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REPORT OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA

FOR THE YEAR ENDED 31 MARCH 1988

NO.7 OF 1989

UNION GOVERNMENT

(SCIENTIFIC DEPARTMENTS)

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PREFATORY REMARKS

As mentioned in the Prefatory Remarks of the Report of the Comptroller and Auditor General of India for the year ended 31 March 1988 — Union Government - Civil (No. 1 of 1989) this Report includes other points arising from audit of the financial transactions of the Scientific Departments of the Union Government and Autonomous Bodies under these departments.

2. The Report includes among others, reviews on Narora Atomic Power Project, Heavy Water Plant, Baroda and paragraphs on ammonium perchlorate production, non-collection of water cess, non-installation of computers, equipments etc. acquisition of a research vessel,non-utilisation of land, delays in prepositioning infrastructural facilities, deficient contracts etc.

3. The cases mentioned in this Report are among those which came to notice in the course of test audit during the year 1987-88 as well as those which came to notice in earlier years but could not be dealt with in previous years; matters relating to the period subsequent to 1987-88 have also been included, wherever considered necessary.

OVERVIEW

Audit Report for the year ended 31 March 1988 contains 52 paragraphs including 2 reviews. The points highlighted in the Report are summarised below:

I. Narora Atomic Power Project

Narora Atomic Power Project consisting of two units of 235 MWe each was sanctioned in 1974 at a cost of Rs.209.89 crores with date of criticality as December 1981 and December 1982. Till December 1988, neither of the units had reached criticality. Rs.487.36 crores have already been spent by March 1988 and a proposal to revise the project cost to Rs.532.84 crores is pending. The time and cost over-runs were attributed to continuous upgrading in systems design to cater to seismic conditions and safety. Consequential delay in construction activities stretched upto 43 months and cost over runs upto Rs.400 lakhs in individual cases. There was no dynamic monitoring resulting in tail end facilities coming up earlier; also equipments like chiller units, cranes, etc. were acquired ahead of requirements. A random check of purchase orders revealed substantial delay in placement of purchase orders. Performance budgets failed to take cognisance of previous performances and annual reports were inaccurate. In sum, though the seismic conditions of the site were known at project formulation stage, which called for special designs for equipments and buildings optimistic time schedules were drawn up and projected project cost estimations proved inadequate (Paragraph 2).

II Heavy Water Plant, Baroda

In attempting to acquire the technology of heavy water production, Heavy Water Plant, Baroda (BHWP) was approved as the twin plant of the Tuticorin Heavy Water Plant. The plant was due to be commissioned in 1973 at a cost of Rs.15.09 crores. It was commissioned in July 1977 with actual production commencing in November 1977. The total cost was Rs.33.87 crores. Thus the time over run was 53 months and cost over run Rs.18.78 crores. After an explosion, the plant was shut down and restarted in January 1980. The Estimates Committee (1983-84) in their 82nd Report (7th Lok Sabha) commented upon poor performance of BHWP. Subsequently, additional investments, change in strategy of production, repairs, etc. were undertaken. But the annual production did not reach the rated capacity. The cost of production was in excess of Rs.6886 per kg as against the projected cost of Rs.478 per kg and revised cost of Rs.1023 per kg. The cost of production is high because the total project investment had more than doubled while the annual average production is less than 30 *per cent* of the capacity. Additionally, running costs are high due to price variance, quantity variance of energy consumed, undetected ammonia leakage etc. However the foreign collaborator had been absolved of all contractual obligations though the BHWP faced equipments failures, delays in supply of equipments, fire and explosion. No proforma accounts have been prepared in the last 8 years. (Paragraph 3).

III Irregular Insurance Cover

As against the actual expenditure of Rs.160 crores on Thal Vaishet Heavy Water Project, an insurance cover for Rs.163.09 crores was taken. The cover was taken in contravention of Government rules and instructions and was presented as a *fait accompli*. Had the cover been only for marine transit risks, the premium would have been Rs.35.64 lakhs instead of Rs.99.20 lakhs actually paid. The irregular expenditure was Rs.63.56 lakhs. (Paragraph 4).

IV Uninstalled Computers

In September 1986, National Informatics Centre imported ND-550 Computer system at a cost of Rs.49.00 lakhs for the Calcutta Centre of National Informatics Computer Network. Since suitable accommodation could not be located, the computer remained stored till June 1988. The storage expenditure was Rs.2.40 lakhs. (Paragraph 7).

India Meteorology Department contracted

for a computer system and installation at a cost of Rs.26.38 lakhs for their New Delhi Centre. Subsequently, the facility was transferred to Calcutta, without ascertaining the availability of accommodation. The computer system received in June 1983, remains to be installed (Paragraph 16).

V Excess release of funds

Department of Bio-technology released Rs.107.39 lakhs for establishing National Animal Tissue Culture Facility in March 1986. Till December 1987, only Rs.41.07 lakhs was spent on peripheral items. The balance was diverted as deposit to a nationalised bank. The Department accepted that there was excess release of funds. This meant denial of funds to other developmental needs or enlargement of budgetary deficit. (Paragraph 15).

VI Faulty Facsimile Recorders and deficient contract

India Meterology Department contracted in July 1980 for import of five facsimile recorders at a cost of Rs.13.67 lakhs. The recorders were to receive cloud pictures for day-to-day weather forecasting. Subsequently, at the instance of the supplier, the model was changed. The recorders are lying idle for want of spare parts. The supplier discontinued production of the model but failed to inform the buyer. In the absence of any penalty clause, no relief is available. Also 326 rolls of imported dry silver paper costing Rs.9.70 lakhs are lying idle because of the defective equipment. (Paragraph 17).

VII Ammonium Perchlorate Plant

Ammonium Perchlorate Plant approved in May 1975 at a cost of Rs.84.38 lakhs with gestation period of 24 months became operational in February 1979 with a delay of 20 months and capital cost of Rs.95.92 lakhs. Since the rated capacity of 150 tonnes per annum could not be reached, additional capital expenditure amounting to Rs.62.94 lakhs became necessary. Complete details of capital or operational expenditure are not available. The cost of production was Rs.62.69 per kilogram as against the projected cost of Rs.15.35 and market price of Rs.34.87 per kilogram. The plant also faced problems of environmental pollution which have since been set right. Rated capacity has been achieved after 12 years with major changes in equipments, processes, anode characters etc. (Paragraph 24).

VIII Gas Liquid Chromatograph uninstalled for ten years

Central Rice Research Institute imported a Gas Liquid Chromatograph in March 1977 at a cost of Rs.1.27 lakhs. Due to delay in procurement of compressor, the installation was postponed till September 1979. Two more attempts at installation in January 1981 and March 1984 failed. On Audit pointing out the import was infructuous, a legal notice was issued to the supplier in October 1986. In September 1988, a case has also been filