost of Rs.142.50 lakhs (FE Rs.84 lakhs) and its development was assigned to a Research and Development Establishment. The development cost was increased to Rs.5.79 crores (including FE element of Rs.3.84 crores) in July 1983. PSU 'X' was nominated as the production agency. The system engineering of the radar was decided to be assigned to RCPO. The radar was planned for induction from 1984 onwards.

The development of the radar had been commented upon in Paragraph 10 of the Report of the Comptroller and Auditor General of India for the year 1984-85, Union Government - (Defence Services). The Public Accounts Committee expressed their dis-satisfaction on the total failure of the Project Management System in ensuring the completion of the project within the stipulated time and cost schedule. The Committee recommended in their seventy sixth Report (1986-87), Eighth Lok Sabha and hundred and seventieth Report (1989-90), Eighth Lok Sabha, effective monitoring of production activities to ensure availability of the radar to the Air Force within the shortest possible time and to avoid further slippages. An expenditure of Rs.5.28 crores (Rs.3.61 crores in FE) had been incurred on the development of this radar (June 1989).

Non-availability of sufficient radars from indigenous efforts led to import of radars at a cost of Rs.101.69 crores between 1973 and 1988-89 besides retention in service of radars which had been due for phasing out by 1984 due to their operational limitations.

The Ministry stated in October 1990 that the PSU had completed its first production model and the same had been subjected to various stages of user trials. It added that the delay in development of the radar was due to constraints in indigenous capability and expertise to develop and manufacture such contemporary systems. It further added that the design and development agency had alone taken six years to evolve a functional and acceptable prototype system.

4.6.4 Control and Reporting Centres (CRCs)

In July 1986, Air HQ formulated and issued an Air Staff Requirement for CRCs. Taking into account the complexities of the technical work involved, a low level radar networking group was sanctioned in November 1986. The group was to plan, design and set up an overall air defence net work at a total financial outlay of Rs. 25 crores. The entire project was to be completed within a period of three years. Approval was sought for time and cost overrun to the extent of 12 months and Rs.7 crores respectively in August 1989 and approved in June 1990. As per projections available in December 1989, the first CRC is likely to be handed over by December 1991.

4.6.5 Communication links

The existing communication systems available with the Air Force were not adequate to meet its operational requirements. The communication network under the plan was initially con-

templated to be executed in stages during the period from July 1973 to April 1975. Subsequently, this was revised to be engineered in six stages viz, stage I to IV and stage II extension and stage III extension. Stages I, II and III were handed over to the Air Force in July 1979, 1983-84 and 1984 involving delays of 6 years, 10 years and 9 years respectively against the planned induction schedule. Communication units under stage IV, were handed over to the users in August 1990. According to the Ministry, units under stage II extension are likely to be handed over by the end of 1990. No definite time schedule was available for handing over of units under stage III extension. In all, 30.88 per cent of the total requirement was yet to be made operational.

The Ministry stated (October 1990) that the remaining links were also nearing completion and were expected to be in operational use within this year. It added that the Indian Air Force had a number of other radar systems in operational deployment to meet the prevailing scenario and essential communication requirements for maintaining adequate command and control have been provided by resorting to hired dedicated DOT circuits and by deploying their own wireless communication systems.

4.7 Operation and maintenance

Radar type 'A' was inducted in service in 1976. A study was made in 1987 by specialist officers with a view to improve upon the deficiencies in terms of operational availability, reliability and maintainability. Its report submitted in June 1987 brought out operational limitations, lack of provision for back up depot spares till 1984, limited procurement of carried spares, non-identification of agency for imparting training for servicing and inadequate updatements. The Ministry stated that the recommendations made by the study groups were implemented in order of priority bringing the performance of radar to a satisfactory level.

4.8 Setting up of repair facilities

4.8.1 Main workshop

An amount of Rs.2 crores was earmarked for the main workshop. Various work services required for repair facilities in the Area Maintenance Support Establishment (AMSE) were sanctioned during October 1977 to September 1984 at a total estimated cost of Rs.177.02 lakhs. Their completion, planned progressively between April 1978 and March 1985, was completed between December 1978 and September 1987. According to the Ministry, AMSE had the capability of providing maintenance support for a majority of the systems already inducted into service.

Upto April 1990, capital equipment, tools and plants test equipments costing Rs. 8.75 crores had been procured and installed. However, as many as 1,491 repairable items, whose capital cost was Rs.2.3 crores, remained unrepaired upto August 1990.

The master plan for land and buildings for AMSE, prepared in 1986, had not been approved so far (October 1990). Consequently, setting up of repair facilities specially for power and airconditioning equipment could not be organised and this had resulted in deterioration of equipment due to inadequate covered storage accommodation. The Ministry stated in October 1990 that storage shed costing Rs.19.2 lakhs had been sanctioned to tide over the immediate problem of storage and the accom-

modation was likely to come up by June 1991. On the logistics side, partial stock taking carried out during 1989-90 had revealed deficiencies in stores to the extent of approximately Rs.26 lakhs. No investigation had been conducted so far to ascertain as to why such a situation was allowed to persist over the years.

4.8.2 Regional Workshops

In 1981, approval had been accorded to the setting up of two Regional Area Maintenance Establishments (RAME) to give maintenance cover to the field units located in their areas. Sanctions for setting up the RAMEs were accorded in January 1986 and July 1989 at a cost of Rs.5.75 crores and Rs.5.5 crores respectively. However, both the establishments had not become operational so far (November 1990).

According to the AMSE, due to delay in setting up the repair facilities, an avoidable expenditure of Rs.51 lakhs had to be incurred during 1987-90 towards deployment of their technical manpower at the field formations and transportation of equipments etc.

Even the manpower available with AMSE was neither adequate, nor competent to undertake the repair tasks. This lack of technical facilities, capacity and expertise was responsible for the inability of the AMSE to provide the requisite maintenance support to the operating units. The case for revision of establishment proposed by AMSE in August 1989 was still awaiting approval (October 1990).

4.9 Financial impact

The overall financial outlay of the plan had gone upto Rs.833.60 crores in March 1987 as against the original estimate of Rs.227.52 crores, resulting in an increase of 266 per cent. Actual expenditure incurred on the plan upto 1988-89 was Rs.678.26 crores. The actual expenditure incurred in respect of radar, communication and works services upto 1988-89 was in excess to the extent of 131 per cent, 405 percent and 191 percent respectively when compared to the original cost estimates. According to the Ministry, the plan projections in terms of physical and financial targets prepared initially were only rough estimates depending upon the inputs available at that point of time. Further, serious gaps and deficiencies existed in indigenous design/development/production and installation capabilities which had their own impact on the time frames of the ADGES Plan.

In April 1990, the outlay of the plan was assessed at Rs.1,000 crores. The factors responsible for increase in the outlay of the plan were stated to be increase in the scope of work, cost escalation and new induction as part of modernisation process from stage to stage, procurement of enhanced range of spares, upward variation in FE rates etc.

The CCPA approval for revision in cost estimates of the plan had not been obtained as required under rules. It was stated by the Ministry that a note for the CCPA was under finalisation for reporting expenditure incurred and seeking direction for further expenditure to complete the plan implementation.

5. Training simulators

5.1 Introduction

Flight training simulators are vital training aids aimed at providing effi-

cient training to teach various flight exercises as well as to enable pilots to acquire higher flying skills. Cost effective and capable of use unaffected by weather and environmental constraints, availability of weapon ranges and other flying restrictions, the simulator permits the only safe means by which pilots can practice procedures which would be hazardous and at times impossible to attempt in the air. The simulators in the IAF are used for initial conversion on type as well as for applied operational flying and regular continuation training to maintain the appropriate level of operational competence and skill. They complement the actual flying training.

5.2 Scope of Audit

The installation and utilisation of some of the training simulators were reviewed in audit during August to October 1989.

5.3 Highlights

- **Two simulators costing Rs.11.49 crores remained nonfunctional since July 1985 and March 1987 respectively due to unstable power supply. The non-availability of one of the simulators resulted in shortfall of 82.63 percent in meeting the training needs and in the other case, pilots had to carry out additional ground training.**

- **An investment of Rs.5.07 crores on indigenous development and installation of another simulator for a specific aircraft proved largely infructuous as the same was not operational and the aircraft itself was due for being phased out.**

  A simulator imported at a cost of Rs.0.15 crore in March 1976 could not be used since April 1986 for want of critical spares.

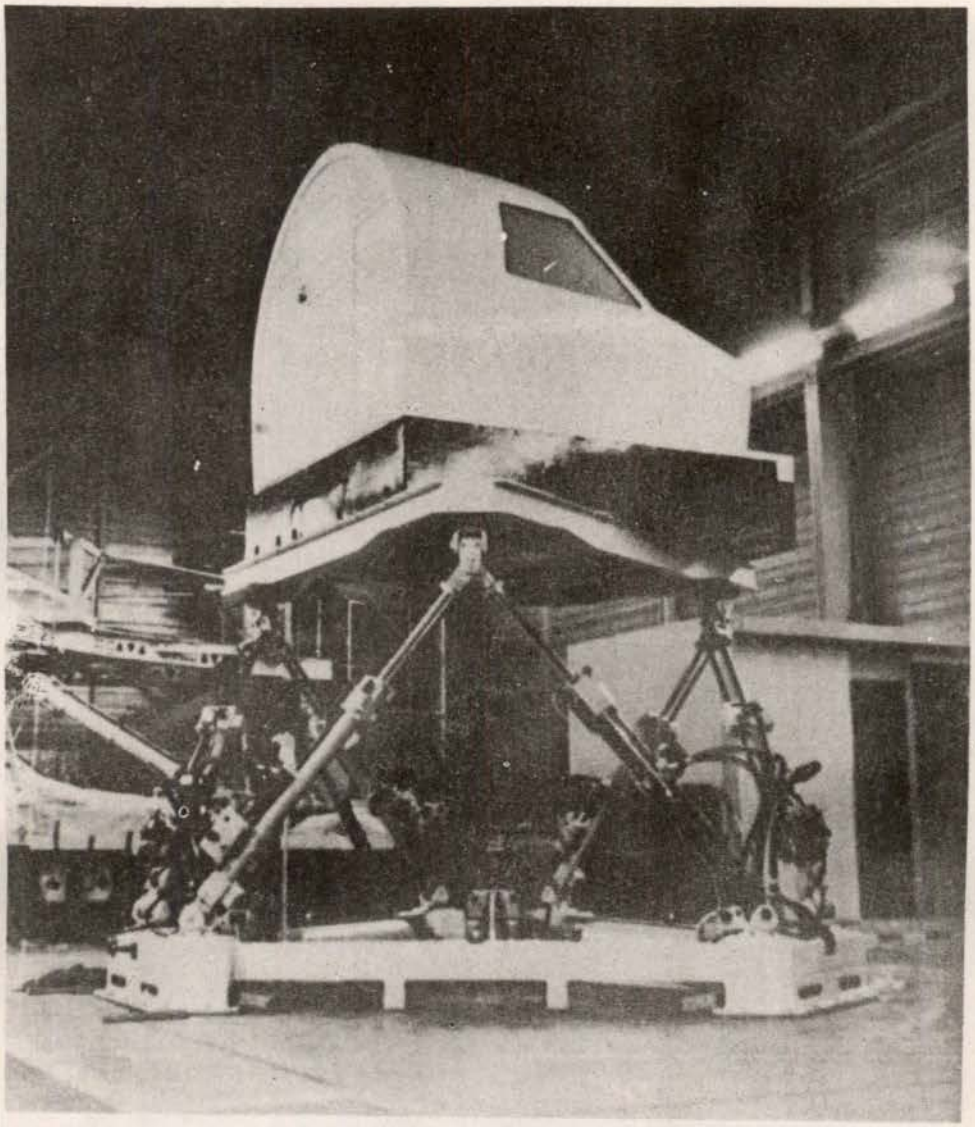
  Another simulator costing Rs.0.89 crore installed in June 1977 could not be deployed to its optimum use from May 1982 till a burnt out unit costing Rs.0.27 lakh was installed in January 1989 and made fully functional from August 1990.

5.4 Simulator 'S-1'

Two simulators were procured for a certain type of aircraft. The first simulator was received in December 1983 at station 'P' and made operational in July 1984, while the second was received at station 'Q' in April 1985 and made operational in July 1985. The delay in procurement of the simulators and consequential effect on training had been commented upon in paragraph 35 of the Report of the Comptroller and Auditor General of India, Union Government (Defence Services) for the year 1985-86.

The simulator at station 'Q' was functional upto November 1987. Against the annual requirement of simulator training of 684 hours, the total simulator training imparted since installation till November 1987 was only 495 hours; the shortfall is of the order of 82.63 per cent. The simulator started malfunctioning in November 1987 due to variation in the output power supply from the diesel generating sets. The pilots had to be sent to station 'P' for training. A complement of one technical officer and ten tradesmen had to be continuously employed to maintain the simulator even though it was not in use.

The Ministry of Defence (Ministry) stated in December 1990 that stabilised power system had since been procured and the simulator made opera-



Training Simulator

tional in September 1990. It further added that full exploitation of the simulator till November 1987 was not possible due to phased induction of the aircraft and non-availability of pilots.

Thus, the simulator procured and installed at a cost of Rs.5.42 crores, including work services costing Rs.0.71 crore remained underutilised.

5.5 Simulator 'S-2'

Another type of aircraft was inducted into service from June 1985 onwards. One simulator 'S-2', costing Rs.5.71 crores which was to be supplied by June 1985 was actually received between April and October 1986 and after completion of work services at a cost of Rs.0.36 crore in November 1986, was commissioned in March 1987. The delay in receipt and installation of the simulator and consequential expenditure on training of pilots abroad had been commented upon in paragraph 42 of the Report of the Comptroller and Auditor General of India, Union Government (Defence Services) for the year 1985-86.

Ever since its commissioning, the simulator did not function smoothly for want of stabilised and protected power supply and problems in airconditioning. The simulator could thus be utilised for only 1457 hours upto May 1990 against 2939 hours planned indicating a shortfall of fifty per cent.

The Ministry stated in December 1990 that the limited utilisation of the simulator was due to deployment of squadrons at operational areas, faulty airconditioning system and malfunctioning of frequency stabiliser.

Thus the simulator procured and installed at a cost of Rs.5.71 crores remained underutilised and pilots had to be given additional ground training.

5.6 Simulator 'S-3 and 'S-4'

In June 1977, sanction was accorded for indigenous development of simulators 'S-3' and 'S-4' for certain type of aircraft at a cost of Rs.6.47 crores by Defence Research and Development Organisation (DRDO). The simulators were to be delivered between December 1981 and August 1982. Due to significant delay in development, the simulators were installed only in December 1985 and in May 1986. These were commented upon in paragraph 10 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.

While simulator S-4 functioned satisfactorily, simulator S-3, installed in December 1985 could be taken over only in October 1988 after completion of works services costing Rs.78.19 lakhs and rectification of defects. The simulator, however, functioned unsatisfactorily as the environmental conditions in terms of airconditioning and power supply were not upto the required level. Consequently, work services had to be sanctioned at a cost of Rs.9.43 lakhs, which was subsequently increased in April 1989 to Rs.14.56 lakhs, to ensure the required conditions of temperature and humidity on a continuous basis. The simulator system had to be packed in April 1989 at site till completion of the work services in March 1990. The testing of new compressor of the airconditioning unit was in progress. (December 1990).

Against the planned utilisation of 1320 hours and targeted training of 64 pilots per annum, the simulator could only be used for 96 hours since installation and 22 pilots utilised the simulator upto April 1989. The Ministry stated (December 1990) that the under-utilisation of the simulator was on account of reduction in the number of squadrons due to phasing out of the aircraft and problems relating to airconditioning. The aircraft were scheduled to be fully phased out by March 1991. It further added that alternate utilisation of the simulator was being studied:

Thus the investment of Rs.5.07 crores on procurement and installation of the simulator S-3 became largely infructuous as the simulator could not be fully exploited for want of appropriate environmental conditions.

5.7 Simulator 'S-5'

Simulator S-5 was imported at a cost of Rs.15 lakhs alongwith a type of aircraft and installed in March 1976. As per the contract, the supplier guaranteed the supply of spares for a period of seven years from the date of signing the delivery acceptance certificate. The simulator functioned satisfactorily upto March 1986, when it fell due for second major overhaul after completion of the prescribed operational hours.

In January 1987, the manufacturers of the simulator expressed their inability to supply the critical spares for servicing the simulator. A team of the supplier which visited the station in September 1987 expressed their inability to service the simulator unless all the aggregates were overhauled at the factory as the production of spares had been stopped. The offer of the firm to overhaul the simulator abroad was not processed by the Air HQ as the simulator had become obsolete. Hence, the simulator was not overhauled and is not presently in use.

The Ministry stated in December 1990 that the use of simulator as a training aid was being explored.

Thus inability of Air HQ to secure supply of spares for overhaul in time resulted in the simulator becoming non-operational after only 10 years of operation as against expected life of 15-20 years. Thus the pupil pilots would remain without the benefit of simulator training due to non-availability of this training aid.

The Ministry stated in December 1990 that the training was enhanced by extra practice on the ground, in the aircraft cockpit etc.

5.8 Simulator 'S-6'

Simulator S-6 for a certain type of aircraft was imported and installed at a cost of Rs.0.89 crore including works services in June 1977. The simulator functioned satisfactorily except for the visual orientation system which became unserviceable in May 1982 when the extra high tension (EHT) unit was found burnt. The EHT unit was procured and installed in January 1989 at a cost of Rs.0.27 lakh but the visual orientation system still remained non-functional.

The Ministry stated (December 1990) that the instrument flying of the aircrew had continued throughout even when the visual orientation system was unserviceable. From the Ministry's reply it was seen that the simulator was made fully operational only from August 1990.

Thus the simulator could not be deployed to the optimum level from May 1982 to July 1990.

TRAINING

6. Procurement of a simulator for driving training

The Air Force (IAF) was unable to reap savings to the tune of Rs.4.4 lakhs per annum for over three years in training the mechanical transport drivers because of the delay in procurement and installation of a simulator for driving training, which was sanctioned in October 1985 but installed only in November 1989. The details are as follows:

The training of drivers was being imparted by giving them actual driving practice on vehicles. This involved high cost in terms of manhours spent, expenditure incurred on fuel and oil as well as on the initial cost of vehicles and maintenance and safety hazards. Air Headquarters (HQ) felt the need to improve the age old training methods and submitted a proposal in March 1983 to induct a simulator for driving training. It was brought out in the proposal that with the induction of simulators, the IAF would be able to reduce the number of heavy vehicles and instructional staff apart from effecting savings in fuel and oil to the tune of about Rs.4.4 lakhs per annum. In October 1985, procurement of a simulator was sanctioned by the Government at a cost not exceeding Rs.20 lakhs including Rs.3 lakhs on civil works. Funds required for the procurement of the simulator were provided during 1985-86.

While the sanction was issued in October 1985, the contract for the supply of the simulator was concluded with a foreign firm only in February 1988. By that time the cost of the simulator had gone up by Rs.2.21 lakhs.

The Ministry of Defence stated in October 1990 that though the Government sanction was issued in October 1985, it took some time to finalise the technical specifications and in the meantime, the price had escalated. The simulator though ready for despatch could not be lifted due to delay in issue of letter of credit in October 1988. The simulator was received in the unit in April 1989.

The works services required to house the simulator had been sanctioned in August and September 1988. These were completed in July 1989 at a cost of Rs.6.75 lakhs as against the originally sanctioned cost of Rs.3 lakhs. The simulator was finally installed and commissioned in November 1989.

Thus the procurement of a simulator was inordinately delayed resulting in an extra expenditure of Rs.2.21 lakhs. Moreover, the cost of civil works also went up to Rs.6.75 lakhs as against the original estimate of Rs.3 lakhs.

WORKS SERVICES

7. Acquisition of land and sanction of works services

A Board of Officers was assembled in 1975 at Anupsagar, near Bikaner, for assessing the requirement of land and works services for the location of an Air Force formation. The total land to be acquired was worked out by the Board as 177 acres costing Rs.27.73 lakhs. Execution of works services was estimated to cost Rs.202.27 lakhs. Out of the 177 acres of land to be acquired, 90 acres was under the management of Colonisation Commissioner, 75 acres

belonged to the State Government and the balance was held by the Army. The land belonging to the State Government was available at Rs.1000 per acre.

In October 1977, Air Headquarters (HQ) approached the Ministry for sanction to acquire land pending finalisation of the project. The Ministry did not agree to this course of action and suggested in September 1978 that Air HQ submit a consolidated requirement covering both land and works services.

A fresh Board assembled in May 1980 to assess the requirement of land and works services recommended acquisition of 180 acres of land of which 10 acres belonged to the Army. For the remaining 170 acres, the State Government demanded payment at Rs.25 per square yard (Rs.1,21,000 per acre). While the cost of acquisition of land worked out to Rs.205.70 lakhs, execution of works services including land acquisition was indicated as Rs.619.71 lakhs.

The case for land acquisition and work services was again taken up by Air HQ in September 1981 with the Ministry. However, the Ministry sanctioned in January 1983 the acquisition of 177.04 acres of land (total cost Rs.1.28 crores) at Rs.15 per square yard which was the same rate as applied for acquisition of land at Bikaner for the Army. As the State Government insisted for payment at Rs.25 per square yard, the sanction accorded in January 1983 was amended in December 1988 authorising acquisition of 177.04 acres at Rs.25 per square yard at a total cost of Rs.2.14 crores. Thus, the land which was available for acquisition at Rs.29,040 and Rs.1,000 per acre prior to April 1980 had to be acquired at a higher cost due to delay in finalisation of Board proceedings convened in 1975 resulting in extra expenditure of Rs.1.86 crores. The Ministry stated (October 1990) that the extra expenditure was primarily due to change in the policy of the State Government to charge market rate for land to be transferred to the Defence Services and not due to delay in finalisation of Board proceedings. The Ministry's reply overlooks the fact that the land identified for acquisition was available at a cheaper rate in 1975 and the revision of policy of the State Government took place only in 1981.

Meanwhile, another Board of Officers, assembled in May 1983 to reassess the requirement of works services necessitated due to re-equipping of the Air Force formation, estimated the cost of works services at Rs.627 lakhs. While 83 acres were taken over in 1984 and 39 acres in 1989 (53 acres were still to be taken over), the Air HQ, while reviewing the project in May 1990, felt the necessity to convene a fresh Board of Officers as the cost of works services estimated in 1983 was likely to have doubled. The Ministry stated (October 1990) that in August 1990, the Command HQ has been advised to convene a fresh Board of Officers.

Thus due to delay, between 1975 and 1981, in initiating a comprehensive case for obtaining sanction for the acquisition of land by Air HQ, an extra expenditure of Rs.1.86 crores had to be incurred due to escalation in the price of land. Works services estimated to cost Rs.202.27 lakhs in 1975 were revised to Rs.627 lakhs in 1983 and these are likely to go up considerably as and when taken up for sanction. Till then, land acquired at a cost of Rs.2.14 crores would remain unutilised.

8. Construction of survival pool complex

In March 1971, administrative approval was accorded for the provision of additional works services for Rs.13.66 lakhs, later revised to Rs.16.82 lakhs in December 1978, for the Institute of Aviation Medicine, Bangalore. The estimate included the cost of the survival pool complex for Rs.7.40 lakhs. The survival pool was meant to conduct live trials and practical training to simulate aircrew actions in case of rescue/emergencies over water and operational research work regarding aeromedical evaluation of various sea survival equipments.

The construction of the complex was commenced in July 1977 and completed at a cost of Rs.14.39 lakhs in March 1979. The administrative approval accorded in March 1971 catered for a platform for the winch for simulated paradrops. It was decided in July 1976 by the Military Engineer Services (MES), the agency responsible for execution of the work services, that the work relating to provisioning and installation of the winch would be carried out by the MES, which was earlier presumed by the agency, to be completed under the arrangements of the users. The specifications for the winch were finalised and approved by the MES and the users in July 1976. The Ministry stated (September 1990) that the specifications for the winch were not specified by the users and were finalised after meetings and discussions between the MES and users.

Tenders for installation of winch were invited by MES twice in 1978 but the offers were not according to the required specifications. The users were able to locate in August 1981 a local firm which was considered competent to undertake the job meeting the technical requirements. A contract was concluded in May 1982 with the firm for a lump sum amount of Rs.0.84 lakh for supplying and installation of the equipment. Although the equipment was installed by the firm, the contract had to be cancelled in April 1988 because of the failure of the firm to rectify certain defects in the equipment. The Ministry stated that as the winch installed did not meet the user's requirements, an alternative winch of a helicopter was installed by MES and live trials conducted in 1989.

The survival pool was taken over by the user in May 1980. The training research was conducted between May 1980 and August 1983 without the winch facility. The quality of training/research was suboptimal since free fall simulation and winching rescue operation training could not be conducted. In May 1984, the Headquarters, Training Command accorded administrative approval for carrying out special repairs to the survival pool at an estimated cost of Rs.2.08 lakhs. The survival pool was under maintenance and repairs from August 1983 to April 1990. The Ministry stated in September 1990 that the same had since been taken over and used for training purposes.

The case revealed that:

- the construction of survival pool complex sanctioned in March 1971 at a cost of Rs.7.40 lakhs and completed in eight years at a cost of Rs.14.39 lakhs was not fully functional for the purposes of training/research due to unsatisfactory performance of winch.

- the survival pool complex had to undergo repairs at a cost of Rs.2.08

lakhs for six years from August 1983 to April 1990 affecting the quality of training/research.

PROVISIONING

9. Extra expenditure in the procurement of automatic telephone switch boards

In response to a global tender enquiry floated in July 1979 for the procurement of 18 Automatic Telephone Switches (ATS) required for the Air Force communication network, offers were received in October 1979 from firm 'X' and firm 'Y' indicating the unit cost of ATS as Rs.2.82 lakhs and Rs.3.63 lakhs respectively. Their offers were valid upto January 1980. The Technical Evaluation Committee (TEC) and Negotiating Committee (NC) were constituted in January 1980 to evaluate the offers from the technical and financial angles. The offers had to be kept alive upto 31st May 1981 by obtaining extensions.

. In the meantime, firm 'X' gave a technical presentation of their product in April 1980 followed by a live demonstration in August-September 1980. The performance of their equipment was found satisfactory meeting the prescribed technical parameters. Firm 'Y' gave neither technical presentation of their product nor offered their equipment for user evaluation trials. Consequently, in September 1980, TEC recommended the offer of firm 'X' for acceptance. Technical presentation was given subsequently by firm 'Y' in March 1981. Based on the paper particulars and the presentation given, TEC concluded in April 1981 that the offers of both the firms met the technical specifications and it recommended acceptance of product offered by firm 'Y' subject to successful user trials.

Both the firms were advised to attend NC meeting in May 1981. The firms did not participate in the meeting. The NC recommended negotiation with firm 'X' only. Certain additional clarifications were sought from both the firms by the Ministry of Defence. Firm 'X', in the meantime revised their prices in June 1981. Eventually, the NC in its meeting held in July 1981 advised firm 'X' to submit their firm and final offer. As per the final offer of firm 'X' submitted in July 1981, valid upto 31st August 1981, the unit cost of ATS worked out to Rs.3.39 lakhs. The offer for supply of spares etc. had earlier been submitted by firm 'X' in May 1981. Ultimately, a contract was concluded with firm 'X' in October 1981 for 18 ATS and spares etc. at a total cost of Rs.1.09 crores. When compared to the original offer of 1979 and the offer of May 1981, the transaction had resulted in an extra and avoidable expenditure of Rs.17.09 lakhs which is mainly due to the delays in conducting the technical and financial analysis of the offers and administrative decisions at various levels being delayed. It was stated by the Ministry of Defence in October 1990 that a period of roughly 18 months spent in the technical evaluation followed by commercial negotiations for such sophisticated and state of the art equipment was considered normal and the contract was concluded at the earliest possible time. Further, it was added that they would ensure that technical and financial negotiations are completed in future in minimum time taking into account all the constraints.

The case revealed that technical and financial evaluation of the offers was not finalised within their validity period due to inordinate delays and slow decision making process at various levels which resulted in an extra and avoidable expenditure of Rs.17.09 lakhs.

10. Purchase of radio frequency equipment

Quotations were invited in November 1982 by a Project Office from Bharat Electronics Limited, Ghaziabad (BEL) and Indian Telephone Industries, Bangalore (ITI) for the supply of certain 2GHz radio frequency equipment required by the Air Force. BEL submitted their quotation in December 1982 for Rs.352.22 lakhs. The offer was valid upto March 1983. ITI did not quote. The offer of BEL was considered reasonable by the project authorities as it was cheaper than the cost paid for similar equipment in the past. The Ministry of Finance (Defence), was, however of the view that there was scope for reduction in the price quoted by BEL and advised in April 1983 that the project authorities should seek an extension for the period of validity of the offer and request the company to quote a more reasonable price. Accordingly, in May 1983, BEL was requested to extend the validity of their offer upto June 1983. The offer was extended up to September 1983 by BEL but with the revised cost of Rs.375.50 lakhs. The offer was then negotiated by the Ministry of Defence in January 1985 and a formal supply order was placed on BEL on 31st January 1985 for supply of the equipment at a total cost of Rs.368 lakhs. Thus, the assessment of the Ministry of Finance (Defence) in April 1983 that the price could be brought down did not prove correct. Delivery of the equipment originally scheduled to be completed by February 1986 had to be revised to April 1988. The equipment were actually received during September 1987 and January 1989.

Apparently, the delay of about two years in evaluation of the offer and negotiation with the company resulted in extra expenditure of Rs.15.78 lakhs, besides delay in delivery.

The Ministry of Defence stated in September 1990 that technical evaluation and commercial negotiations for such a sophisticated system takes time and it was not possible to complete the evaluation process within the period of validity of the offer. The Ministry was of the view that the price could have been brought down further had it not been a single vendor case, but perforce the contract had to be finalised at the higher price of Rs.368 lakhs.

11. Procurement of a system

A system, which was considered to be essential for the safety of aircraft during operational missions, could not be inducted into the Indian Air Force (IAF) even after a lapse of nine years after the projection of its requirement in January 1981. The delay also led to the IAF having to bear an extra financial burden of Rs.2.89 crores. The details are as follows:

Indian missions abroad were approached in December 1982 to obtain quotations from vendors and also to identify suitable firms for supplying the system. In response to the inquiries made, offers were received from five firms 'A', 'B', 'C', 'D' and 'E'. A technical committee (Committee) was constituted in January 1983 to evaluate and recommend a suitable offer meeting the IAF requirements.

The Committee evaluated the offers in May 1983 and found that offers of firm 'D' and 'E' were inadequate and unproven and hence recommended that their offers need not be considered further. The Committee submitted its re-

port in May 1985 and stated that the systems of firm 'A', 'B' and 'C' were technically acceptable and recommended that commercial negotiations be held with these firms with a proviso that the firms must supply guarantee of performance for the payloads. Approval in principle of the Government was obtained in October 1984 for incurring an expenditure of Rs.9 crores including cost of integration and modification of aircraft by Hindustan Aeronautics Limited (HAL). Approval of the Government was also obtained to proceed with commercial negotiations with those firms.

Commercial negotiations with firms 'A', 'B' and 'C' were held in September-October 1985. The rates quoted for an outright purchase of 100 systems and certain number of expendables were Rs.9.92 crores by firm 'A', Rs.11.21 crores by firm 'B' and Rs.13 crores by firm 'C'. After further negotiations, firm 'A' revised its offer to Rs.8.26 crores and firm 'B' to Rs.10.14 crores. Firm 'C' however, did not agree to any reduction. All the three firms also agreed to the transfer of production technology to meet additional requirements. During negotiations, it was brought out that the system offered by firm 'C' was more advanced as compared to that of the other two firms. The offer of firm 'C' was, however, not considered as the firm refused to supply the requisite details regarding the guaranteed performance of the payloads, as well as a draft contract and also declined to participate in the commercial negotiations. The negotiating committee was able to make firm 'B' reduce its rates further and the final quotations of the two short listed firms were as follows:

Firm 'A'	-	Rs.8.26 crores
Firm 'B'	-	Rs.9.57 crores

In October 1985, arrangements were made with firm 'A' for signing of the contract. The firm was to obtain clearance from its Government for transfer of production technology and supply of additional systems.

The negotiating committee ultimately recommended that a contract be signed with firm 'A' for outright purchase of 100 systems and certain number of expendables at Rs.8.26 crores. Accordingly, a contract was signed with firm 'A' in February 1987.

As per the provisions of the contract, the firm had to carry out effective flight trials prior to bulk production clearance. A time frame of five months from the effective date of contract was laid down for carrying out modifications, integration and flight trials. The effective flight trials were to be carried out either on aircraft 'X' or 'Y'. However, both the aircraft had to undergo trial modification. The modifications were to be carried out by HAL. Sanctions to modify aircraft 'X' and 'Y' by HAL for carriage of the system were issued in April and May 1987.

Firm 'A' could not obtain the export licence from its government within the stipulated period. It could obtain it only in May 1988. Surprisingly, the firm refused to supply the systems at the contracted price of February 1987 and increased the cost of the contract from Rs.8.26 crores to Rs.11.57 crores. On further negotiations with firm 'A' in October-November 1988, the cost was agreed to Rs.11.15 crores and accordingly a revised contract signed in November 1988. Thus, IAF had to bear the extra financial burden of Rs.2.89 crores.

According to the delivery schedule of the revised contract, a certificate

on the successful flight test was to be signed by August 1989 and deliveries of the system were to commence from May 1990. However, the flight test certificate was issued only in May 1990. The system has not been inducted so far (August 1990). The Ministry of Defence (Ministry) stated in August 1990 that according to the revised schedule, deliveries would commence from March 1991.

As regards the modification of aircraft for carriage of the system, an order to modify aircraft 'Y' was placed on HAL in December 1988 but no such order has yet been placed on HAL to modify aircraft 'X' for want of mod leaflets which are yet to be received from the manufacturers (August 1990). The Ministry stated that the action to place the order was under process.

Audit analysis of the sequence of events indicated the following:

- The technical committee took 28 months to evaluate the offers and recommend commercial negotiations with firms 'A', 'B' and 'C' in May 1985, having sorted out important aspects on systems and payloads.

- Although, it was known from the beginning that two types of aircraft had to be modified, the order on HAL for modifying one type of aircraft was issued in December 1988 and the order for modifying the other type of aircraft could not be issued till August 1990.

- The operational efficiency of the system could be established only in May 1990, after a lapse of nine years.

According to the Ministry, although ideally the IAF should have got the system at the earliest, under the then existing circumstances, even the best planning efforts involved slippages.

12. Avoidable expenditure on provisioning of spares

In order to complete the overhauling task of an aeroengine for the year 1986-87, Air Headquarters (HQ) projected a case in April 1987 for import of 62 units of segment assembly (spare of aeroengine) at a cost of Rs.35.48 lakhs from a foreign firm. The requirement projected was based on a special review carried out by the feeding unit of a Base Repair Depot and an indent placed on Air HQ. The projected cost was based on catalogue price which was Rs.32,392 per unit in April 1987 and Rs.35,632 per unit in October 1987 taking into account the discount allowed. The procurement of spares was approved by the Ministry of Defence (Ministry) in October 1987 and the approval for release of foreign exchange (FE) accorded in April 1988. However, no contract with the foreign firm was concluded within the validity period. Air HQ approached the Ministry in September 1988 for revalidation of the FE sanctioned earlier for contract action.

In the meantime, Air HQ obtained another sanction in November 1988 for procurement of 75 units of segment assembly. Subsequently, the quantity was reduced to 69 and clubbed with the earlier indent of 62 units. A consolidated indent for 131 units was put up to the Ministry for approval in July 1989. The proposal was approved by the Ministry in August 1989 and a contract for procurement of 131 units of segment

assembly at a total cost of Rs.55.90 lakhs concluded in September 1989. By that time, the firm had increased the price of the spares to Rs.42,675 per unit. This resulted in an extra expenditure of Rs.4.36 lakhs on purchase of 62 units due to price escalation (Rs.1.73 lakhs) and exchange rate variation (Rs.2.63 lakhs). The delivery of the item was to commence from May 1991 and scheduled to be completed by November 1991.

The Ministry stated in October 1990 that the requirement projected was for completion of firm task for 1986-87 and forecast task for 1987-91. The task for the year 1986-87 and subsequent years was completed by cannibalising the subject item from rear engines. The Ministry further stated that non-availability of segment assembly had resulted in accumulation of repairable items on rear engines. It added that on an average, two or three aircraft had remained on ground (AOG) for want of aero engines during 1986-87, 1987-88 and 1988-89 for short durations.

13. Purchase of mobile liquid oxygen tankers

Liquid oxygen (oxygen) was required to be charged into oxygen convertors carried on board aircraft 'Z' for breathing by aircrew. At permanent bases, the oxygen was stored in static storage tanks. In forward locations it was supplied by manufacturers in their tankers for which they recovered extra charges. This arrangement was not found operationally sound. Hence Air Headquarters (HQ) proposed in July 1981 to have six mobile oxygen tankers. However, the Air Staff Equipment Policy Committee, while concurring with the case reduced the proposed scale to three tankers. Sanction was issued to this effect in February 1983.

In March 1983, Air HQ floated an indent for procurement of three tankers at an estimated cost of Rs.30.45 lakhs. Based on the indent, two supply orders were placed by the Department of Defence Supplies in June 1984, one on firm 'A' and the other on firm 'B'. Firm 'A' was to supply three chassis at a total cost of Rs.4.68 lakhs by July 1984. The manufacture, supply and installation of three oxygen tankers on the chassis supplied by firm 'A' was assigned to firm 'B' at Rs.14.91 lakhs. The delivery of tankers was to be completed by April 1985. The price prevailing at the time of delivery of stores was payable to firm 'A'. The price to be paid to firm 'B' was firm and fixed.

While reviewing the position in May 1984, the earlier authorised scale was considered inadequate and it was, therefore, decided from the professional angle to increase it to six tankers. The administrative decision to acquire six tankers was taken in July 1986. Pending approval of the revised scale, another indent was raised by Air HQ in June 1985 for procurement of three additional tankers. Firm 'B' had offered supply of additional tankers at the old rates upto 31 July 1985. However, due to delay in the procurement, the additional tankers could not be arranged at the rates finalised in July 1984. Eventually, the additional three tankers had to be purchased at a higher cost involving extra expenditure of Rs.3.42 lakhs in August 1985 from firm 'B'. The cost of the earlier order was increased to Rs.33.24 lakhs. Their supply was due by August 1986.

Due to a certain dispute regarding terms and conditions of the supply order, firm 'A' did not supply the chassis as per the delivery schedule indicated in June 1984. The dispute was resolved only in June 1986. According to Ministry

of Defence (Ministry), the delay in resolving the issue was investigated and necessary instructions were issued in November 1988 to avoid recurrence of such instances in future. Meanwhile, the price of chassis had undergone revision substantially on many occasions. Ultimately, the procurement of all the six chassis was arranged at a total cost of Rs.12.38 lakhs. In the process, an extra expenditure of Rs.3.03 lakhs had to be incurred. The first three tankers were supplied by firm 'B' in February 1987. Another lot of three tankers was made available in February 1988. The Ministry added in October 1990 that revision of scale of the tankers was on the basis of threat perception.

The case revealed that the provisioning of the tankers had been unrealistic which necessitated revision of requirements within a short period. The delay and piecemeal purchase of tankers resulted in avoidable expenditure of Rs.6.45 lakhs.

OTHER CASES

14. Safety violations

An aircraft and a refueller were damaged beyond economical repairs and another aircraft sustained minor damages in the dispersal area at an Air Force station in September 1987 in a fire accident. The loss was assessed to be Rs.2.52 crores. The accident was due to negligent driving during an unauthorised journey by an untrained and unexperienced person.

An airman belonging to a different trade and not licensed to drive a motor vehicle drove a refueller in an unauthorised zone at high speed, skidded and toppled the vehicle. The spilt fuel from the refueller got ignited and damaged two aircraft as well as the refueller. He had been driving the refueller for about a year. The instructions stipulated that only experienced mechanical transport drivers should drive in such restricted zones to the minimum extent at speeds not exceeding 10 kms per hour keeping a 30 metre distance from the parked aircraft unless the work requirement dictated closer proximity. This unauthorised airman had undertaken this mission to draw his pay from the pay point near the duty crew section.

A court of inquiry (October 1987) held two airmen and one officer as directly responsible and two more officers responsible for inadequate supervision. The Station Commander stated that enough authorised personnel were available to handle the refueller. The Chief of the Air Staff concurred with the findings of the court of inquiry and ordered disciplinary action against two airmen and administrative action against three officers and writing off of the loss of Rs.2.52 crores. The loss had not yet been written off (August 1990).

The Ministry stated in August 1990 that instructions would be issued to forestall such incidents in future.

15. Loss of stores and equipment due to fire

Two cases of fire accidents in Air Force units due to negligence resulted in loss of stores and equipment to the extent of Rs.81.01 lakhs. The fire broke out in both the cases due to non-observance of prescribed safety precautions. The details of the cases were as follows:

Case-I

On 27th January 1988, a major fire broke out in the shelters housing a de-

tachment of a squadron located at high altitude resulting in total loss of radar and radio equipment besides other stores. A Court of Inquiry which was convened in February 1988 to investigate the fire, opined that the fire had been caused by the kerosene oil bukhari in the Commanding Officer's cabin remaining 'on' and being left unattended. This was contrary to the instructions that bukhari should not be left unattended at any time and was to be lit only when someone was present near it. On two occasions in the past, there had been similar fire accidents which could be put out due to presence of people nearby. The Court also found that lack of adequate and suitable fire extinguishers hampered the fire fighting operations. The Court recommended writing off Rs.67.19 lakhs as loss.

The Ministry stated (October 1990) that the fire fighting equipment failed to function at zero temperature and a project on development of fire fighting equipment for use at high altitudes had been ordered and administrative action had been taken against the concerned officers.

Case-II

On 3rd October 1985, during the course of a live exercise, the crew members of radar 'X' of a squadron reported that water temperature of a certain mounted power plant of the radar had exceeded the limit of normal operating temperature and obtained permission from the Command post to switch off the radar to enable the power plant to cool. Accordingly, the radar as well as the power plant were switched off.

The power plant needed refuelling before it was to be switched on for further exercises. The crew members operating the power plant, instead of refuelling the power plant as per standard procedure started refuelling the engine with the help of a rubber pipe and in the process spilled petrol over the battery head and connector just above the engine causing instantaneous fire. The entire power plant compartment was engulfed in flames resulting in damage to radar 'X' and other appliances worth Rs.13.82 lakhs. A Court of Inquiry convened in October 1985 attributed the accident to the wrong method adopted for refuelling the power plant and recommended disciplinary/ administrative action.

The Ministry stated in October 1990 that action had been taken against the erring staff.

16. Underutilisation of costly equipment

Two computerised decoding equipment used for decoding data recorded in the flight data recorder for analysis of flight parameters in case of flight accidents or during training were procured at a cost of Rs.152.76 lakhs. While one decoding equipment installed in December 1987 remained unserviceable for the past two years, the other one, though received in June 1987, could be installed only temporarily in October 1989 pending execution of works services.

The contract was concluded with a supplier in September 1986 for supply of one decoding equipment for Rs.76.38 lakhs for decoding the flight data recorder of aircraft 'A'. The equipment was received in March 1987 and was commissioned in December 1987. The expenditure incurred on works services for its installation was Rs.4.40 lakhs. The equipment became unserviceable

in July 1988 due to a faulty transformer and was repaired in August 1988. In November 1988 it became unserviceable due to failure of memory block. The equipment continued to remain unserviceable (October 1990). The Ministry stated (October 1990) that the supplier offered to supply a memory block which was, however, not accepted as the serviceability of the item was not known and that indigenous efforts are being made to either service the same or replace it with a semiconductor core memory.

Another contract was concluded with the same supplier in April 1986 for the supply of one decoder for Rs.76.38 lakhs for decoding the flight data recorder of aircraft 'B'. The equipment required certain special environmental conditions for its installation. A Board of Officers convened in October 1986 estimated the cost of works services at Rs.18.80 lakhs excluding the cost of electrical portion of the works services which necessitated convening another Board in April 1988. In November 1988 administrative approval was accorded for the execution of works services for Rs.26.82 lakhs. The Ministry stated in October 1990 that owing to disturbed conditions in the Eastern sector, five percent of the works services had been completed so far and the probable date of completion is 24th January 1991.

Meanwhile, the equipment received in June 1987 was installed temporarily in the avionics laboratory in October 1989 pending commencement and completion of the permanent works services.

The case revealed that one decoder costing Rs.76.38 lakhs remained serviceable for a limited period after installation and thereafter continued to remain unserviceable for the last 24 months. The second decoder procured at the same cost could be installed only temporarily after a delay of 28 months due to delay in sanction and execution of works services necessary for its permanent installation.

17. Provision of lighting for taxi track at an airfield

Airfield 'X' used by both civil and service aircraft had lighting facility for the main runway provided by the Director General Civil Aviation (DGCA). In order to meet operational requirements, it was considered necessary that permanent lighting should be provided for the parallel taxi track, link and loop taxi tracks. The Directorate of Air Staff Inspection (DASI) had also emphasised in April 1980 that the airfield should have taxi track lights so as to enable night flying operations.

Accordingly, Air Headquarters (HQ) advised the Command HQ in July 1980 to convene a Board of Officers to determine the requirements for the proposed taxi track lighting. A statement of case was prepared in February 1983 in which the estimated cost of provision of taxi track lighting was indicated as Rs.35.22 lakhs plus Rs.4.13 lakhs as departmental charges, as the work was to be executed by the Central Public Works Department (CPWD). Government sanction was issued in April 1984 for executing the work at an estimated cost of Rs.40 lakhs. While obtaining Government sanction, it was stated that all the equipment required for installation would be indented for and supplied by an ordnance factory.

The Air HQ placed two indents on the ordnance factory in September and November 1984 for supply of items

required for installation at Rs.13.20 lakhs. The indents placed by Air HQ were endorsed to Military Engineer Services instead of to the CPWD. The CPWD authorities also placed indents for procuring the same items on the Director General Supplies and Disposals (DGSD) who concluded three contracts in July 1986, August 1986 and January 1987 with three firms at a total cost of Rs.21.90 lakhs. In October 1986, when the CPWD was informed that the equipment for installation would be supplied by Air Force, the DGSD had already finalised the contracts for a value of Rs.14.73 lakhs. The dual procurement of stores, due to the failure on the part of Air Force to intimate the CPWD in time resulted in equipment indented by Air Force costing Rs.11.35 lakhs becoming surplus. The Ministry stated (September 1990) that cancellation of indents was considered but was not possible and the equipment received had been diverted to stock holding depots for reallocation to other units. Initially, it was decided to accommodate Air Force Constant Current Regulators (CCR) and allied equipment for the above work in the existing CCR complex which was, however, not permitted by the DGCA when the work was taken up. As a result, the construction of a separate CCR complex was proposed and the sanction had to be revised to provide for the same. Revised Government sanction accorded in April 1989 for Rs.50.59 lakhs included Rs.2.70 lakhs for escalation in the cost of equipment and Rs.6.93 lakhs for the construction of a new CCR complex. The Ministry stated in September 1990 that the location of CCR complex was changed as the existing CPWD CCR complex was found inadequate for the Air Force equipment. The Ministry also added that the installation of taxi track lights had been completed and the CCR building was expected to be completed by December 1990.

The case revealed that the project which was recommended in 1980 to facilitate night flying operations as an operational requirement, had not been completed even after a lapse of 10 years. The failure on the part of Air Force to maintain effective co-ordination with the CPWD had caused dual procurement resulting in equipment costing Rs.11.35 lakhs being rendered surplus.

CHAPTER - IV

NAVY

REVIEWS

18. Induction of an aircraft

18.1 Introduction

In October 1986, a contract was concluded for the purchase of certain number of aircraft, ammunition and associated ground support equipment from abroad, at an estimated cost of Rs.327.05 crores. These aircraft were inducted into service from 1987 onwards.

18.2 Scope of Audit

The process of selection, procurement, operation and maintenance of the aircraft were reviewed in Audit. The timely establishment of adequate maintenance support to the aircraft was also examined.

18.3 Highlights

- **There were delays in the supply of aircraft and spare aeroengines.**

- **One of the airbases planned for the operations of the aircraft was expected to be ready only by the end of September 1990. The aircraft from station 'X' were operated with reduced load due to limited length of the runway.**

- **Flying efforts and the utilisation of the aircraft were considerably affected due to poor availability of the aircraft to the squadron.**

- **As a result of delay in commissioning the second squadron, 2685 flying hours could not be planned for use upto December 1989.**

- **There was a mismatch between the induction of the aircraft and the availability of major repair and overhaul facilities. In the absence of these facilities, Naval HQ had to resort to overhaul of the components abroad.**

- **Spare aero-engines were not procured as per the norms. Under provisioning may lead to increase in aircraft on ground days at a later stage.**

- **Specialist vehicles costing Rs.1.95 crores received between September 1987 and June 1989 had not been commissioned (October 1990).**

- **There was a shortage of 21 fully trained air crew upto October 1990.**

- **Navigational systems costing Rs.1.52 crores fitted in the aircraft proved inadequate.**

- **There was mismatch between the receipt of the aircraft ammunition and creation of facilities for their storage, repair and preparation. Therefore , the operation of the aircraft with its planned weapon package was not possible.**

18.4 Procurement

The induction of aircraft with spares and ammunition from abroad at an estimated cost of Rs.252 crores was ap-

of the aircraft. All attempts made by the guarantee specialists from the supplier to rectify the defects were unsuccessful. The Navy did not raise any guarantee claim on the supplier on this account till date (October 1990). In the absence of an accurate navigational system in the aircraft, the NHQ proposed to install an indigenous navigational system earmarked for another aircraft on a trial basis. Hindustan Aeronautics Limited (HAL) had quoted a price of Rs.3.37 lakhs in July 1988 for installation of the system apart from the cost of the system amounting to Rs.5.8 lakhs. Government sanction to this effect was issued in December 1988. The installation work was scheduled to be completed by HAL by August 1990. Thus, navigational systems costing Rs.1.52 crores (approximately) installed in the aircraft proved inadequate for their operational role.

18.11 Accounting of stores

The stores against the various contracts concluded with the supplier started arriving from February 1987 in a store depot at station 'X'. However, due to shortage of storage accommodation in the depot, stores could not be verified for their completeness and were not taken on ledger charge immediately. Civil works for provision of additional storage accommodation for the aircraft stores were sanctioned by Command HQ in May 1987 at an estimated cost of Rs.72.38 lakhs. The work which was to be completed by March 1989 was still at the tender stage (October 1990). As an interim measure, the local naval authorities sanctioned in August 1987 construction of two temporary sheds at a cost of Rs.4.87 lakhs. The work was completed in November 1988. Clearly, construction of storage accommodation was not synchronised with the arrival of the aircraft, stores and equipment.

18.12 Storage and preparation facilities for arms and ammunition

The contract concluded with the supplier provided for supply of various types of arms and ammunition required for the aircraft. In order to create facilities for its storage and preparation in a Naval Armament Depot (NAD) at station 'X', the Command HQ accorded a sanction in July 1985 as an operational work. The work costing Rs.137.29 lakhs was, however, commenced only in March 1988. Although, it was expected to be completed by the end of September 1989, the same was completed only in August 1990. Owing to the delay in creation of permanent facilities, the local naval authorities sanctioned the creation of interim facilities by addition/alteration to the existing magazines at an estimated cost of Rs.8.35 lakhs. The work on the interim facilities was completed in March 1988. The armaments meant for the aircraft started arriving in India from June 1987 onwards and the supplies were completed in March 1989. However, even after creation of interim facilities, the serviceability of one of the ammunitions could not be tested due to lack of manpower and testing facilities at the NAD. Claims for any defect/deficiency noticed later would not be sustainable under the warranty clause of the contract. Similarly, certain items of other armaments were yet to be subjected to 100 per cent examination (October 1990). During inspection in April 1989 certain numbers of another ammunition costing Rs.7.15 lakhs were found discoloured and their serviceability was suspect. The Ministry stated in October 1990 that the supplier had been requested to replace the stores and their response was awaited (October 1990). Thus, in the absence of proper storage and preparation facilities for the aircraft armament and lack of man-

power with the NAD, the operation of the aircraft with its planned weapon package was not possible.

19. Acquisition and maintenance of certain vessels

19.1 Introduction

Government approved in September 1983 acquisition of three types of vessels, ammunition and other special equipment from abroad at an estimated cost of Rs.967 crores. Three contracts were accordingly concluded with the supplier in September 1984 for acquisition of vessels type 'X', 'Y' and 'Z' with associated equipment, spares, and ammunition at a total cost of Rs.957.89 crores. These vessels were received by the Navy during 1986 and 1989 except one type 'X' vessel which due for delivery by end of 1990. The are based at Stations 'M' and 'N'. The contracts for acquisition of two more vessels of type 'X' were concluded in May 1987 and October 1989 respectively. These vessels were received in October 1987 and December 1989 respectively.

19.2 Scope of audit

The process of acquisition, operation and maintenance of these vessels were reviewed in audit. Establishment of adequate shore support to these vessels was also examined.

19.3 Highlights

- **Some of the agreed trials were not actually carried out before the commissioning of the vessels. In the case of first type 'X' vessel, one aspect of DAT was carried out in India at a cost of Rs.2.75 lakhs. This expenditure had not been recovered from the supplier which otherwise would have been borne by them.**

- **The requirement of maintenance and support facilities was not firmed up before the acquisition or simultaneously with the conclusion of the contracts for acquisition. The required facilities are now expected to be ready before 1993.**

- **Equipment worth Rs.4.20 crores acquired for the maintenance of equipment fitted on board vessels were kept in packages as received.**

- **Facilities for imparting basic training to the operators and maintenance staff of the vessels have not been established.**

- **The scheduled repairs of the vessels started falling due from April 1987 onwards. Pending completion of repair facilities, only the lowest echelon of repairs could be undertaken by straining the existing resources. Similar refit of ten more vessels are also falling due in 1992. However, the required facilities are likely to be available only by end 1993.**

- **A large number of design inadequacies and limitations were noticed in the case of type 'X' vessels. These had placed critical constraints on the operational deployability of the vessels acquired at a cost of Rs.618.30 crores.**

- **Diesel generator of one type 'Y' vessel failed prematurely. This had to be replaced at a cost of Rs.8.11 lakhs.**

19.6 Training facilities

Facilities were to be set up at Cochin, Jamnagar, Lonavla and Visakhapatnam for imparting basic training to the operators and maintenance staff of these vessels. A contract was concluded with the supplier in August 1988 for the supply of working documentation at a cost of Rs.17.70 lakhs. These documents were received in April 1989. However, contracts for the procurement of training equipment are yet to be concluded (October 1990). Thus the creation of training facilities for the vessels is still at the planning stage though the vessels were inducted into service progressively from April 1986 onwards. The trainees are at present given theoretical training in the schools and then taken to operational vessels for on the job training.

19.7 Maintenance of vessels

The vessels are to be given dry docking/repair as per the operation-cum-refit-cycle. The scheduled repairs of the vessels started falling due from April 1987 onwards. The Naval HQ stated in October 1988 that pending completion of repair facilities, only the lowest echelon of repairs were undertaken by straining existing resources. Naval HQ, however, conceded that certain cancellation/ postponement of repairs in respect of other ships accrued owing to insertion of repairs of these vessels in the repair schedules. The Naval HQ further stated that this adhoc arrangement cannot be made applicable for higher echelon of repairs. The first vessel of type 'X' falls due for her normal refit in April 1991, and normal refit of ten more vessels would fall due in 1992. The Ministry stated in October 1990 that the normal refit of these vessels would have to be carried out in India. However, the required facilities are likely to be available only by end 1993/early 1994.

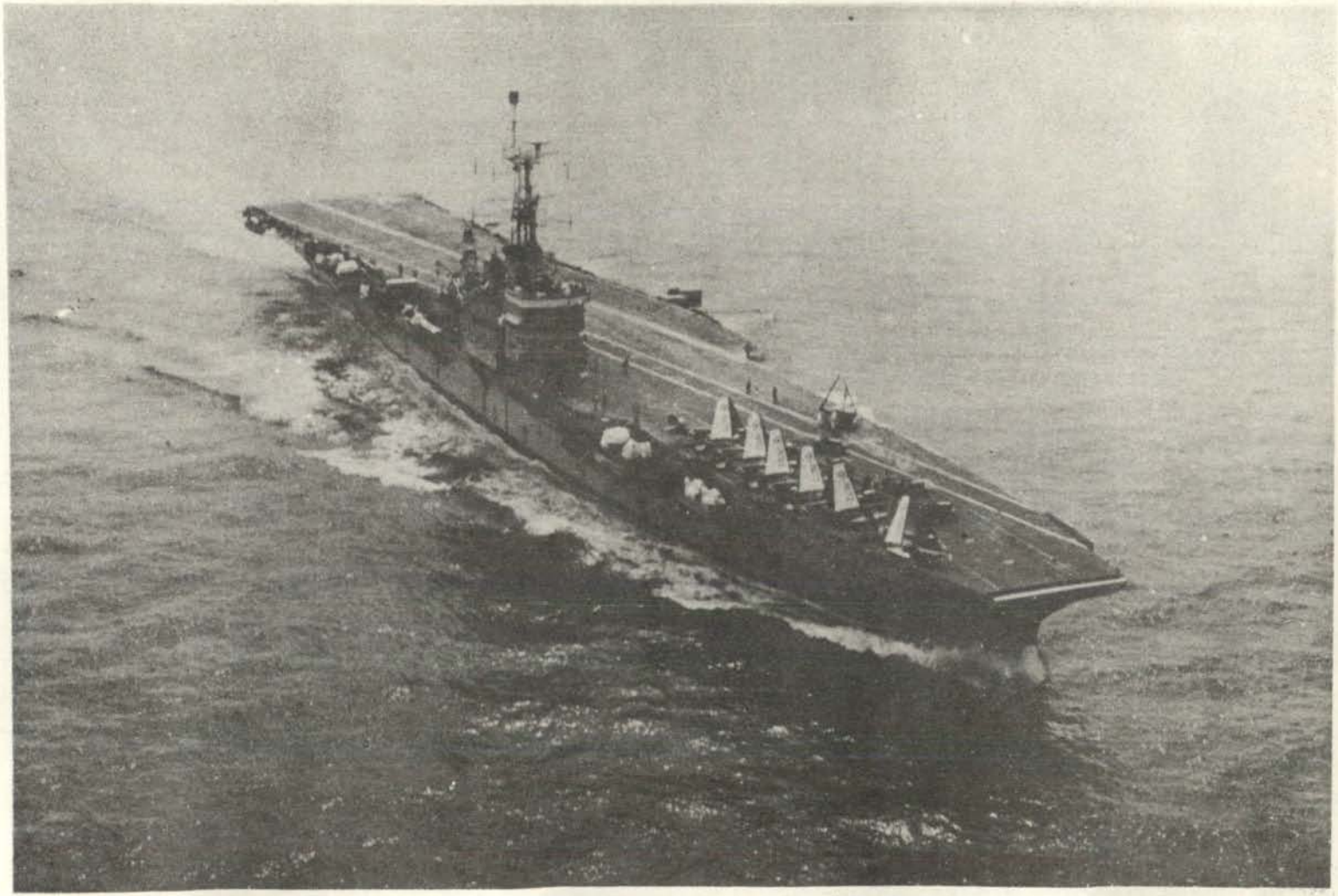
19.8 Performance of vessels

19.8.1 Design inadequacies and limitations

During the last two to three years of exploitation of type 'X' vessels in tropical waters, a large number of design inadequacies and limitations came to light. Continued manifestation of these design inadequacies had placed critical constraints on the operational deployability and availability of these vessels. The major shortcomings which limited the operational deployment were high indiscretion rate and limited patrol endurance caused by inadequate fresh water capacity, low capacity of airconditioning plant and degressed performance level of electronic equipment, sensors, batteries and generation system due to poor airconditioning. The Naval HQ took up the matter with the supplier in August 1989 and requested them to remove these inadequacies at the earliest. The Ministry stated in October 1990 that a number of technical teams of the supplier had visited the vessels and several agreements were in the final stage of conclusion. However, the design inadequacies are yet to be rectified (October 1990).

19.8.2 Defects in diesel generator of type 'Y' vessel

Failure of diesel generator of one of the type 'Y' vessels was noticed in March 1987. Investigations showed that the upper crank case body of the prime mover had cracked. Minute examination revealed that patch work repairs had been done earlier by the supplier. Replacement of the prime mover under



INS Vikrant

guarantee was claimed by Naval HQ from the supplier in March 1987. The claim was, however, not accepted on the plea that the defects occurred due to violation of regulations and improper maintenance. Thereafter, a technical board of officers was constituted by Naval HQ to investigate the causes leading to the failure of the diesel generator. This board concluded that the failure was due to blockage of internal lubricating oil passage. In view of the findings of the board, the supplier was again requested by Naval HQ in October 1987 for the free replacement of prime mover. However, the supplier had neither accepted the liability nor rectified the defect. Meanwhile, the damaged diesel generator was replaced in December 1987 by procuring a new one from the supplier at a cost of Rs.8.11 lakhs.

19.9 Fire on board a type 'Y' vessel

The second type 'Y' vessel, sailed to India in January 1987. Soon after leaving the foreign port, the vessel suffered heavy damage due to outbreak of fire in the laundry department. The vessel was towed back by the supplier for repairs. The repair of the vessel was undertaken by the supplier at a cost of Rs.45 lakhs. An amount of Rs.6.60 lakhs had also to be paid towards fire fighting assistance, diving assistance, cost of fuel/lubricants, etc. Besides the cost of repairs, the personnel of the vessel had to be paid cash allowance/foreign allowance to the extent of Rs.4.41 lakhs for the duration of their continued stay abroad.

The causes for the accident were investigated by the Indian side. One probable cause was held to be the burning of bleaching powder, as the Board of Enquiry could not rule out the possibility of that supply being calcium carbide. This fire caused a loss of Rs.56.01 lakhs. The Ministry stated in October 1990 that the Board which had investigated the causes of the accident had concluded that the responsibility could not be fixed on any individual.

20. Modernisation of INS Vikrant

20.1 Introduction

Indian Naval Ship Vikrant, an aircraft carrier originally launched in September 1945, was commissioned in the Indian Navy in February 1961. The accepted normal life of a ship of the type of Vikrant is 30 years. For ensuring the ship's operational effectiveness, it is necessary to carry out reconditioning and essential modernisation after a period of 13 years. This involves replacement of obsolete equipment, overhauling of machinery and updating of weapons, sensors and equipment.

20.2 Scope of Audit

The planning, management and execution of modernisation/refit programme of INS Vikrant, procurement, installation and commissioning of major systems and equipment were examined in audit. The financial management and adherence to the prescribed maintenance cum operational schedules of the ship were also looked into.

20.3 Highlights

- **The time taken for the scheduled repairs was considerably more than that prescribed. Further, the ship was given three long refits of 96 months against one refit of 24 months that was due during this period. Consequently, the opera-**

tional availability of the ship was only 52.42 per cent against the expected availability.

- **Due to failure to ensure timely supply of spares, machinery and equipment, the modernisation/ refit work under modernisation phase I had to be foreclosed which put constraints on the operational capabilities of the ship. Moreover, it had to be brought to the Dockyard for unscheduled repairs.**

- **Offloading of repair of turbine to a firm resulted in damage to the turbine and loss of Rs.18.78 lakhs on its repairs.**

- **Plant and machinery and associated spares worth Rs.74.37 lakhs were purchased without due regard to the actual requirement and status of the existing plant and machinery.**

- **There is need for Government to review and restructure procedures for timely implementation of the modernisation programme.**

20.4 Maintenance

A planned preventive maintenance of a ship is essential to keep her operationally effective during her life time. Naval Headquarters (HQ) had therefore promulgated an operation cum refit cycle for Vikrant.

An analysis of the time taken in the refits undertaken vis-a-vis the authorised time revealed that except normal refit (NR) all the refits were completed much beyond the prescribed time. Till November 1989 the ship had been given three long refits (LRs) of 96 months duration against one refit due of 24 months duration. Additionally, the ship had also been brought to the dockyard for unscheduled repairs/refits, costing Rs.3.73 crores, for 299 days during 1980 to 1989. Consequently, the operational availability of the ship was only 52.42 per cent against the expected availability.

The Ministry stated in November 1990 that the duration of a refit was continuously monitored and extended depending upon the work package and the extensions for delay were fully analysed and approved. The delays should, therefore, be counted only beyond the approved refit period. The Ministry added that for calculation of operational availability of the ship, the period of modernisation should not be taken into account for calculation of operational period. The fact remains that inability on the part of the dockyard to complete the refits within the prescribed maintenance periods resulted in the reduced operational availability of the ship; the periods of modernisation are already taken into account while determining operational availability of ships.

20.5 Modernisation (Phase I)

20.5.1 Planning

The staff requirement for reconditioning and modernisation was finalised by Naval HQ in January 1977 which was later revised in June 1977. The scope of modernisation covered mainly

- modification for operation of a mix of four different types of aircraft
- Improvement of command control and air defence capability including associated sensors

- replacement of obsolete weapons, electronic and communication equipment and
- refurbishment of main and auxiliary machinery and essential hull work.

The reconditioned ship was expected to be in operation for at least another 10 years.

Sanction for essential reconditioning and modernisation of Vikrant was accorded by the Government in September 1977 at a cost of Rs.13.98 crores. This was subsequently revised to Rs.14.29 crores in October 1979. The provision of revised weapon package was subsequently sanctioned in December 1980 at an estimated cost of Rs.13.23 crores thereby raising the total estimated cost of procurement of equipment, machinery and spares to Rs.27.52 crores.

20.5.2. Time frame

The necessity of the modernised and reconditioned ship was linked to the acquisition of aircraft 'S' which were expected to be available for embarkation on board by mid-1981. Consequently, an absolute directive was given that the refit of the ship should commence in January 1979 and be completed by December 1980. However, when it was realised that the delivery of a large number of major modernisation equipment would materialise only by the first and second quarter of 1981, the Naval Dockyard was given a time frame of three years to complete the job i.e. by December 1981.

20.5.3 Execution

The modernisation refit of Vikrant was to commence in January 1979 and be completed in December 1981 at a cost of Rs.46.70 crores, including the expenditure incurred by the Naval Dockyard, Bombay.

The ship authorities in their report on modernisation of phase I of Vikrant stated in August 1982 that the material procurement and availability did not keep pace with the refit activities. During the later part of the refit, the responsibility for providing some spares was shifted to the ship's staff. Due to the non-availability of the necessary spares in stock, the equipment and machinery could not be refitted in many cases. Moreover, orders placed on 34 foreign and 26 indigenous suppliers did not materialise fully by December 1981. Thus, the installation and commissioning of 19 major engineering and electronics equipment could not be completed due to non receipt of equipment/ spares. In a few cases, the equipment was just made functional to meet sailing commitments. The Ministry agreed in November 1990 that there was delay in completion of refitting some equipment on account of late receipt of stores and that defects observed during sailing were rectified during the self maintenance period (SMP).

20.5.4 Unscheduled refits

Immediately after completion of the modernisation refit in December 1981, a fresh work order was opened in January 1982 for rectification of operational defects and it was closed in April 1983 after incurring an expenditure of Rs.89.76 lakhs. Again a special refit at a cost of Rs.2.75 crores was given from April to October 1983 including completion of all outstanding work spilled over from the last modernisation refit. This is indicative of the fact that the modernisation was not completed in all respects in December 1981.

20.5.5 Non-utilisation of rotary convertors

Naval HQ placed an operational indent in September 1982 for procurement of four sets of 50 KVA rotary convertors which was sanctioned at an estimated cost of Rs.13.64 lakhs. A contract was concluded in the same month with firm 'D' for supply of the sets at a cost of Rs.10.96 lakhs excluding sales tax and excise. The sets were received between April and July 1984 and two sets were installed aboard Vikrant in May 1984. The remaining two sets, costing Rs.5.48 lakhs, were lying in stock. The matter for disposal or otherwise of these sets initiated in July 1989 by the Naval Dockyard was still under consideration of the Ministry (November 1990).

20.5.6 Avoidable expenditure on off-loading of repair work

Both the aircraft lift gear boxes of the ship were due for major overhaul during modernisation. The Naval Dockyard overhauled one of the gear boxes but the defects persisted. Sanction was, therefore, accorded in June 1982 to get it repaired through firm 'E' against proprietary article certificate at a cost of Rs.6.04 lakhs including Rs.0.48 lakh in foreign exchange. A contract was concluded with the firm in August 1982 to design, manufacture, install and commission the gear internals for second and third stage of ford and aft aircraft lifts gear boxes on a turnkey basis. The items to be supplied were to be warranted against defective material, workmanship and performance for 12 months from the date of satisfactory load trials on board ship.

The gear internals for both gear boxes were made ready by the firm during mid 1984. The aft lift gear box was, however, despatched to the firm for renewal of internals in mid 1985. It was received back in August 1985 after being refurbished with second and third stage internals. The load trials of the gear box were carried out in December 1985 but these were not witnessed by the representatives of the firm. Subsequently, joint trials with the representatives of the firm were carried out again and a final certificate of satisfactory trials was issued in March 1986. The aircraft gear box, however, failed in February 1987.

An expert team, which went into the circumstances of the failure suggested that the likely cause of failure was due to faulty heat treatment, manufacturing defects or material defects or a contribution of all these three factors. The Board also recommended that the other set of internals of the firm should not be used as replacement for any gear box.

The Naval Dockyard, however, did not take any action for rectification/ repair of the gear box under the warranty clause. Instead, another contract was concluded in February 1988 for defects rectification and renewal of damaged parts at a cost of Rs.13.71 lakhs. The work was completed in October 1988 and the aft lift gear box installed on board Vikrant in November 1988.

Thus, there was not only a delay in the overhaul of an essential equipment, but the Navy had also to incur an expenditure of Rs.13.71 lakhs for defect rectification.

20.6. Modernisation (phase II)

After her phase I modernisation, the ship could not operate aircraft 'S' at full load to their maximum radius of

operation. She was not equipped to store sophisticated equipment, which had been ordered for procurement. The workshops and bays of the ship were inadequate to effectively maintain the aircraft 'S' and helicopter 'H'.

A proposal was initiated in May 19 5 for phase II modernisation of the Vikrant at a cost of Rs.13.50 crores including Rs.2.33 crores in foreign exchange. The proposal was approved by Government in January 1986. The salient features of the modernisation programme were as under:

- fitment of a ski jump
- magazine conversion equipment for sophisticated armament
- installation of communication equipment
- refurbishing of machinery/equipment consequential to normal repair/refit of the ship.

The phase II modernisation refit was planned to be carried out by Naval Dockyard, Bombay from end 1986 and completed within a period of 18 months. However, after a review of the key activities it was decided in May 1986 to commence it from June 1987 and complete it by May 1989 whereafter a period of five months was to be allowed for trials, setting to work, testing and tuning etc. After completion of modernisation work under phase II, continued reliable operation of the ship was expected until mid 1990s.

20.6.1 Command and control system

Although the phase I modernisation provided for installation of indigenous computerised command and control system (system), it could not be installed owing to the unsatisfactory progress in its development by the Department of Electronics (DOE). The ship was, therefore, fitted with a non-computerised system meant for another ship as an interim measure at a cost of Rs.104.06 lakhs. The command in this system was fractionally slower. To overcome this deficiency, Government approved in 1984 procurement of a computerised system at a cost of Rs.6.5 crores. In February 1987, the requirement was further reviewed by Naval HQ and it was decided to divert the system contracted for Vikrant to another ship. This was approved by Government in September 1987. In the absence of the computerised system, the command continued to be fractionally slower. (November 1990)

20.6.2 Infructuous expenditure on radar interface units

In March 1985, Ministry of Defence placed a letter of intent on a state Public Sector Undertaking (PSU) for manufacture of one radar interface unit (RIU) alongwith spares and documents for providing interface radar and computerised command and control system for Vikrant. An advance payment of Rs.0.92 lakh was made to the firm as per the letter of intent. Government sanction for procurement of RIU at a cost of Rs.4.20 lakhs was issued in September 1986. The Ministry agreed that due to diversion of the system, the requirement of RIU did not exist for Vikrant. It added that a case to revalidate the sanction and reappropriate the RIU which had already been manufactured by the PSU, for another class of ships was under their consideration (November 1990).

20.6.3 Non-installation of automatic wind finding system

For ensuring operational effectiveness and flight safety of aircraft 'S', an automatic wind finding system was considered inescapable by Naval HQ in May 1983 . Sanction was accorded in June 1985 for procurement of the same from a foreign firm at a cost of Rs.28.70 lakhs. The system was received on board Vikrant in November 1985 but could not be installed in the absence of cable details and system's drawings. Although the drawings were revised in early 1987, the system was not installed on board Vikrant but it was transferred to the second aircraft carrier in October 1988. In March 1989, Government sanctioned the procurement of one indigenous system equivalent to the system imported earlier from a state PSU at an approximate cost of Rs.54.30 lakhs. However, no formal order has been placed so far. The Ministry stated in November 1990 that the order for the wind finding system was being processed and it was unlikely to be available before December 1991. It added that the requirement was being met by obtaining the data from analysed upper wind charts. Thus not only did the system imported in June 1985 at a cost of Rs.28.70 lakhs in foreign exchange remain unutilised till October 1988, but Vikrant had to continue to operate without the system which had been considered inescapable as early as in 1983 for operational effectiveness and flight safety of aircraft 'S'.

20.6.4 Air-conditioning plant

Mention was made in paragraph 50 of the Report of Comptroller and Auditor General of India, Union Government (Defence Services) for the year 1985-86 about non-utilisation of an air-conditioning plant costing Rs.44.28 lakhs procured for INS Talwar. The Ministry had stated in November 1986 that the airconditioning plant was common with other ships in service and would be used for ships having similar plant. The work package for modernisation of Vikrant accordingly envisaged the installation of the unutilised plant for providing additional airconditioning to the ship. Naval HQ, however, decided not to install ex-Talwar airconditioning plant in Vikrant on grounds of mismatch with the frequency of power supply aboard the ship. Instead, two indents were raised in June and September 1987 for procurement of two airconditioning plants at a cost of Rs.63.38 lakhs and Rs.40.00 lakhs respectively. While the first indent was raised against Government sanction for modernisation of the ship, the later one was raised by exercising delegated financial powers of Naval HQ for replenishment of stocks for replacement of existing plant(installed in 1975) by declaring it as Anticipated Beyond Economical Repair (ABER). Naval HQ concluded a contract with an indigenous firm in August 1988 for supply, installation and commissioning of two sets of airconditioning plant at a total cost of Rs. one crore. The work contracted to be completed by March 1989, had not been completed by the firm (November 1990).

The Ministry intimated in November 1990 that the fitment of ex-Talwar plant although attempted, could not be used because of its incompatibility with Vikrant power system. Nevertheless, the fact remains that the airconditioning plant procured in early eighties at a cost of Rs.44.28 lakhs and proposed to be utilised for ships having similar plants remained unutilised from its date of purchase.

20.6.5 Loss due to offloading of repair of turbine

A contract was concluded with firm 'J' in March 1988 by Naval Dockyard for the in situ repairs of LP turbine at a cost of Rs.10.99 lakhs. While the repair to the aft LP turbines were being undertaken by the firm, an accident took place in April 1988 resulting in damage to aft LP turbine. HQ Western Naval Command, Bombay constituted a Technical Board, to assess the extent of damage, and a board of inquiry to investigate circumstances leading to the damage. Based on the recommendation of Technical Board, the repair of damaged aft LP turbine rotor was offloaded in July 1988 to a PSU at a cost of Rs.20.09 lakhs, revised to Rs.25.97 lakhs in August 1988. The work was completed by the PSU in October 1988 at a cost of Rs.27.97 lakhs. The repair work on aft LP starter was undertaken by Naval Dockyard at a cost of Rs.1.80 lakhs.

The Board of Inquiry had attributed the damage to the aft LP turbine to the negligence on the part of the firm 'J'. Naval HQ recommended cancellation of contract with firm 'J' and recovery from the firm of the cost of repairs and all the associated work on the aft LP turbine arising as a result of damage as stipulated in the contract. The recommendations of board of inquiry was approved by Naval HQ in December 1988. Accordingly, the contract concluded with firm 'J' was terminated in January 1989. The advance of Rs.2.75 lakhs paid to the firm was refunded in July 1989. Thus, offloading of repair of LP turbine to the firm led to damage to the turbine and loss of Rs.18.78 lakhs on account of repairs including the amount spent by the Naval Dockyard.

The Ministry intimated in November 1990 that a claim for damages for Rs.2.80 lakhs had been preferred in February 1990 against the firm.

20.6.6 Procurement of unsuitable starters

Foreign purchase cell (FPC) at Naval HQ concluded five contracts with a foreign firm 'O' in December 1987 for supply of 10 number each of motors and starters at a total cost of Rs.42.36 lakhs. These motors and starters were received in October 1988. While the motors could be used, the starters procured at a cost of Rs.13.86 lakhs were found to be unusable due to their unsuitable size.

The Ministry stated that the supplier had agreed to take back the starters and refund the cost thereof. The Ministry, however, did not intimate whether this had been done by the supplier (November 1990).

20.6.7 Main engine spares

Naval HQ placed an indent on Foreign Purchase Cell (FPC) in October 1987 for supply of three types of main wheel bearings. FPC concluded a contract in February 1988 for supply of the bearings at a cost of Rs.4.18 lakhs in foreign exchange. The items, though received in March 1989, could not be identified or brought on charge for want of proper identification marks. In the meantime the repair works of main engine were completed by remetalling of old bearings. Thus spares worth Rs.4.18 lakhs procured for repair of main engine remained unutilised in stock. The Ministry stated in November 1990 that the bearings would be used at the next available opportunity to replace the existing refurbished bearings.

20.6.8 Main lubrication oil cooler

FPC at Naval HQ concluded a contract in February 1988 with a foreign firm 'K' for supply of four main engine lubrication oil coolers at a cost of Rs.13.15 lakhs in foreign exchange. These coolers were received in Naval Dockyard in October 1988 and issued to Vikrant during October/December 1988. However, only two coolers were fitted on the ship and the remaining two coolers costing Rs.6.57 lakhs remained unutilised as prior to receipt of these coolers, the ship had been refurbished and fitted with two old coolers. The Ministry intimated in November 1990 that the new coolers would be fitted at an opportune time.

20.7 Monitoring

There was no centralised system of control and monitoring of procurement of stores, equipment and systems required for modernisation refit. Procurements were made by different directorates of Naval HQ under delegated financial powers when the modernisation work was in progress. Evidently, there is a need for the Government to review and restructure procedures for better management and financial control to ensure timely completion of modernisation plans of ships within the sanctioned cost.

21. Naval Armament Depots

21.1 Introduction

The Indian Navy holds various types of armament and ammunition to keep the naval fleet in a state of operational readiness. The Naval Armament Stores Organisation (NASO) is responsible for providing the necessary logistic support in respect of armament and ammunition requirements of the Indian Navy. The stores procured are stocked in the Naval Armament Depots (NADs).

21.2 Scope of Audit

The functioning of five depots was examined in Audit during 1989 to ascertain the infrastructure created and the utilisation of assets and manpower. Besides, procedures followed for procurement of armaments and cost control on production to ensure optimum efficiency were also reviewed.

21.3 Organisational set up

The Directorate General of Armament and Ammunition Stores (DGAS) at Naval Headquarters (HQ) looks after the provisioning aspects in respect of armament and ammunition stores as per the policy directives of the Government. The stores are received and stocked in various Naval Armament Depots. Each depot has been assigned responsibility to hold different types of such stores. The main functions of the depot are to receive, stock and issue armament and ammunition to the naval fleet; inspect, repair, assemble and fill up ammunition; manufacture and repair armament stores.

21.4 Highlights

- **Depots had not maintained outside safety distances which involved undesirable risks.**

- **Storage of explosives in excess of the prescribed limits was noticed in all the five depots and the excess percentage of stocking of explosives ranged from 93 to 667 percent.**

- **A jetty constructed in April 1966 at a cost of Rs.2.04 crores could**

not be put to use. Consequently another jetty which was considered essential for construction in 1976 was still at the planning stage and in the meanwhile the estimated cost of construction had gone up substantially from Rs.8.50 crores in 1976 to Rs.92.50 crores in 1985. Failure to firm up the requirement for the jetty for over last 14 years would lead to further cost escalation besides continued denial of essential facility thereby imposing serious operational constraints on Navy in handling explosives at sea.

Storage and workshop facilities for certain armament inducted into service from 1986 onwards were yet to be provided as the setting up of these facilities was not synchronised with the planned induction. Consequently, the armament continued to be stored in makeshift accommodation.

Considerable accumulation of repairable stores was noticed in certain depots.

There was no systematic review of manpower requirements as the staff is sanctioned on adhoc basis and the depots function with the manpower sanctioned 8-19 years back despite increase in the volume and variety of work handled by them over the years. The proposals for increase in staff recommended by NSEC about two to five years back though accepted still await implementation.

Depots do not have a proper system of periodical review of the holding of machinery vis-a-vis actual requirements to identify surplus or additional requirements. Five machines costing Rs.6.35 lakhs could not be put to use since their procurement between September 1987 and October 1988, for want of trained manpower and proper workshop facilities etc. 21 machines declared beyond economical repairs in depots B and D were awaiting disposal and replacement from 1986 onwards.

- **None of the depots had a system of evaluation of production planning and control on cost.**

- **Although pay scales of Government employees stood revised from January 1986, the recovery for use of Government transport between the depot and residence of the employees was still being made at the rates fixed in 1982 in two depots to the disadvantage of the State.**

21.5 Depot planning and lay out

21.5.1 Safety distance

The handling and storage of explosives in the Defence Services are governed by the provisions of the Indian Explosives Act, 1908, read with the Explosives Rules 1983 and the Storage Transportation and Explosive Committee Regulations (STEC). The regulations provide for maintenance of certain safety distance between the store houses within the depot (inside safety distance) and the safety distance to be maintained by the depots from the civil population (outside safety distance). It was observed that the prescribed outside safety distance had not been maintained due to the growth of population. This involved undesirable risks. The Ministry stated in November 1990 that while planning future depots, the acquisition of the entire

land falling within the outside safety distances is being contemplated.

21.5.2 Availability of land

Depots 'A' and 'C' were short of land. Details were not available for depot 'E'.

A Board of officers convened by Depot 'A' in July 1988 to determine the land required to maintain safety distance, demarcated 37.7 acres of land to be acquired. The State Government agreed in 1987 to the issue of no objection certificate for acquisition of the land subject to the condition that there would be no restriction on civil use of land not acquired by the Navy. Since, this condition was not acceptable to the Navy owing to safety requirements, the State Government suggested two alternative sites which were at a distance of 8 and 15 kilometers away from the present location. In their reply received in November 1990, Ministry of Defence (Ministry) stated that the alternative site suggested by the State Government has not been agreed to by the Naval HQ and steps were being taken to assess the details of land required to be notified under the Indian Works Defence Act 1903 prohibiting unrestricted growth of population around the depot.

A Board of officers assembled in February 1971, assessed an additional requirement of approximately 524 acres of land for depot 'C' to provide for prescribed safety distance as well as for future expansion of the depot and security measures. The Board recommended that 430 acres be covered by a notification to be issued under the Indian Works Defence Act 1903 to prevent the growth of structures around the depot. The remaining 94 acres was proposed to be acquired by the Navy. Sanction for acquisition of 42 acres was accorded by the Government in September 1976 and payment of Rs.10 lakhs was made for the land in October 1986. The land however, has not been taken over because of large scale encroachments (November 1990).

21.6. Storage accommodation

Explosives of various types are required to be stored in accordance with storage ceiling laid down in STEC Regulations.. However, storage of explosives in excess of the prescribed limits was observed in all the depots. The excess percentage of stocking of explosives ranged between 93 and 667 percent. The dispensation from the observance of the prescribed limit by the depots was sanctioned by Naval HQ from time to time. This situation could only be solved after establishment of new depots or provision of additional accommodation. However, even in cases where the requirements for accommodation were identified, there were delays in completion of the facilities as the following instance would reveal.

Depot 'B': No permanent facilities existed for repair and overhaul of mines at depots B and C and this work was being carried out under make shift arrangements. In addition certain mines received by depot 'C' were transferred to depot 'B'. A Board of officers had recommended in April 1985 the construction of a workshop and storage accommodation at depot 'B' alongwith necessary services at a cost of approximately Rs.79 lakhs. Considering the urgency expressed by the users, the Board had recommended the execution of work as an operational work. Sanction for the same was accordingly issued by Naval Command 'X' in August 1985. The contract was concluded in July 1986 for execution of the work to

be completed by August 1987 at a cost of Rs.58.80 lakhs. Although the work was completed after a delay of over 17 months in January 1989, it has not been taken over for want of completion of test of the airconditioning plant (November 1990). In the absence of the facilities, repair of mines continued to be carried out under make'shift arrangements at depot 'C'.

21.7 Works services

There were abnormal delays in sanction and execution of essential works services with the result that adequate storage and workshop facilities were not available in respect of new weapons and systems inducted into service. In one case the assets created were not being put to the intended use. Details are furnished below:

21.7.1 Construction of explosive jetty at depot 'C'

A jetty was constructed in April 1966 at a cost of Rs.2.04 crores at Depot 'C' for ammunitioning and deammunitioning naval ships directly. The non-utilisation of this jetty due to accumulation of silt in the basin had been commented upon in paragraph 23 of the Audit Report, Union Government (Defence Services), 1968. The Ministry of Defence had informed the Public Accounts Committee in September 1969 that capital dredging would be carried out in the basin and once the dredging was completed, the jetty would be put to full use. Further developments were reported in paragraph 45 of the Report of the Comptroller and Auditor General of India, Union Government (Defence Services) for the year 1975-76 wherein it was brought out that not only was no dredging carried out, but also the jetty itself had developed serious defects. The jetty was, therefore, put to limited use for transporting ammunition and cargo through barges from depot 'C' to small ships.

Since an explosive jetty was essential for handling explosives received, construction of another jetty was under consideration of Government from 1976 onwards. An Expert Technical Committee constituted in April 1976 recommended in December 1976 construction of the explosive jetty at depot 'C'. A provision of Rs.8.62 crores was made in the Naval budget for the plan period 1979-84. Two sanctions were accorded in July 1979 and May 1980 for carrying out preliminary field studies at a cost of Rs.0.20 lakh by a civil establishment and preliminary investigation for feasibility and design study by a Port Trust at a cost not exceeding Rs.30 lakhs. Sanction for the construction of the jetty was, however, yet to be issued even after 14 years since the projection of the requirements (November 1990). The Ministry stated in November 1990 that during the last three years of 1985-90 plan no funds could be allocated for the construction of the jetty due to resource crunch. In the meantime, the estimated cost of the jetty had steadily increased from Rs.8.50 crores in April 1976 to Rs.92.50 crores in October 1985.

The handling of explosives at the port therefore, was restricted to consignments not exceeding 500 ton per ship and that too through midstream transfers. The explosives are discharged into barges and transported to the jetty at depot 'C' for further despatch to destinations. Since this system was not suitable for loading/unloading of heavy and sophisticated weapons, handling of such weapons was undertaken in the Naval dockyard which was unsafe and hazardous both to the dockyard as well as the port in the event of any mishap.

21.7.2 Storage and workshop facilities for armaments of helicopters

Based on the recommendations of Board of officers in May 1986, sanction was accorded by Naval Command 'X' in October 1986 for the creation of facilities for preparation of torpedoes at depot 'B' as an operational work and covering sanction was accorded by Naval HQ in February 1989 at an estimated cost of Rs.1.17 crores.

Contract was concluded in January 1988 for execution of the works and it was scheduled to be completed by February 1989. The date of completion was extended to December 1989. Another contract concluded for airconditioning work for the building in June 1989 was scheduled to be completed by July 1990. While the works scheduled for completion in February 1989 were yet to be completed (November 1990) there was delay of 14 and 31 months in conclusion of contracts for works services and airconditioning respectively for a work of urgent necessity. Owing to non-synchronisation of the creation of infrastructural facilities with the receipt of armament, torpedoes and spares, they had to be stored from November 1986 onwards in the existing storage facilities which did not conform to the conditions specified by the manufacturers.

21.8 Depot activities

21.8.1 Accumulation of repairable stores

One of the functions of the depot is to repair armament stores speedily so that the requirements of the fleet can be fully met. Considerable accumulation of repairable stores was, however, noticed in depot 'A', 'B' and 'C'. The Ministry stated in November 1990 that due to increased fleet strength coupled with shortage of manpower the repair efforts could not cope with the accumulation of repairable stores and accumulations were in fact increasing.

21.8.2 Stock verification

Naval regulations prescribe a biennial stock taking of all items by a process of continuous stock verification. It was seen that depot 'C' did not carry out stock verification of certain mines, torpedoes and missiles which were received from 1986 onwards on the plea that there were no issue of the stores. Ministry, however, stated in November 1990 that the stock verification of some of the items was not carried out due to shortage of staff and also as the receipt inspection had been carried out only recently. It also added that necessary directives have now been issued to carry out stock verification as per regulations.

21.9 Manpower

21.9.1 Staff strength

There had been considerable increase in the work load of the depots due to induction of several new weapons and ammunition of improved technology and sophistication requiring specific to type repair and maintenance facilities besides storage needs and trained manpower. It was observed that no systematic reappraisal of manpower requirements had been carried out at the time of new inductions except for adhoc increase in a few cases. Resultantly, the depots continue to function on staff complements sanctioned 8-19 years back. The proposals for the review of staff complement were made by the depots more than two to nine years ago and the same were scrutinised and rec-

ommended by the Naval Standing Establishment Committee (NSEC) more than two to five years back. Ministry stated in November 1990 that based on the reviews undertaken by the NSEC, approval in principle has been accorded in some of the cases but sanction could not be issued on account of resource crunch.

The Ministry stated in November 1990 that the increase in depot workload on account of new inductions has affected the functioning of the depots. The Ministry added that depending upon the priorities, jobs were undertaken by redeployment of staff in order to meet the essential requirements by according lower priority to some of the store keeping and maintenance functions. The fact remains that the depots were thus handicapped in carrying out their assigned task which lead to accumulation of repairable arisings and their inability to effect necessary cost control functions.

21.9.2 Payment of overtime

The shortages in staff also led to payment of overtime which during the years 1985-86 to 1989-90 was Rs.4.42 crores constituting 11.20 percent of the total pay and allowances of all the depots.

The Factories Act 1948 stipulates that the total overtime hours worked by an employee governed by the Factories Act should not exceed 75 hours in a quarter. It was observed that in all the depots excepting depot 'A', a large number of employees were paid overtime far in excess of the prescribed limit of 75 hours a quarter and the excess of overtime ranged between 46.5 hours and 685 hours in a quarter.

Depot 'C' stated in March 1990 that adequate manpower not commensurate with the increase in the inventory and issue of ammunition stores to ships at short notice necessitated payment of overtime which at times exceeded the limits prescribed in the Factories Act. Depot 'D' stated that in view of the nature of classified cargo handled and to minimise financial repercussions, handling operations had to be carried out in two shifts on all days including holidays and it was not possible to curtail the overtime within the ceilings laid down by the Factories Act. The Ministry stated in November 1990 that due to inadequacy of staff, exemption was sought from the Government for exceeding the limit for overtime as prescribed in the Factories Act but it has not been agreed to.

21.10 Holding and utilisation of machinery

Depots hold a large number of plant and machinery for undertaking various production repair and maintenance jobs falling under their area of responsibility. It is of vital importance to periodically review the requirement of machines by surveying the current holdings, disposing of unserviceable or obsolete machines and seek replacements or updated versions so that the resources of the depots are utilised to the optimum to fulfil their desired role. It was, however, observed that defective machines were not disposed off and replaced. Some interesting cases in the utilisation and disposal of machines are discussed below:

Depot 'A': Against a sanction accorded by Government in July 1986, five machines for setting up of engineering

workshop facilities in the depot to manufacture components for a gun were procured at a cost of Rs.6.35 lakhs. These were received in the depot between September 1987 and October 1988. The machines could not be put to use for want of accommodation and machine operators. Two of these machines costing Rs.2.70 lakhs were transferred to depots 'C' and 'D' in 1990. The Ministry stated in November 1990 that sanction was being accorded for the transfer of the remaining three machines to other depots. Thus prima facie the purchase of these machines was not warranted and the investment of Rs.6.35 lakhs has remained largely unproductive so far (November 1990).

Depot 'B': Out of the 16 machines of different types held in the depot, eight were declared beyond economical repairs by a Board of officers in June 1986 and another one in December 1986 due to fair wear and tear. The Board recommended their replacement through fresh procurement. These machines were yet to be disposed off and replacement obtained. The Ministry stated in November 1990 that the requirement of the essential machinery was being considered for effecting replacement.

Depot 'D': Five machines were recommended for disposal and replacement by a Board of officers, held in March 1989, as the machines had outlived their useful life. The machines were, however, yet to be replaced. The Ministry stated in November 1990 that procurement action was in progress.

Depot 'E': Three auto cranes purchased from a foreign country between June and December 1988 were lying unutilised in the depot for want of english version of maintenance manuals. The Ministry stated in November 1990 that matter has been taken up with the supplier for the supply of the same.

21.11 Absence of control on production and cost

The depots also handle various production jobs like manufacture of components and armament stores, manufacture of components for repair and maintenance of various armament and ammunition handled by them, medium repair and preparation of torpedoes for issue to ships and aircraft, etc. In order to carry out the production jobs, various types of workshops have been established in the depots with a large number of plant and machinery. It is essential that the depots have a proper system of production planning and cost control system to ensure that the available resources are utilised optimally with due economy.

None of the depots had a system of evaluation of production planning and control over cost. Though jobs undertaken in most cases, were of a repetitive nature, no standard estimates for man/machine hours and materials required for the job to enable comparison between the actual time taken, material consumed, processes involved and that estimated were available. Though the depots have a planning, production and control mechanism to monitor the progress of work, there is no machinery for verifying the cost effectiveness of the production in progress. The Ministry attributed this deficiency to lack of manpower.

21.12 Non-revision of rates for use of Government transport

Government sanctioned in April 1951 provision of transport for civilian employees of depot 'E' between the place

Naval Dockyard, Bombay

of residence and the depot on payment of the rates prescribed therein. The rates were prescribed with reference to the pay scales then existing and were revised upwards in May 1970 and February 1982.

Nine vehicles are deployed by the depot daily for the conveyance of the civilian employees and each driver of the vehicles had invariably to be paid overtime for three hours daily. While the charges recovered for the use of the transport during 1988-89 ranged between Rs.6,300 and Rs.7,000 per month, the overtime paid alone amounted to Rs.12,000 per month.

Despite the revision in scales since January 1986 and the steep increase in cost of fuel over the years, the rates fixed in February 1982 had not been revised (November 1990). Similar position existed in the case of depot 'D' as well.

22. Naval Dockyard, Bombay

22.1 Introduction

The Naval Dockyard, Bombay, covers an area of 24 hectares and employs about 14,000 persons. The dockyard is utilised for carrying out the works relating to maintenance and refit, conversions, alterations and modifications to naval ships. It also undertakes work of other departments and private bodies on payment basis subject to availability of capacity.

22.2 Scope of Audit

A review was carried out in Audit to examine the facilities, planned and created in the naval dockyard, Bombay from 1985 and their utilisation. The review also covers the maintenance aspects of naval fleet, financial arrangement and cost control.

22.3 Organisational set up

The dockyard is headed by an Admiral Superintendent in the rank of Vice Admiral and is under the administrative control of the Western Naval Command. The repair/refit of ships is undertaken with reference to the long term and short term plans finalised in consultation with Naval Headquarters.

22.4 Highlights

- **The heavy internal combustion engine shop envisaged to be completed by May 1984 though completed in June 1990 was not fully functional for want of completion of the engine test house. Further, galvanising facility required to be created by the end of 1978 although commissioned in February 1987 at a cost of Rs.23.18 lakhs could not be made fully operational till March 1990.**

- **Due to delay in the commissioning of airconditioning and refrigeration shop, the planned overhaul of equipment had to be offloaded to trade at a cost of Rs.18.15 lakhs.**

- **75 per cent of the planned refits during the period from 1985 to 1989 could not be completed within the approved time.**

- **The annual statement of works and production accounts did not exhibit a true account of expenditure incurred and work actually carried out. This did not, therefore, serve any meaningful purpose.**

- **Cost of work done on other ships by the dockyard amounting to Rs.1.73 crores had not been recovered.**

- **There was evidence of shortfall in the utilisation of the dockyard dredging fleet. Moreover, the maintenance of the dockyard dredgers was cost prohibitive.**

22.5 Setting up of workshops

Between December 1979 and March 1987, the Ministry of Defence (Ministry) sanctioned the setting up of three workshops viz. heavy internal combustion engine shop, air conditioning and refrigeration shop, and electroplating and battery repair shop. The position of setting up of these three workshops is discussed below:

22.5.1 Heavy internal combustion engine shop (HICE)

The repair facilities existing at the dockyard could handle only light engines upto 120 Horse Power (HP). There were approximately 335 engines/ generators of 120 HP and above fitted on various ships. There were also no facilities available for testing of these engines after repair. Thus, not only had repair work to be done on board in situ, defects noticed during trials could be rectified only after bringing the engines back to the shop. Thus, the repair work became time consuming and resulted in low operational availability of ships. In order to overcome the difficulty, Ministry sanctioned the setting up of HICE shop including an engine test house in November 1980 at a cost of Rs.5.18 crores. The work was to be completed by May 1984. When the detailed planning for execution of the shop was commenced in 1981-82, it was decided to cater for a new family of heavy duty engines which necessitated revision in its cost. Ministry's approval was obtained in April 1985 for the revision of cost to Rs.14.09 crores with date of completion as March 1989. While the workshop facilities were completed and made fully functional by June 1990, the engine test facilities were yet to be completed. The Ministry stated in November 1990 that the small engine test house was likely to be commissioned by December 1990, while planning work for the large engine test house had already commenced and the work was likely to be completed by December 1991. Thus, even after setting up of engine repair facilities, no facilities existed for testing of engines.

22.5.2 Air-conditioning and refrigeration shop

Sanction for the setting up of air conditioning and refrigeration shop was accorded by the Ministry in December 1979 at a cost of Rs.1.11 crores and the workshop was to be set up by 1982-83. The workshop building was completed and was handed over to the users only in February 1987 but without the complete air conditioning plant. The air conditioning system was taken over by the dockyard in June 1988. Ministry stated in November 1990 that the shop was commissioned in February 1987 and most of the equipments had been installed and no offloading had been resorted to thereafter. As regards delay in completion of the workshop, Ministry added that the requirement of equipment to be installed in the shop had to be revised in April 1984 due to certain inadequacies. Nevertheless, due to delay in commissioning of the workshop, the planned repair/ overhaul of equipments had to be off loaded to trade at a cost of Rs.18.15 lakhs during the period 1984-85 to 1986-87.

22.5.3 Electroplating and battery repair shop

In April 1972, Ministry sanctioned an electrochemical unit for the dockyard for reclamation of worn out machinery parts. The equipment procured at a cost of Rs.2.27 lakhs between November 1974 and May 1975 could not be installed for want of neutralisation plant. Naval Headquarters (HQ) had stated in December 1978 that this plant had been included in the civil works sanctioned by the Naval Command in January 1978 at a cost of Rs.15.89 lakhs, but this sanction was cancelled as the shop was also intended to cater for the repair need of certain new ships subsequently acquired from abroad which required an integrated electroplating and battery charging facility. Thereafter, fresh sanction was accorded by the Ministry in March 1987 for electroplating and battery repair shop at a cost of Rs.6.23 crores (Rs.2.86 crores for civil works and Rs.3.37 crores for equipment). The civil works were commenced in January 1989 after a delay of nearly two years.

The Ministry stated in November 1990 that during execution of civil works a number of underground obstructions like HT cables and water supply pipe line were detected which required diversion for making place for pipes. At the time of drilling of pipes for the building work a number of boulders were found in the area as the site of the shop happened to be a bend and adjoining area having been reclaimed in the past. As those site constraints added to the delay in the progress of the civil works, the civil works were expected to be completed by December 1990. Evidently, adequate study of ground conditions had not been made before siting the shops. The progress in procurement of equipment was however, only 20 percent. (November 1990).

Meanwhile, in August 1985, Ministry sanctioned creation of interim facilities for the electroplating shop at a cost of Rs.84.01 lakhs. The building was completed in December 1988 and the interim electroplating facility, commissioned in March 1989, was taken over in August 1989. However, the electrochemical equipment procured in 1974-75 was not installed in the workshop and the same was disposed off in March 1987. The Ministry stated in November 1990 that pending approval and creation of the main electroplating facility which required an in depth and critical study interim facility had to be sanctioned. It further added that the equipment procured at a cost of Rs.2.27 lakhs had to be disposed off as it did not meet the requirement even partially.

22.6 Refit and repair of ships

The operational availability of a ship is linked with the facilities available in the Naval dockyard for undertaking repairs and refits according to the prescribed refit cycles and spans. The cycle includes certain number of short refits (SR), normal refits (NR) one medium refit (MR) and a long refit (LR) depending on the type of ship.

A study of the refits carried out by the dockyard during 1985-1989 with reference to the annual refit programmes issued by the Naval HQ revealed that the time taken by the dockyard to complete the refits was much more than the planned periods for different type of refits as indicated below:

Type of refit	No.of refit planned	No.of refit completed in time	Time taken in excess of time planned by NHQ				Remarks
			upto 25 per cent	25 to 50 per cent	50 to 100 per cent	100 per cent and more	
Short	80	24	28	7	6	15	
Normal	32	5	13	2	7	4	one not carried out
Medium	10	2	3	2	2	1	
LR	2	-	1	1	-	-	

Thus out of 124 refits of various types 75 per cent refits could not be completed within the planned periods. The Ministry attributed the excess time taken to lack of spares, material, drydocking constraints etc.

Delays of refits due to lack of spares: Though long/medium refits are required to be planned one to three years in advance, delays due to non-availability of spares and equipment in time were noticed in the following cases.

INS Deepak: Long refit of the ship was to commence in August 1982, but the work package was finalised only by mid 1982. Thus a large number of imported auxiliaries having a long lead time of two to three years could be made available only in early 1985. In the meantime, the ship had to be given a normal refit in August 1982. The long refit could thus be commenced only in March 1985 and was completed in March 1987. Had the long refit commenced by the due date, the normal refit given in August 1982 could have been avoided.

INS Gaj: Long refit of INS Gaj was due in September 1983. Due to non-availability of equipment/ material required for the refit, the same could be commenced only in November 1985 and was completed in June 1987 against the scheduled completion in October 1986. Even then, certain planned additions and alterations could not be completed and certain equipment were boxed up with old spares to avoid further delay. While the lack of equipment and spares delayed the refit, it was also noticed in Audit that out of 486 valves procured at a cost of Rs.10.44 lakhs, only 93 valves costing Rs.2 lakhs were actually used for the refit. The rest were returned to Material Organisation as the same were found leaking. Old valves were, therefore, repaired and fitted by the dockyard. As the valves were specific to type, chances of utilisation of the remaining 393 valves costing Rs.8.44 lakhs in the near future are remote.

22.7 Financial management

22.7.1 Cost control

In August 1974, Government issued orders condoning the non-preparation of estimates in respect of jobs undertaken by the dockyard upto June 1974 and outlined a procedure to be followed with effect from July 1974 as a first step towards utilising the existing cost accounting system as a tool towards effective cost and management control and it was to be reviewed after two years. The procedure envisaged comparison of estimated mandays and material as well as cost thereof for each work centre, system/subsystem with those actually utilised.

While examining the implementation of the cost accounting instructions, it was noticed that comparison of material estimates vis-a-vis material used was carried out upto December 1977 but in no case was quantitative comparison of material estimates with the material actually consumed ever made. The Ministry stated in November 1990 that no fully geared up cost accounting sections existed in the dockyard to undertake the task envisaged. It added that the dockyard was constantly analysing the material and labour estimates based on actual booking for identical jobs and, therefore, the cost control was indirectly achieved though no quantification was yet possible. However, as under the existing method no meaningful analysis of variations between the estimates and actuals was being carried out, the effectiveness of cost control in the dockyard could not be established.

22.7.2 Delay in preparation of annual production accounts

A consolidated tabulation (cost card) showing monthly as well as total expenditure on each work order is required to be prepared from labour, material and miscellaneous abstracts prepared by the dockyard each month so that the monthly cost card is ready by the end of the month following that to which it relates. The data in cost cards from April to January could be used for determining the fixed and variable overhead rates for the ensuing year and it also serves as a management tool. However, such tabulations had not been prepared in time which resulted in delay of up to two years in preparation of annual production accounts. The Ministry stated in November 1990 that the procedure would be followed up with the Controller of Defence Accounts, Navy (CDA-N) in future.

22.7.3 Adoption of unrealistic data in the production accounts

A study of the annual statement of works and production accounts of the dockyard from 1983-84 to 1986-87 revealed that these were based on unrealistic data. The accounts do not give the financial authorities the true account of expenditure incurred and work actually carried out as would be evident from the few instances given below.

(a) Pricing of vouchers: In a majority of cases, the material issue vouchers of naval stores were priced with reference to price list which was compiled about two decades ago and had no relevance to the present day procurement cost for adoption in the production accounts. Although a revision in rates was ordered in April 1985 by Government, no such revision had taken place and vouchers continued to be priced at antiquated rates.

(b) Stores oncost: The labour overhead charges and stores oncost were to be fixed annually with reference to actuals of the previous financial year. While the labour overhead charges were being fixed annually, the stores oncost was being charged at an adhoc rate of five per cent of the materials used which had not been revised since 1964.

(c) Incomplete details of capital assets: The maintenance of records of capital assets (buildings, plants and equipments) by both the dockyard and the CDA-N and an annual comparison of such records and their reconciliation was contemplated in Government orders. The dockyard had not entered the number of buildings completed since 1980 in the Register of buildings on the plea that the Military Engineer Services did not furnish necessary details. Simi-

larly, for want of necessary details of new plant and machinery installed in the dockyard, the Capital Block Register for plant and machinery maintained by the CDA-N was also incomplete. Thus a proper and complete record was not available with either of the authorities. Although the Government had invested over Rs.101.14 crores under the Naval Dockyard Expansion Scheme and National Industrial Development Corporation projects, the capital account exhibited a low figure of Rs.22.94 crores. The Ministry stated in November 1990 that the dockyard was taking steps to obtain the details of the capital assets added for updating the register of building.

22.7.4 Recovery of cost of work done by the dockyard for other agencies/private bodies

Subject to availability of capacity, the dockyard also undertakes work of other departments and private bodies etc. on payment. The non-recovery of charges in the following cases indicated lack of effective financial control and sound procedure.

(a) In June 1980, sanction was accorded to the refit of a ship (other than Navy's) at a cost not exceeding Rs.25 lakhs. The refit was completed by November 1980 at a cost of Rs.58.51 lakhs. The amount was yet to be claimed (November 1990).

(b) The Coast Guard organisation since its formation in August 1978, was dependent on the Navy for maintenance/repairs/refit and logistic support for its ships and the cost thereof was recoverable from them. It was seen that 10 percent surcharge leviable as per orders on works undertaken for other Government departments was not being levied for works and services provided to the Coast Guard organisation by the dockyard. The non recovery for the period 1978-79 to 1988-89 worked out to Rs.1.15 crores.

It was also noticed that there was a short recovery of a sum of Rs.1.06 crores approximately due to difference in rates charged and those chargeable for certain items of stores supplied to the Coast Guard organisation during the period from 1983-84 to 1986-87. The Ministry stated in November 1990 that a procedure would be prescribed to work out the tariff for services rendered to the Coast Guard organisation.

22.8 Plant and machinery

22.8.1 Utilisation of plant and machinery

There was no system of maintaining log/plant record book/machinery cards in the dockyard. In the absence of these documents, it was not possible to ascertain the extent of utilisation of plant and machinery costing Rs.22.62 crores, approximately, procured under the modernisation scheme alone that are held by the dockyard. Ministry stated in December 1989 that maintenance of log book for each individual machine was never followed in any major industry and it was impractical. This argument was not tenable as Ordnance factories and Naval armament depots maintain such records.

22.8.2 Hot dip galvanising plant

The galvanising section alongwith workshop equipment for pipe repair shop was sanctioned in June 1975. An order was placed on an indigenous firm in July 1977 for design, manufacture, supply, erection and commissioning of hot dip galvanising plant on "turnkey" basis at

an estimated cost of Rs.23.18 lakhs. Chemicals worth Rs.10.61 lakhs were also procured during the period from July 1980 to March 1981. The erection of the plant was completed by the end of 1980. During trials in December 1982 the small tank of the plant was damaged which was replaced by the firm in May 1985. The plant was finally commissioned in February 1987.

Though trials carried out in February 1987 were satisfactory, it was found that there was a design deficiency and a large number of additions/alterations were necessary to make the plant operationally viable. The Ministry stated in November 1990 that the plant could not be fully utilised due to inadequate storage space required for housing the chemical stores and articles/fixtures prior to and after the galvanisation. To overcome this difficulty a sanction was accorded for construction of a storage shed by the Naval Command in February 1988 at a cost of Rs.72.86 lakhs, to be completed in 20 months. The work was contracted in December 1988 and was completed in March 1990. Thus the galvanising facility required to be created by the end of 1978 although commissioned in February 1987 could not be made fully operational till March 1990 pending completion of storage shed.

22.9 Uneconomical maintenance of dredging fleet

A quantity of 15.45 lakh cubic metres of silt was required to be removed annually by the dockyard. The dockyard had six dredgers with an annual output of six lakh cubic metres. However, the quantity of silt actually dredged during 1981 and 1988 was between 1.67 and 3.56 lakh cubic metres indicating a shortfall of 41 to 72 percent against the annual dredging capacity. The shortfall was made up by sub contract to Dredging Corporation of India Limited (DCI). Expenditure incurred on dredging by DCI from 1981 to 1988 was Rs.14 crores. The Ministry stated in November 1990 that out of six dredgers, four were more than 25 years old and hence their operational availability was greatly reduced.

Despite the shortfall in the dredging actually done vis-a-vis the capacity of the dockyard dredgers, there had been a gradual increase in the expenditure on refit/repair routine maintenance of dredgers over the years with the result that the cost of dredging by the dockyard fleet as compared to that by the DCI dredgers was substantially higher. While the cost of dredging by DCI increased from Rs.16.41 per cubic metre in 1982 to Rs.29.87 in 1988, the cost of dredging by the dockyard fleet taking into account expenditure on refit, cost of consumable items and fuel increased from Rs.17.96 to Rs.75.29 per cubic metre over the same period which had been attributed by the Ministry to the aged dockyard dredgers. If the pay and allowances of crew/staff, depreciation of craft and cost of shore support are also taken into account, the actual cost of dredging by the dockyard fleet would be much more. Thus, the maintenance of dredgers by the dockyard was cost prohibitive. The Ministry agreed that replacement of the existing dredgers at the earliest was essential but it did not spell out what action had been taken in this regard (November 1990).

22.10 Delay in disposal of decommissioned ships

While the dockyard suffers from berthing constraints for undertaking refits on warships, six decommissioned ships were allowed to occupy valuable berth-

ing place for periods ranging from one to three and a half years due to delay in their disposal. One ship decommissioned in December 1986 was yet to be disposed off (November 1990). The Ministry stated in November 1990 that cumbersome procedures made it difficult to effect quick disposal and added that efforts were in hand to dispose of the ships at the earliest.

23. Naval Hydrographic Department

23.1 Introduction

The Naval Hydrographic Department (Department) is the national authority for undertaking hydrographic surveys of the Indian coasts and harbours and production of nautical charts and documents required for navigational and other purposes. In its advisory capacity, the Department is responsible for tendering advice to the Government of India on matters relating to hydrography and Defence oceanography, maritime boundaries and the law of the sea. The Department is also responsible for coordinating the national hydrographic activities in consultation with the Hydrographic Survey Committee of the National Harbour Board (NHB) in the Ministry of Surface Transport.

23.2 Scope of Audit

A review of the Department was carried out covering interalia, the acquisition of survey vessels, hydrographic plans and their implementation, budgetary control, utilisation of assets and their upkeep and the functioning of the organisation with reference to the assigned tasks.

23.3 Organisational set up

The Department, headed by the Chief Hydrographer to the Government of India, is one of the directorates of Naval Headquarters (HQ). The Department consists mainly of a Naval Hydrographic Office, survey ships and craft.

23.4 Highlights

- **The present system of budgetary control was not considered adequate as it had led to inadequate growth resulting in ineffective control on the project and activities.**
- **There was serious time overrun extending up to 77 months and cost overrun aggregating to Rs.15 crores in the construction of three survey ships and four survey craft inducted in the Department during the first half of the eighties. Despite this, liquidated damages amounting to Rs.79.22 lakhs recoverable as per contract were not recovered from Garden Reach Ship Builders and Engineers (GRSE).**
- **There was a steep increase in cost of construction of identical survey ships from Rs.14 crores for the ship delivered in August 1985 to Rs.45.33 crores for the ship delivered in January 1990 by GRSE.**
- **Four survey craft acquired at a cost of Rs.16.03 crores, had inherent problems and they could not serve as stable platforms for surveys in sea state two and above. The hull of one of the craft turned out to be so poor that it required extensive renewal/repair at a cost of Rs.2 lakhs in five years of its commissioning.**
- **Serious backlog continued to exist in surveys.**
- **Due to the failure to complete repair/maintenance of vessels during non-survey seasons, there was heavy loss of survey days. Even**

after incurring an expenditure of Rs.5.54 crores for the repair of an ageing ship, the ship was not available for survey duties for 870 out of 1589 survey days available during 1983-88. Expenditure of Rs.43.65 lakhs incurred for the import of crankshaft fitting in the ship remained largely infructuous.

23.5 Budget and finance

The expenditure in respect of the Department is met from the budgetary allocation for the Defence Services and budgetary control is exercised by Naval HQ. The present system of budgetary control was not considered adequate by the Department as it had led to inadequate growth resulting in ineffective control on the projects and activities. Considering the dichotomy of responsibilities of the Department towards the Ministry of Defence as well as to the Ministry of Surface Transport and due to the inability of the Ministry of Defence to meet the entire financial requirements of the Department, an action plan was drawn up by the Ministry of Surface Transport in May 1984 and it was recommended that there should be a separate budget for the Department under the Ministry of Surface Transport while the administrative control could continue to remain with the Ministry of Defence. However, the recommendations were yet to be approved by the Government. The Ministry stated in October 1990 that the matter was under consideration of the Government.

23.6 Capital outlay

23.6.1 General

The essential ingredients for the efficient functioning of the Department include survey ships (for offshore surveys), survey craft (for harbour and coastal surveys) and surveying equipment. A study of the acquisition of survey vessels and craft revealed certain deficiencies and weaknesses which are discussed below:

23.6.2 Survey ship

The Department had four survey ships, of which three were due for replacement in the seventies. Construction of one survey ship at an estimated cost of Rs.4.5 crores and two survey ships at an estimated cost of Rs.22.80 crores was, therefore, sanctioned by the Ministry in December 1971 and August 1975 respectively. These survey ships were constructed and delivered by GRSE in February 1981, October 1983 and August 1985 respectively. However, the old ships had to be decommissioned in September 1974, December 1978 and December 1980 without waiting for the replacements due to their poor material state. The actual construction cost against the initial estimate and delay in delivery were as under:-

Ship	Date of Govt Sanction	Cost as per contract (Rs. in crores)	Acual cost	Scheduled date of delivery	Actual date of delivery	Overrun	
						Cost (Rs.in crores)	Time (in months)
Ist	Dec 1971	7.16	12.28	Dec 1976	Feb 1981	5.12	50
2nd	Aug 1975	10.92	28.00	Oct 1978	Oct 1983	5.85	60
3rd		11.23		Mar 1979	Aug 1985		77

The delay was on account of the failure of GRSE to adhere to the drawing schedule and the delay in ordering long lead items. Since it was the first survey ship constructed by GRSE, only a token amount of Rs.10.32 lakhs was recovered as liquidated damages for the first survey ship against Rs.51.60 lakhs recoverable as per contract. In the case of second and third survey ships, liquidated damages recovered were Rs.26.35 lakhs and Rs.26.46 lakhs against Rs.65.87 lakhs and Rs.66.16 lakhs respectively recoverable as per contract. Thus, apart from accepting delay with consequential cost overrun, the Ministry also limited the amount of liquidated damages that could have been recovered from the PSU under the terms of the contract. The Ministry stated in October 1990 that it had been decided to limit the liquidated damages to two per cent on the revised price as the yard in question was a defence undertaking.

23.6.3 Additional survey ships

The Ministry, sanctioned between February and November 1985 the construction of three additional survey ships at a total cost of Rs.65 crores. Agreement for construction and delivery of one of these survey ships was concluded with GRSE in June 1986. The agreed cost of the vessel was Rs.22 crores and it was to be delivered by July 1988. However, the vessel was delivered in January 1990 and the cost of construction rose to Rs.45.33 crores.

Agreement for the construction of the remaining two survey ships was entered into with GRSE in January 1988 at a cost of Rs.68.90 crores against the originally sanctioned cost of Rs.45 crores. The ships which were to be delivered by December 1989 and October 1990 are expected to be delivered by March and December 1991 respectively.

Thus the cost of identical survey vessels constructed by GRSE escalated steeply from Rs.14 crores for the ship delivered in August 1985 to Rs.45.33 crores for the ship delivered in January 1990. The Ministry stated in October 1988 that the finalisation of the contracts for construction of two survey ships sanctioned in November 1985 was delayed on account of prolonged negotiations with GRSE as there was considerable increase in prices quoted by them.

The Ministry while admitting in October 1990 that in the negotiations, competition factor was absent, stated that the disadvantage on that account was compensated to some extent in a series production of a particular type of ship by the same shipyard. The fact, however, was that the first indigenous survey ship 'A' had been built in 1964 by Hindustan Shipyard Limited (HSL) and not by GRSE.

23.6.4 Survey craft

In May 1978, the Ministry sanctioned the construction of four survey craft at a cost of Rs.12 crores which were to be delivered between August 1981 and August 1982 as per contract concluded in December 1980. The survey craft were actually delivered by Goa Shipyard Limited (GSL), between January and October 1984 at a cost of Rs.16.03 crores. The cost overrun was Rs.4.03 crores while the time overrun varied between 19 and 34 months.

Experience gained during the operation of these craft revealed that the platform was not stable and due to excessive rolling and pitching, these

vessels were unable to collect high quality data in sea state two and above. Even normal chart room functions were difficult during moderate sea conditions. Moreover, the ideal craft for undertaking surveys within coastal/inshore waters should have a draught of 1.5 to 1.8 metres. However, the survey craft, although had a full draught of 1.8 metres, has a propeller draught of 2.45 metres which is more than the desired draught. Lastly, the survey craft were not provided with survey motor boat which is a vital requirement for carrying out surveys.

The above limitations imposed serious operational handicap on the Department to perform the assigned task. To improve the sea keeping qualities of the craft, bilge keels were provided during the guarantee repairs at GSL at an additional cost of Rs.2 lakhs. Despite the provision of bilge keel, the stability problems persisted during sea state two and above. Therefore, the utilisation of the survey craft was problematic and contributed to the reduced ability of the Department to attend to its assigned task. The Ministry stated in October 1990 that by posting experienced surveyors to the craft, the limitations could be overcome to a great extent.

Even though the contract with GSL envisaged that the survey craft would be built with the best materials and the Naval overseers would have the right to reject any material on point of quality, the hull condition of the survey craft 'H' commissioned in October 1984 turned out to be extremely poor necessitating the renewal of hull plating at a cost of Rs.2 lakhs during dry docking in 1989. The Naval authorities stated that they could not assess the reasons for the poor hull condition of the craft. The Ministry stated in October 1990 that the detailed analysis of poor hull state involves extensive destructive and non-destructive testing, which could not be carried out.

23.7 Activities of survey ships and craft

Hydrographic field surveying works are carried out by survey ships and craft for about 225 days in a year from the beginning of October every year to mid May next year. Before commencement of the survey season, a sub committee of the Hydrographic Survey Committee allots survey tasks depending upon the availability of survey vessels and their capabilities. The review of the allotted tasks and achievements during the years 1984-85 to 1988-89 indicated shortfalls in surveys ranging from 25 to 58 per cent.

These shortfalls were attributed to ships remaining under routine refits/repairs during survey season, confidential survey work undertaken to meet urgent deployment of ships for search and rescue operations and urgent defence operations/surveys, etc.

The routine refit and maintenance of survey vessels are required to be carried out during non-survey seasons, i.e. from mid May to September so that the vessels would be available for full time operation during survey season. On an examination in audit, it was observed that considerable survey days were lost as the ships were undergoing their scheduled repairs and refits during the survey seasons. The Department indicated in October 1989 that the repairs extended to survey seasons mainly on account of non-availability of spares. However, the non-availability of spares is indicative of failure of timely procurement of spares.

The Ministry stated in October 1990 that apart from non-availability of

spares, the non-availability of docks and ancillary facilities were also contributory factors. The Department had therefore, been offloading refit to commercial yard from 1989 onwards for ensuring timely completion of repairs during the non-survey seasons.

Ship 'A' built by HSL was commissioned into the Navy in 1964. Considering an approved life of 20 years, the ship would have fallen due for decommissioning in 1984. The ship was retained in service till January 1990 and the expenditure incurred for her repair from 1983-84 to 1987-88 was Rs.5.54 crores. Even so, the ship was not available for survey duties for 870 out of the 1589 survey days available during this period. The retention of the ship in service beyond 1984 turned out to be cost prohibitive.

23.8 Naval Hydrographic school

In order to provide training to personnel according to internationally accepted standards of competence, modern hydrographic training facilities were created in the Naval Hydrographic School with assistance amounting to Rs.2.6 crores from United Nations Development Programme. The Indian input for the project was estimated at Rs.1.55 crores of which facilities costing Rs.82 lakhs were already existing. Of the remaining Indian input, Rs.50.11 lakhs was for Automatic Data Logging System (ADLS) and Rs.22.47 lakhs for personnel, transport etc. The project commenced in September 1980 and scheduled for completion by September 1982 was extended to December 1984. Most of the equipment sanctioned were installed by January 1984. However, ADLS was yet to be installed. Due to the nonavailability of ADLS, training in operations and usage of such a system could not be conducted and to that extent the training commitments of the school were affected.

23.9 Procurement of crank shaft

Based on an indent raised in September 1985, a crank shaft was procured from a foreign firm against a contract concluded by Naval HQ in January 1986 at a cost of Rs.43.65 lakhs. On receipt of the crank shaft in June 1987, it was fitted in one of the engines of survey ship 'A'. The crankshaft was accepted from the firm without testing, considering the reputation of the firm. After about 158 hours of engine running, the crank shaft developed deep straight line cracks. The defects in the crank shaft were not rectified and the engine remained non-operational till the ship was decommissioned in January 1990. Thus, expenditure for the procurement of equipment costing Rs.43.65 lakhs remained largely infructuous.

The Ministry stated in October 1990 that the item was accepted under warranty and was inspected in India after receipt. However, the inspection was limited to visual examination and no non-destructive testing was done despite the availability of facilities for such testing in Naval Dockyard, Bombay. The acceptance of substandard items without proper testing merits investigation.

WORKS SERVICES

24. Construction of an auditorium at Karanja

The Western Naval Command (WNC) sanctioned in February 1979 the construction of an auditorium at Karanja which was beyond its competence as the sanction of the Government was a prerequisite in this instant

case. Additionally, provision of a balcony in the auditorium was also irregular as it exceeded the scales laid down. The details of the case are as follows.

In August 1978, Western Naval Command constituted a Board of Officers (Board) for recommending and siting a swimming pool and auditorium cum lecture hall (auditorium) at Karanja as per authorisation. That Board recommended construction of a swimming pool and auditorium having a seating capacity of 450, in September 1978.

Based on the recommendations of the Board, the WNC accorded sanction in February 1979 at an estimated cost of Rs.28.51 lakhs. In February 1980, construction of the swimming pool was deleted from the sanction and the estimated cost of the auditorium was revised to Rs.20.46 lakhs. In July 1980, the sanction was further amended increasing the seating capacity from 450 to 550 numbers. The sanction included provision for a balcony costing Rs.7.82 lakhs approximately which was authorised for auditoriums having a seating capacity of 900 to 1200 seats as per scales authorised by the Government in August 1983. The estimated cost also underwent an upward revision from Rs.20.46 lakhs to Rs.23.31 lakhs.

As the sanctioned strength at Karanja was less than the specified number, the provision of an auditorium was not authorised for the station. Under the extant orders, it could be considered on merits and sanctioned only as a 'special item' of work. A contract was however, concluded in November 1982 by the Chief Engineer (CE) for the construction of the auditorium at a cost of Rs.43.82 lakhs. The work was commenced in November 1982 and was completed in September 1986 at a cost of Rs.53.27 lakhs. The auditorium was taken over by the users in February 1987. Revised sanction of the competent authority was, however, yet to be issued (October 1990).

The Ministry stated in October 1990 that as per extant orders applicable in 1979, sanction was accorded by the WNC for the construction of the auditorium with a seating capacity of 550 based on merits of the case and it was not treated as a 'special item'. As far as the provision of balcony was concerned, the Ministry stated that the provision of scales promulgated in August 1983 had been taken into account, though these were not operative during 1979 when the work was sanctioned. The Ministry's reply was not tenable as in the absence of prescribed scale for personnel strength of less than the specified number at a station, the works, even if considered on merits, would require to be treated as 'special work' and it was beyond the competence of WNC to sanction such works.

25. Non-utilisation of accommodation at Visakhapatnam

Living accommodation built at a cost of Rs.9.47 lakhs remained unallotted from May 1986 in a Naval project at Visakhapatnam. Administrative approval was issued by Headquarters Eastern Naval command for the construction of six type 'A' quarters and eight type 'B' quarters at an estimated cost of Rs.9.35 lakhs. Contract for the construction of the 14 quarters was concluded with a firm in April 1983 at a cost of Rs.9.97 lakhs to be completed in May 1984. The construction was completed in May 1986 at a cost of Rs.9.47 lakhs and taken over by Military Engineer Services in June 1986.

For the provision of external electrification and water supply for these quarters, another contract was concluded with another firm in April 1984 for Rs.0.53 lakh, to be completed in August 1984 subsequently revised to December 1984. This work had not been completed (September 1990). Meanwhile, in 1984, a sum of Rs.0.43 lakh was paid to the contractor for the portion of work done by him under the contract. The Ministry stated in September 1990 that attempts were made to persuade the contractor to complete the work by December 1989 by granting extension of time. However, on realisation that the contractor had no intention to complete the work, the contract was terminated in January 1990 at the risk and cost of the contractor. Contract for execution of the balance work was still to be concluded.

The quarters constructed in May 1986 had not been allotted. This resulted not only in avoidable payment of house rent allowance to the key personnel to the extent of Rs.1.53 lakhs between June 1986 and October 1990 but also nonrealisation of licence fee to the tune of Rs.0.43 lakh. The Ministry stated in September 1990 that the allotment of accommodation was unavoidably held up due to deficiency of the industrial staff/key personnel and non-utilisation of transmitting facilities by the Navy.

The case revealed improper planning resulting in non-utilisation of quarters constructed at a cost of Rs.9.47 lakhs for over four years.

PROVISIONING

26. Avoidable import of airborne communication equipment

A proposal by the Navy to import eight sets of airborne communication sets in April 1985 was approved by Government in November 1986. The sets were imported in November 1987 at a cost of Rs.25.72 lakhs and were merged into maintenance stock. Although the reasons for import were stated to be delay in manufacture by a public sector undertaking (PSU), it was observed that during this period PSU had supplied 25 sets to the Indian Navy. The import was, therefore avoidable. The details of the case were as under:

The Ministry of Defence (Ministry) sanctioned in June 1980, the procurement of 130 sets of airborne communication sets, 12 sets of test equipment and associated spares etc. from a PSU at an estimated cost of Rs.440.40 lakhs. These sets were required between 1983 and 1988 for replacing the communication sets already in use which would have by that time completed their assessed operational life.

The flight trials of the set developed by the PSU were carried out by the Navy in 1983 and it was found to be incompatible with the Navy's ground and shipborne commmunication sets. The PSU, therefore, carried out modifications which were completed in 1985. After successful completion of trials by the Navy in 1986, the PSU supplied 66 sets between 1986 and September 1990, out of which 39 sets were installed in various Naval aircraft/ helicopters (September 1990).

Meanwhile the Naval Headquarters (HQ) put up a proposal in August 1983, for the immediate replacement of the aged and unreliable airborne communication sets on 12 SeaKing helicopters by import as the indigenous sets were not likely to be available to the Navy in the desired state during the next few years. In view of emergent require-

ments, the Ministry decided that the Navy could go ahead with the fitment of imported airborne communication sets in six helicopters out of their existing resources. Six helicopters were modified by the Navy in January/February 1984 by utilising the imported communication sets from 2nd/3rd line maintenance stock of other aircraft/ helicopters. The remaining six helicopters were also modified in April 1985 by utilising the sets from reserve stock. However, the communication sets installed in these 12 helicopters were without the homing equipment which are essential for operating aircraft from ships.

In April 1985, in view of the delay in delivery of the communication equipment by the PSU, the Naval HQ reviewed their earlier proposal for the import of a reduced quantity of eight sets of airborne communication sets and 14 sets of homing equipment not available in the existing system. This was sanctioned by the Ministry in November 1986 for Rs.37.50 lakhs with a foreign exchange (FE) component of Rs.35.72 lakhs. The Naval HQ, in February 1987 placed an indent on the Supply Wing of an Indian Mission abroad (SW) for the procurement of the airborne communication sets. This, however, did not include an indent for homing equipment due to escalation in cost. The SW concluded two contracts in May 1987 with two firms at a cost of Rs.25.72 lakhs for the supply of the communication sets. These sets were received in November 1987 and were merged into the maintenance stock.

The Naval HQ requested the Ministry in February 1987 for the release of additional FE of Rs.18.48 lakhs for the purchase of homing equipment. This was not agreed to by the Department of Electronics which suggested the procurment of the same from the PSU. The Ministry's sanction was, therefore, revised in December 1988 for the procurement of 14 sets of homing equipment from the PSU at an estimated cost of Rs.27.55 lakhs. The homing equipment as well as the interface unit though developed by the PSU were to be proven in flight trials. The Ministry stated in September 1990 that on successful completion of flight trials, the modkit would be productionised and thereafter the helicopters would be modified. The Ministry added that this was expected to be completed by end 1991.

27. Avoidable expenditure in procurement of welding equipment

A Board of officers was constituted in December 1980 to assess the serviceability of welding equipment held in a Naval Dockyard. Sixteen of these welding equipment imported in 1977, were declared as beyond economical repairs (BER) in May 1981. In August 1982 Naval Dockyard sought financial sanction for replacement of the equipment by indigenous welding equipment manufactured by firm 'A'. The firm had quoted Rs.30,100 for each main equipment in August 1982 and again in April 1983. Meanwhile, during May and August 1982, another Board declared 12 more welding equipment as BER which were also recommended to be procured from firm 'A'. The Naval HQ accorded four sanctions in August and September 1983 for the procurement of 28 welding equipment alongwith spares including some other machines declared BER by the Board at an estimated cost of Rs.17.6 lakhs. This estimated cost was worked out by adding 20 percent escalation to the price quoted. Out of Rs.17.6 lakhs, the estimated cost of 28 welding equipment was approximately Rs.13.28 lakhs.

The Naval HQ placed four indents on Director General of Supplies and Disposals (DGSD) between October 1983 and February 1984 for procurement of 28 welding equipment from firm 'A' in whose favour Proprietary Article Certificate (PAC) was also issued. However, in October 1983 the DGSD returned an indent to the Naval HQ stating that technical reasons for according PAC were not given and similar equipment was available on rate contracts at much cheaper rates.

The equipment available on the rate contracts was not considered suitable by the consignee. The Naval HQ requested DGSD in August 1984 to procure these equipment on open tender basis. It raised two fresh indents in November 1984 and April 1985 for the procurement of 28 welding equipment alongwith accessories and spares at an estimated cost of Rs.17.6 lakhs.

The DGSD after calling quotations and getting them examined by Naval HQ asked for a copy of military specifications which the Naval HQ could not provide and therefore, DGSD was requested to procure the equipment as per the Indian standard (IS) specifications. The DGSD cancelled the indent and a fresh indent was raised by Naval HQ in August 1986 with IS specifications and the DGSD again sent the rate contracts which were found unsuitable.

Finally, the DGSD concluded a contract in September 1987 with firm 'B' for supply of 28 welding equipment alongwith spares and accessories at Rs.17.54 lakhs. As per the contract, the cost of main equipment was Rs.50,350 each as against the cost of Rs.30,100 quoted by firm 'A' in 1982 and 1983. The equipment were received in May 1989. Till August 1989, 15 equipment became defective and the firm was requested to rectify the defects, under warranty. Ministry stated in October 1990 that at present 20 equipment were operational and action was in hand to rectify defects in the balance eight valuing Rs.4.75 lakhs which were unserviceable.

The case revealed that uncertainty on the part of Naval HQ regarding the specifications of the welding equipment led to inordinate delay in its procurement resulting in avoidable expenditure of Rs.5.67 lakhs. Eight equipment costing Rs.4.75 lakhs were still lying in unserviceable condition (October 1990).

28. Delay in procurement of an equipment

A Defence Research and Development Laboratory (Lab) obtained in July 1981, a quotation from a foreign proprietary firm for acquisition of a pilot vacuum filling equipment which was stated to be for project 'A' as well as for the build up programme of the Lab. Though the quotation was valid upto December 1982, it was only in August 1983 that the Lab sought the sanction of the Defence Research and Development Organisation (DRDO) for release of foreign exchange (FE) to the extent of Rs. 18 lakhs for purchase of the equipment. The total cost of the acquisition was Rs.19.80 lakhs out of which Rs.16.73 lakhs was the f.o.b. cost of the equipment. Sanction was accorded by the DRDO in January 1984. Since the period of validity had expired, fresh quotations had to be called for from the firm and in May 1984, the Lab approached DRDO for release of additional FE of Rs.12 lakhs, based on the fresh quotation. The increase was on account of Rs.9 lakhs for erection, commissioning of equipment and training of personnel by the firm which according to the Lab,

had not been initially visualised and Rs.3 lakhs due to increase in the cost of equipment. In fact, the Lab could have obtained the quotation for erection, commissioning and training alongwith the cost of equipment since a mention about this had been made by the firm in 1981 itself. In November 1984, the Project Board to which the case was referred by DRDO at that stage, considered that the equipment was not required for project 'A'. On this, the Lab authorities revised their stand and explained to DRDO in January 1985 that the procurement of the equipment was projected under the build up programme only and its requirement in project 'A' was also mentioned so as to expedite its procurement. The Lab was directed by DRDO in April 1985 to put up fresh proposal.

Accordingly, the Lab again projected a case in April 1985 for release of FE to the extent of Rs.30 lakhs which was sanctioned in June 1985. The Lab raised an indent on Director General of Supplies and Disposals (DGSD) in August 1985 for procurement of equipment. Tender enquiry was floated by DGSD and based on the rates quoted by the firm in November 1985 the DGSD asked for further additional FE for Rs.12 lakhs which was released by DRDO in July 1986. The contract was concluded by DGSD with the firm in September 1986 at a total cost of Rs.49.64 lakhs which included the cost of equipment, (Rs.42.58 lakhs) plus the cost of spares and commissioning. The supply was to be completed within 12 months of opening of letter of credit (LC). Since the firm could furnish the bank guarantee only on 15th March 1987, the LC was established in April 1987 and the consignment received by the Lab in July 1988. Ministry stated in November 1990 that the reasons for the delay and recovery of liquidated damages, if any, from the firm on this account were awaited from DGSD. In the meantime, the exchange rate of DM had gone up substantially from Rs.4.06 to Rs.7.12 per DM which contributed to the steep escalation in costs.

As the erection charges quoted by the firm were considered very high, the Lab concluded a separate contract for erection with an Indian firm in April 1989 at a negotiated cost of Rs.5.88 lakhs. The equipment was commissioned in March 1990 by which time the warranty period had expired. Throughout this period, the Lab was managing its programme at a small scale by make shift arrangements.

The case revealed that :

- delay in the procurement of equipment resulted in an avoidable extra expenditure of Rs.25.85 lakhs (Rs.13.24 lakhs escalation plus Rs.12.61 lakhs exchange rate variation) in the procurement of equipment besides increase in cost of spares, transportation and commissioning.

- in the absence of the equipment, Lab had to programme their work at a small scale by makeshift arrangements.

Ministry stated in November 1990 that the delay, to a great extent, was due to procedural formalities. However, it did not indicate the measures being taken to avoid such delays in the future.

29. Extra expenditure in the provisioning of base and depot spares

In December 1980, Government sanction was accorded for the procure-

ment of base and depot (B&D) spares for a ship at an estimated cost of Rs.4.55 crores, including Rs.2 crores in foreign exchange (FE). Naval Headquarters (HQ) raised a demand in November 1982 for the procurement of 128 items of B & D spares of an equipment of the ship on the basis of an offer made by the foreign proprietary firm which had quoted Rs.41.03 lakhs for 82 items of the spares in September 1982. Thereafter, the matter remained under discussion among the different directorates of Naval HQ till January 1984 when the Ministry of Defence (Ministry) was approached for release of FE of Rs.47.18 lakhs after adding 15 percent escalation to the quotation of September 1982. The Ministry released the FE in March 1984.

The Naval HQ raised an indent in June 1984 on the Supply Wing (SW) of an Indian mission abroad for the procurement of all the 128 items of B & D spares. In response to the tender inquiry, fresh quotation of the firm, valid upto February 1985, was received for Rs.59.62 lakhs for 127 items, including Rs.4.63 lakhs in respect of 45 items for which the firm had not quoted in September 1982. As the rates obtained exceeded the sanctioned cost, the SW asked Naval HQ for additional funds of Rs.12.44 lakhs. In order to avoid delay in getting the release of additional FE, Naval HQ deleted four items costing Rs.9.63 lakhs (as per the quotation of September 1982) from the indent and decided to procure these subsequently after getting sanction to the release of additional foreign exchange.

In March 1985, the SW concluded a contract with the firm for supply of 123 items of B & D spares at a cost of Rs.44.77 lakhs. The cost of common items was Rs.40.14 lakhs against Rs.31.39 lakhs quoted by the firm in September 1982. The supply was completed in July/ August 1986. Though there was provision in the contract to place order for the deleted items within 90 days, no action had been taken for their procurement till October 1990. Ministry stated in October 1990 that the procedural delay at various levels which could not be eliminated altogether had resulted in the extra expenditure.

The case revealed that inordinate delay on the part of Naval HQ in processing the case had resulted in an extra expenditure of Rs.8.07 lakhs due to escalation in prices and Rs.0.68 lakh due to escalation in exchange rate on the procurement of spares.

30. Injudicious procurement of communication sets

The Navy had been purchasing a large number of communication equipment for naval ships and communication centres from various public sector undertakings (PSU). Some instances of unnecessary procurement of communication equipment as also avoidable payment of escalation charges due to the delay in placement of orders are mentioned below.

Case-I

Naval Headquarters (HQ) proposed in August 1987 the procurement of 25 communication sets 'A' for naval ships and establishments stating that by the time the sets were received in 1989-90, the old sets in those ships/establishments would have outlived their useful electronic life of 12.5 years and fallen due for replacement. The cost of the sets inclusive of accessories, spares etc., was estimated at Rs.288.77 lakhs, based on a quotation received from Bharat Elec-

tronics Limited (BEL). In October 1987, the Ministry of Defence (Ministry) approved the proposal. Eighteen sets valued at Rs.201.50 lakhs were received from BEL upto May 1990.

Audit pointed out to the Ministry in March 1988, that of the 25 old sets stated to be due for replacement in 1989-90, replacement of nine sets would be due between February 1997 and July 1998 as these had actually been received between August 1984 and January 1986. In reply, Naval HQ stated in May 1988 that it was not possible to take procurement action for replacement based on the receipt of the sets and replacement planning was done on the basis of date of the sanction. The contention of Naval HQ was not tenable as in the instant case, the nine sets although sanctioned in September 1975, were actually received between August 1984 and January 1986. Evidently there were no prospects of the utilisation of nine sets costing Rs.100.75 lakhs for another seven to eight years.

The Ministry stated in September 1990 that it would be impracticable as well as humanly impossible to obtain replacement as per the date of delivery and it might also lead to complexities in accounting. The contention of the Ministry was surprising as all equipment are centrally received in Naval Stores Depots which intimate receipt of stores etc. to Naval HQ. It should, therefore, pose no problem for Naval HQ to draw up a replacement schedule based on the dates of receipt.

Case-2

Based on a proposal made in June 1987 by Naval HQ for procurement of 81 communication sets 'B' from Hindustan Aeronautics Limited (HAL), the Ministry sanctioned in April 1988 the procurement of the sets alongwith complete accessories, spares etc. at Rs.8.02 crores. The sets were required for replacing old sets in ships and establishments. Audit noticed that the ships for which the sets were being procured included a few ships which were due for decommissioning before the receipt of the sets in 1992-93. Naval HQ stated in December 1988 that the sets being procured for such ships would be placed in reserve stock. As sufficient reserve stock had already been catered for, the sets falling surplus on account of the decommissioning of ships would be in excess of authorised requirements. Since two ships had already been decommissioned (June 1990) and a certain number of ships were due for decommissioning by 1992-93, the procurement of 12 sets costing Rs.122 lakhs was unnecessary and avoidable. The Ministry stated in September 1990 that at the time of planning replacement, the balance life of ships had been taken into consideration but due to subsequent planning/review of force levels, those ships were decommissioned. This statement of the Ministry was at variance with what had been stated by Naval HQ to Audit in April 1989 that the directorate which proposed the procurement of the sets was not aware of the dates of decommissioning of ships.

Case-3

In March 1985, Naval HQ proposed the procurement of 20 communication sets 'D' from Electronic Corporation of India Limited (ECIL). In October 1985, a price negotiation committee (PNC) held negotiations with ECIL and in the meeting the unit rate was fixed at Rs.3.40 lakhs, valid for delivery till March 1987 and, thereafter, the rate was to be escalated at the rate of ten per cent per annum. The agreed delivery

schedule during the meeting was four in 1987, six in 1988 and five each during 1989 and 1990. The Ministry sanctioned in March 1986, the procurement of 20 sets with spares at an estimated cost of Rs.163 lakhs. Naval HQ placed the supply order on ECIL in April 1986. In May 1986 ECIL stated that the delay of six months in placing the order would shift the delivery schedule by six months and consequently the rates would escalate by ten per cent. The Ministry had to sanction in May 1987 an additional amount of Rs.15 lakhs to cater for the increase in cost on this account.

Apart from the increase in cost on account of delay in placing order, the supply order value was inflated by Rs.1.52 lakhs as the escalation was applied erroneously at compounded rate against the simple rate of ten per cent agreed to during negotiations. When Audit pointed out this error in February 1988, Naval HQ issued amendments in July 1988 and August 1990 to rectify the error, resulting in a saving of Rs.1.52 lakhs.

To sum up,

- procurement of set 'A' costing Rs.100.75 lakhs was premature;

- the practice of planning procurement of replacements taking into account the date of sanction as criterion was unsound;

- procurement of set 'B' costing Rs.122 lakhs was unnecessary and avoidable; and

- the delay in placing supply orders for the procurement of set 'D' had resulted in an avoidable extra expenditure of Rs.15 lakhs.

There was, therefore, a need to review the existing procedure in the procurement of communication sets to streamline it so as to avoid premature or unnecessary procurement and avoidable escalation due to the delay in placement of orders.

31. Purchase of defective test equipment

An order for supply of a test equipment was placed on a foreign firm in February 1983 at a cost of Rs.3.87 lakhs. This equipment was required for testing the printed circuit boards (PCBs) of a navigational system fitted on a type of aircraft. The equipment was received in a store depot in May 1984, and was issued in November 1984 to a Naval Air Yard at the same station. As no instructional manual was made available by the firm alongwith the equipment, it could not be put to use. The Ministry stated (October 1990) that the order placed on the firm did not specifically mention supply of an instructional manual.

In February 1985, the Naval Air Yard approached the firm to provide the instructional manual. The firm stated in March 1985, that these manuals were for information only and for future use after the naval personnel were trained on the use of the equipment and cautioned against handling of the equipment by untrained staff as that would damage the equipment. The Ministry stated (October 1990) that the firm had not specified the requirement of training of personnel on the test equipment at the contracting stage and the training package offered was not accepted keeping in view the experience of naval personnel in handling these types of test equipment.

The firm delivered the instructional manuals in September 1985. In November 1985, On checking out the equipment with the aid of the technical publications, certain subunits/components of the test equipment were found defective and the firm was requested to replace them under the warranty. In January 1986, the firm advised that the defective equipment should be returned to them for repair. Accordingly, the equipment was returned in February 1986. In May 1987, the firm returned the equipment without repair on the plea that the equipment failure date was outside the warranty validity of one year and that the items were tampered with by unauthorised personnel and received in damaged condition.

The defective equipment was received back in November 1987 and was handed over to the Naval Air Yard in October 1988. The Naval Store Depot in July 1989 and again in April 1990 approached Naval HQrs for the procurement of spares for carrying out certain repairs. Those are yet to be procured (October 1990). Meanwhile, five repairable PCBs, received between July 1987 and January 1989, were awaiting repairs for want of serviceable test equipment.

The case revealed that an equipment procured at a cost of Rs.3.87 lakhs was unserviceable and has remained unutilised for over six years as a result of which five PCBs were awaiting repairs for over two years.

32. Extra expenditure due to delay in execution of contract

Naval Headquarters mooted a proposal in April 1984 to enter into a contract with a foreign consultant to build up competence and expertise to undertake a specific design study for ongoing shipbuilding/ modernisation programme. The Defence advisers abroad were asked to identify the firms which were capable and willing to offer consultancy in this specialised field. Out of a total of ten proposals received between 1982 and 1986, Naval Headquarters shortlisted four firms based on their evaluation. Technical and price negotiations were held with three firms in April/May 1986 as one did not respond to request for negotiation.

The offer of firm 'A' ($ 10,30,500 = Rs.132.28 lakhs) which was the lowest and also technically acceptable, was approved by the Ministry of Defence (Ministry) in January 1987.

Firm 'A', however, increased the consultancy cost to $ 10,96,500 in January 1987 but later agreed to extend the validity of original offer upto March 1987. As the contract was not signed by that time, the firm agreed to keep the enhanced price valid upto 15th May 1987 with a stipulation that a price reduction of $ 1500 would be allowed for each day prior to 15th May 1987 on signing the contract. The contract was finally awarded to firm 'A' in July 1987 at an increased cost of $ 10,75,615 (Rs.138.08 lakhs) after deputing a team of Naval officers abroad in April 1987.

The inordinate delay in execution of the contract within the validity period of March 1987 resulted in an extra expenditure of $ 45,115 (Rs.5.80 lakhs).

The Ministry stated in February 1990 that the reasons for delay were purely procedural as the terms and conditions of the contract were to be sorted out over correspondence initially.

33. Provisioning of composite communication system

A composite communication system (system) was fitted on a certain class of naval ships from 1983 onwards. Naval Headquarters (HQ) felt the necessity for the provision of the system to two training schools to impart training to maintenance and operation personnel as well as of a system to Naval Dockyard, Bombay to create the base maintenance support. Based on a budgetary quotation obtained in June 1983 from a public sector undertaking (PSU), Naval HQ sought, in August 1983, sanction of the Government for the provision of three sets of the system at Rs.206.84 lakhs. The Ministry of Defence (Ministry) in November 1983 while agreeing to the provision of the system for the two training schools, for Rs.133.81 lakhs, marked the matter regarding the system for dockyard for discussion with the PSU to explore the possibility whether test jigs or other suitable alternative for repairs would suffice instead of the complete system. Naval HQ desired in December 1983 that the complement of the system proposed for the dockyard be sanctioned early so as to avoid adverse bearing on the upkeep of the system already fitted on a ship. In August 1984, Naval HQ again recommended that a skeleton system must be held with the dockyard so that defective units, after repairs, could be tested prior to return to the ships. The Ministry, however, reiterated in September 1984 that jigs/ test equipment should suffice to meet the requirement of the dockyard and asked Naval HQ to decide in consultation with the PSU.

In October 1986, Naval HQ, after consultation with the PSU, sought Government sanction for the system and the test jigs for the Dockyard, for Rs.90 lakhs. In this proposal, 25 items comprising the system had increased in cost by Rs.6.17 lakhs as the validity of the PSU's offer of June 1983 had expired in March 1984 and the proposal was based on the PSU's revised offer of February 1987. The jigs and fixtures had increased in cost from Rs.22.67 lakhs based on the PSU's offer of October 1985 to Rs.24.12 lakhs based on the PSU's offer of January 1987 resulting in an increase of Rs.1.45 lakhs. On further consideration, Naval HQ revised their proposal in March 1987 for Rs.56.40 lakhs by meeting certain items of the system costing Rs.13 lakhs from stock and deleting certain items.

Government sanctioned the procurement of the system alongwith test/ repair facilities for the dockyard at Rs.56.40 lakhs in June 1987. A supply order was placed in July 1987 by Naval HQ on the PSU for Rs.51.28 lakhs after slightly modifying the requirement. Though the delivery schedule was for July 1989, the equipment was not supplied till September 1990.

The case revealed that inordinate delay in finalising the requirement of the system and the test jigs for the dockyard had resulted in an extra expenditure to the tune of Rs.7.62 lakhs. Ministry stated in October 1990 that delay was attributable to PSU's inability to finalising the package for the dockyard and submission of quotation thereafter. The fact, however, remains that it took more than three years to finalise the actual requirements which led to the avoidable expenditure amounting to Rs.7.62 lakhs.

34. Procurement of defective ball bearings

Controllerate of Procurement (CPRO) of Material Organisation,

Bombay (MOB) placed 46 direct purchase orders on a firm between April 1986 and September 1987 for supply of 2,793 numbers of various types of ball bearings at a total cost of Rs.8.46 lakhs. The ball bearings are procured for issue to Naval Dockyard, Bombay for repair jobs. Under the existing orders, it is essential that all stores procured are properly inspected by inspectors approved and appointed for the purpose. Accordingly, the ball bearings were subject to inspection by Chief Inspector, Naval Stores under the Chief Quality Assurance Establishment, Bombay (CQAE).

In February 1988, on receipt of certain defect reports raised by the Dockyard in regard to ball bearings supplied by the firm, it was intimated to the CPRO by the CQAE that their establishment was able to carry out only sampling inspection and that all the ball bearings supplied by the firm and held in stock should be got inspected by the Dockyard for ascertaining their suitability for service use. In May 1988, the MOB ordered a reassessment of all serviceable ball bearings held in stock since considerable quantity of ball bearings supplied to Dockyard were being rejected by Dockyard Quality Control. The reassessment was to be done by a joint team consisting of representatives of Dockyard and Quality Assurance Naval Stores.

In February 1989, it was intimated by Controller of Warehousing, Bombay that as a result of joint inspection, 2451 ball bearings had been rejected and 4557 accepted. Approximately 7000 ball bearings were pending for joint inspection. Out of the 2451 ball bearings rejected in joint inspection, 1404 ball bearings costing Rs.4.02 lakhs had been supplied by the firm. No claim could be raised on the firm as the warranty period was over. However, on the matter being taken up with the firm, the Ministry stated in October 1990 that the firm has agreed to take back the defective bearings and reimburse the cost thereof provided these were not rusted and used and a sum of rupees one lakh towards partial cost of defective bearings had been remitted by the firm in August 1990.

The Ministry stated in December 1990 that whenever large quantities of items are required to be inspected, the inspection was carried out on random basis as the infrastructure required for testing every individual item was not available. The Ministry added that an enquiry had been ordered to go into the circumstances of acceptance of defective bearings and for fixing responsibility for lapses.

The case revealed that inadequate inspection procedures resulted in items costing Rs.4.02 lakhs being found defective at the time of actual use. A considerable quantity of ball bearings held in stock await detailed joint inspection.

35. Extra expenditure on procurement of an equipment

Periodical examination and renewal of bearings forms part of the maintenance routine of rotating machinery in a ship. Since there are around 6000 such bearings in a ship, this imposes heavy work load on the dockyard during a ship's normal refit. To mitigate this problem, various other navies had introduced in 1980 a new technique of "condition monitoring" under which the ship's engineering officers were made responsible for assessing the condition of bearings for monitored wear-out and natural wearout. For the introduction of this technique, Shock Pulse Monitor (SPM), a proprietary item of a foreign

istry approved the proposal and issued sanction in February 1990 to the installation of equipment worth Rs.22.70 crores. The Ministry's sanction for the approval of modernisation of vessel 'D' was yet to be issued (November 1990).

Thus, the modernisation of four vessels which had fallen due from 1984 to 1989 had not been taken up so far (November 1990). Without modernisation, the vessels 'A' and 'B' would be fit only for convoy escort, patrolling etc., limiting their operational capabilities. Vessel 'C' even though expected to be updated with new equipment, would still be short of the operational capabilities expected of a warship as the weapons system were not being updated. The Ministry while confirming the facts stated in October 1990 that weapon fit from supplier 'X' could be retrofitted when received. The Ministry had also indicated earlier in October 1989 that Naval HQ had been asked to fix responsibility for the delay in obtaining the required weapon fit.

38. Extra contractual payment

Paragraph 24 of the Report of the Comptroller and Auditor General of India, Union Government (Defence Services - Air Force and Navy) No.3 of 1989 for the year ended 31 March 1988 had commented upon various aspects relating to the establishment of a Naval communication station. A subsequent audit showed that in December 1988, the firm executing the works services of technical accommodation was paid Rs.25.53 lakhs as compensation towards additional mobilisation of men, material and machines for expediting various activities in construction.

According to the Government sanction of April 1986, the estimated cost of the transmitter and antenna tuning units (ATU) building including services, was Rs.266.35 lakhs. A contract concluded with firm in August 1986, at a cost of Rs.263 lakhs provided for completion of work between nine months to thirteen months from the date of its commencement. As the site was handed over to the firm in October 1986, the work should have been completed between July and November 1987. Even though the firm was allowed an extension of time for handing over various rooms of the technical buildings between August 1987 and January 1988, the work was completed and handed over between November and December 1987.

In July 1988, the firm preferred a claim for Rs.46.78 lakhs as compensation for heavy expenditure incurred by it for augmenting the equipment including their transportation, associated labour and material in order to hasten the completion of work to meet the deadline set for the project. MECON, a public sector undertaking that was appointed as consultants to the project, recommended payment of Rs.25.78 lakhs which was approved by the standing committee responsible for project management. In December 1988, a sum of Rs.25.53 lakhs was paid to the firm as compensation. The contract, however, did not contain any provision for payment of compensation for completion of work ahead of schedule.

The Ministry stated (November 1990) that compensation was paid to the firm as completion of work ahead of schedule paved way for timely erection of transmitter by foreign firm thereby avoiding possible payment of penalty to the foreign firm as per contract in foreign exchange and the payment was covered through an amendment made to the contract. The fact remained that

payment by way of compensation was made for which no provision existed in the contract at the time of its conclusion and the amendment to contract was carried out subsequent to the execution of work which was quite an unusual factor.

39. Power house for a communication station

The power requirements of a communication station are met by a State Electricity Board. A diesel generating (DG) power station was also to be set up at the station as a standby source of power. For this purpose, the Ministry of Defence (Ministry) sanctioned in September 1986 the procurement of four DG sets of 2500 KW capacity each with associated auxiliary tools etc., at a total cost of Rs.2.27 crores from a foreign firm 'A'. A contract for the procurement of the four DG sets for Rs.2.18 crores was concluded by the Ministry with firm 'A' in the same month. One of the DG sets delivered by the firm in August 1987 was lost at sea due to sinking of the ship carrying the first consignment. The loss of Rs.37.45 lakhs on this account was compensated by the insurance company. However, a DG set to make good the deficiency was not procured subsequently and this necessitated modification/ reengineering of installation for commissioning three sets at an additional cost of Rs.2 lakhs. The Ministry stated in October 1990 that a decision had been taken to review the requirement of a fourth DG set after one year of the commissioning of the communication station.

In December 1986, the Ministry sanctioned the construction of a power house complex at a cost of Rs.3.30 crores to house the four DG sets under procurement. Contract was concluded with firm 'B' in February 1987 for execution of the work at a cost of Rs.3.30 crores.

In October 1987, the project authorities sought sanction of the Ministry to pay compensation of Rs.23.15 lakhs to firm 'B' on the plea that the firm had encountered certain difficulties during the actual execution of the work due to rocky condition of the soil which were not envisaged during the preliminary survey. While recommending the payment, the project authorities also explained that the excavation work was got carried out by firm 'B' without an amendment to the contract for timely completion of the job. Records to show the details of hard rock extracted were, however, not kept by firm 'B'. The quantum of work done was, therefore, assessed by a team by digging sample pits. Based on the report of the team the compensation payable was assessed at Rs.16.57 lakhs and the extra contractual payment of Rs.16.57 lakhs was sanctioned by the Ministry in September 1989.

The Ministry stated in October 1990 that the claim of firm 'B' for Rs.23.15 lakhs was revised and reduced to Rs.16.57 lakhs.

Under the contract concluded with firm 'A' in September 1986, the erection of the DG sets was to be done by the firm subject to mutual agreement. The contract also provided that in case erection of the DG sets supplied by it was entrusted to any other agency, an amount of Rs.15.10 lakhs could be deducted from the contract sum of Rs.2.18 crores. In December 1986, firm 'A' conveyed their inability to undertake the erection work. Consequently, in April 1988, the Ministry concluded a separate contract with firm 'C' for erection of the three DG sets at a cost of Rs.26 lakhs with

option for erection of the fourth DG set at an additional cost of Rs.8.5 lakhs. In case the option was not exercised within a period of six months from February 1988, firm 'C' was to be paid Rs.1.80 lakhs in addition to Rs.26 lakhs. While commissioning of the sets was the responsibility of firm 'A', firm 'C' was to supply the required labour. However, the agreed date of completion of trials by firm 'C' was 31st August 1988 as against 22nd November 1988 agreed with firm 'A'. Firm 'A' could complete the trials and commission the DG sets only in September 1989 due to some defects in the lubricating oil procured for trials and defects in the sets. This necessitated the retention of firm 'C's labour at site even beyond August 1988. Though the extra payments claimed by firm 'C' for retention of their labour beyond 22nd November 1988 was paid by firm 'A', Rs.3.13 lakhs claimed for the period from 15th September to 22nd November 1988 had to be paid by the project authorities. The Ministry stated in October 1990 that the maximum permissible liquidated damages amounting to Rs.9.04 lakhs for delay in commissioning of DG sets had been levied on firm 'A' which offsets the retention charges paid to firm 'C'. The contention of the Ministry was not correct as the amount recovered from firm 'A' was a penalty for the delay in erecting the DG sets.

The communication station for which the standby power station was set up was commissioned only in October 1990. Mention had already been made in paragraph 24 of the Report of the Comptroller and Auditor General of India for the year ended 31 March 1988 (No.3 of 1989) about the time and cost overruns in the setting up of the communication station for the Navy.

To conclude:

- The power house station set up at a cost of Rs.5.65 crores in September 1989 to serve as a standby source of power for the communication station could not be put to effective use till October 1990 due to the non-commissioning of the communication station.

- Firm 'B' was paid extra contractual amount of Rs.16.57 lakhs which was based on an assessment of the work done in the absence of proper records.

- Government had to incur an avoidable expenditure of Rs.3.13 lakhs because the completion dates of both the contracts were not dovetailed.

40. Delay in modification to boilers

Naval vessels 'A', 'B','C' and 'D' and a training establishment were fitted with boilers manufactured by a foreign firm. Modification to the boilers was suggested by the manufacturers for mitigating problems associated with design deficiency in the boilers and to improve fuel efficiency, reliability, ease of operation and long life. Accordingly, based on a proposal by Naval Headquarters (HQ) made in April 1981, sanction was issued by the Ministry of Defence in March 1982 for the procurement of modification kits at a cost of Rs.112.30 lakhs. This was amended to Rs.181.47 lakhs in November 1983.

The modifications were to be done during their scheduled refits between August 1982 and March 1984. Due to the delay in ordering the modification kits, they were received late. The modi-

fication to vessels 'A' and 'C' boilers could be done during their short refit during 1984-86 and 1984-85 respectively. Due to the non-availability of complete kits, the modification in respect of vessels 'B' and 'D' and training establishment could not be taken up. Consequently, fuel saving estimated at 9.5 percent (about Rs.1 crore during the period 1984-85 to 1988-89) could not be achieved and the vessels continued to operate with limitations affecting their operational capability. Contract for procurement of the wanting items was yet to be concluded (October 1990).

The Ministry stated in November 1990 that the case was under process.

CHAPTER - V

RESEARCH AND DEVELOPMENT ORGANISATION

41. Setting up of lake test facility for torpedoes

Naval Science and Technological Laboratory is engaged in the development of torpedoes. This work entails several stages of test before torpedoes are ready for user trials. At present, the tests are carried out in the open sea on board the Navy's ships. This arrangement was not considered satisfactory as considerable time and resources were spent in arranging and carrying out trials.

Thus, in October 1977, the Defence Research and Development Organisation (DRDO) obtained the consent of a State Government for setting up a torpedo test facility at a lake so that launch and recovery of torpedoes could be carried out in sheltered waters in a cost effective manner, without depending on the Navy except for user trials and lethality estimation studies. The laboratory proposed in 1978 the setting up of the facility at an estimated cost of Rs.3.60 crores. The DRDO expected that the project could be taken up towards the end of 1978 and completed by 1981.

While the proposal was awaiting approval of the Government, the DRDO revised the estimated cost. The Ministry issued sanction in February 1982 to undertake the project for the proposed cost of Rs.5.90 crores and to complete it by February 1987.

In March 1982, the DRDO stated that the project was estimated to cost Rs.8.27 crores against Rs.5.90 crores sanctioned. This was attributed to enlarged requirements of external services which were not envisaged at the initial planning stage. The Ministry after scrutinising the estimates sanctioned a sum of Rs.7.47 crores in January 1984.

The project expected to be completed in Feburary 1987 was given extension of time on three occasions till August 1990. The expenditure booked till May 1990 was Rs.7.84 crores. Imported equipment required for the project had started arriving from June 1984 onwards. The total value of imported equipment received was Rs.1.09 crores. All these equipment are likely to be put to use only after the commissioning of the lake test facility expected in March 1991, i.e. after a delay of over six years since their receipt. The warranty period had already expired. The Ministry stated that some of the items had been used whenever the laboratory's help was sought by the Navy/State Government.

Meanwhile, in January 1980, admitting that some delays had occurred in setting up the lake test facility, the DRDO proposed construction of a small torpedo launch and recovery vessel (TLRV) for trial of indigenously developed torpedoes as an interim measure. The Ministry sanctioned in August 1981 the fabrication of the TLRV at a cost of Rs.87.70 lakhs, enhanced to Rs.109.80 lakhs in April 1984. The vessel was commissioned in November 1984. Though an interim arrangement, the

TLRV was to be transferred to the lake test facility after it was set up. A separate launch and recovery vessel was, however, sanctioned in February 1982 for Rs.153 lakhs as a part of the project on creation of lake test facility and it was expected to materialise by February 1991. The Ministry stated in October 1990 that certain design changes had to be made while fabricating the TLRV to make it seaworthy. Owing to these changes, it became a bigger ship and therefore it could not be transported to the lake.

The lake test facility was inter alia intended to help the speedy implementation of conversion of torpedoes 'A' to torpedoes 'B'. The development project taken up by the laboratory in August 1976 was completed only in May 1989. The actual conversion of the first batch of torpedoes 'A' to torpedoes 'B' taken up in September 1982 for completion by December 1984 was yet to be completed (October 1990). The Ministry stated in October 1990 that production was in progress. Regarding the delay in completion of the development project, the Ministry stated in October 1989 that the project on conversion of torpedo was delayed since it required as many as 100 trials and due to limited trial season and constraint of resources by way of firing platform, recovery vessel, helicopter etc., only 10 trials were possible during a year.

To conclude:

Setting of the lake test facility approved in February 1982 and targeted to be completed by 1987 for Rs.5.90 crores was now expected to be completed by March 1991 at an estimated cost of Rs.7.84 crores. A number of items of imported equipment worth Rs.1.09 crores received from June 1984 onwards were lying idle pending completion of the lake test facility.

Owing to delay in setting up of the lake test facility, a TLRV had to be acquired at a cost of Rs.1.10 crores as an interim measure. This TLRV could not be transported to the lake owing to its size.

One of the projects which was to be benefitted by the lake test facility got delayed due to the inordinate time taken for trials. Had the facilities been set up in time, the delay could have been reduced.

42. Foreclosure of projects due to similar development by other agencies

Three Research and Development (R&D) projects had to be foreclosed by the Electronics and Radar Development Establishment (LRDE) after incurring an expenditure of Rs.392.36 lakhs, as similar projects had been undertaken by public sector undertakings (PSU) and other organisations in the country. This could have been avoided had there been any established system for ascertaining whether any other organisation/agency in the country was engaged in similar defence projects. Details of the cases are as under:

(i) Development of radars for the Navy

Based on the proposals submitted by the LRDE, Government accorded a sanction in September 1979 for a feasibility study for development of radars 'A' and 'B' at an estimated cost of Rs.105 lakhs and Rs.131.50 lakhs, subsequently

revised to Rs.271.25 lakhs and Rs.278.75 lakhs respectively. These projects were taken up basically as competence building R&D projects to meet the future needs of the Navy. The original probable dates of completion (PDC) of these projects were August 1984 and February 1985, which were revised to December 1989.

Although these projects were taken up as R&D projects, LRDE felt in May 1983 that the Navy should issue their qualitative requirement (QR) for the total integrated system. In July 1985, Naval Headquarters intimated that even though there was no firm requirement for these radars by the Navy, the projects might continue. In the meeting of the Project Advisory Review Committee (PARC) held in April 1989, it was realised that a PSU was also developing similar type of radars and they would not be interested in reengineering the radars developed by LRDE.

As there was no firm user QR for these projects and also due to their development by the PSU, the LRDE recommended closure of their projects in October 1989/April 1990 after incurring total expenditure of Rs.351.05 lakhs. The closure of these projects was approved in August 1990.

Ministry stated in November 1990 that in area of critical technology, it is an accepted norm to allow parallel development to increase the chances of success.

In this case, however, LRDE was not even aware of the projects undertaken by PSU till April 1989.

(ii) Development of a sub-system

In August 1985, Government accorded a sanction for the development of a sub-system of a weapon finder system at an estimated cost of Rs.78 lakhs (FE Rs.66.30 lakhs) by August 1988. This project envisaged development of coherent receiver and a high power transmitter. The development of the receiver chain was successfully completed and tested by October 1988. In October itself, the LRDE requested R&D HQrs for the closure of the project mainly due to the fact that a high power transmitter with near equivalent specification was being developed by the PSU which was at an advanced stage of completion. This was also approved in the meeting of PARC held in October 1988. Accordingly, the project was stage closed after incurring an expenditure of Rs.36.24 lakhs (FE Rs.4.82 lakhs).

Ministry stated in November 1990 that the project was stage closed to avoid duplication of R&D efforts.

(iii) Map digitiser and display system (MDDS)

Government sanction was accorded in September 1984 for the execution of the project "Map digitiser and display system" (MDDS) at an estimated cost of Rs.96.10 lakhs. The project was to be completed by September 1988. However, after establishing the feasibility of the technique, the PARC recommended in August 1988 to close the project as the map data capture was being planned at national level by Survey of India. The project was closed in October 1988 after incurring an expenditure of Rs.5.07 lakhs (FE Rs.3.70 lakhs).

Ministry stated in November 1990 that the project was closed after the objective of establishment of knowhow of map digitisation was established. However, the fact remains that establishment of knowhow of map digitisation was only a part of the entire project.

43. Infructuous expenditure on a development project

Nonmagnetic steel structurals, including bulb bars, required for the repair and refit of certain hulls were being imported by the Navy. In October 1982, Naval Headquarters requested a Defence public sector undertaking (PSU 'A') and the Defence Research and Development Organisation (DRDO) to develop and produce the structurals in the shortest possible time to meet the Navy's urgent requirements. In December 1982, one of the laboratories of the DRDO proposed to undertake this work. No feasibility studies were, however, undertaken by either the laboratory or the DRDO before submitting the proposal to the Ministry of Defence (Ministry). The Ministry sanctioned the project in July 1983 at an estimated cost of Rs.49.5 lakhs. The project was to be completed by July 1986.

After taking up the work in July 1983, the laboratory realised that the technology for rolling of bulb bars was not available domestically. It, therefore, sought the assistance of PSU 'B'. After six months, PSU 'B' communicated its inability to undertake the work. Based on further requests, PSU 'B' agreed to help the laboratory provided the latter arranged foreign exchange (FE) towards fees for their foreign collaborator. Consequently, the Ministry sanctioned an additional Rs.8 lakhs (Rs.1.6 lakhs in FE) in January 1985. Thereafter, in November 1988, the laboratory concluded, on the basis of reports received from PSU 'B', that considering the technical difficulties, techno-economic aspects and also the engineering inputs required, the Navy might continue to meet its requirement of bulb bars by import. A sum of Rs.8.16 lakhs was paid to the foreign firm and PSU 'B' for the supply of drawings for the design and development of bulb bars.

The Ministry stated in March 1990 that since Naval HQ had indicated their requirement as critical the DRDO did not undertake any feasibility studies before starting the project. Since the Navy had projected its requirement in October 1982 and the laboratory had concluded its contract for the drawings with PSU 'B' for the design, development and engineering of the bulb bars only in November 1985, a full three years were available to the DRDO for evaluating the technoeconomic aspects of the project.

The DRDO stated in August 1990 that while no feasibility study was undertaken, extensive discussions had taken place with the PSUs who were experts in the field. It added that the engineering report furnished by PSU 'B' with the help of its foreign collaborator had indicated that the high cost of importing of equipment required for the operation of development of the bulb bar as well as the time required for procurement of the equipment did not justify further processing of the component development. The fact remains that PSU 'B' had in the initial stages itself expressed its inability to undertake the design and development work on bulb bars, as it was very difficult and the technology

was not indigenously available at any of the integrated steel plants in India. Had the economics and technological feasibility of the development of bulb bars been determined at the initial stage itself, the expenditure of Rs.8.16 lakhs could have been avoided.

The matter was referred to the Ministry in May 1990; no reply has been received (December 1990).

44. Procurement of emission monitoring system

Acoustic emission monitoring system (system) is the testing technology for missile pressure vessels which is used in conjunction with other testing facilities. This system offers the advantages of indicating impending premature failures and detection and identification of flaw location before actual rejection or destruction of components.

Based on an indent of July 1978 of a Defence Research and Development (R & D) laboratory, the Director General Supply and Disposals (DGSD) placed an order in October 1979 on an Indian agent of a foreign firm for supply of the system at a cost of Rs.11.61 lakhs in foreign exchange (FE). The complete system comprising of 16 packages was despatched by the firm in January 1982. However, two packages containing vital parts of the system costing Rs.9.53 lakhs were lost in transit. In August 1982, a claim was preferred on air carrier which was settled for Rs.6.98 lakhs.

In the meanwhile, in order to make the system operational, the Equipment Procurement Committee (EPC) recommended in 1983 the procurement of the deficient items. In January 1984, the R & D Headquarters (HQ) released foreign exchange to the extent of Rs.15 lakhs based on the firm's quotation of September 1983. An indent was raised by the R & D laboratory on the DGSD in February 1984 but as it was issued without the proprietary article certificate (PAC), it had to be withdrawn.

A fresh indent was raised on DGSD in December 1985, but the DGSD could not place the supply order for want of additional FE to the extent of Rs.2.60 lakhs which was necessitated due to the increase in cost in the intervening period. However, the case for release of additional FE remained under discussion between the laboratory and the R & D HQ till June 1988 when the proposal was ultimately turned down because of critical condition of FE and the R & D laboratory advised to get their requirement reviewed afresh by the EPC. A fresh demand had not been raised so far (September 1990).

Ministry stated (September 1990) that an alternate proposal for indigenous development of this system at a cost of Rs.15 lakhs had been submitted for clearance by the EPC.

The case revealed:-

the essential system procured in 1982 for Rs.11.61 lakhs could not be operationalised due to non release of additional FE by R&D HQ for procurement of the parts

lost in transit as an alternate proposal to develop the system indigenously with latest technology was still under consideration.

due to the non-availibility of the system, tests were being carried out by other complementary techniques which are uneconomical and time consuming.

(A.K. MENON)
Director General
Principal Director of Audit, Air Force & Navy

NEW DELHI
Dated the 30 MAY 1991

Countersigned

(C.G. SOMIAH)
Comptroller and Auditor General of India

NEW DELHI 7 JUN 1991
Dated the 7 JUN 1991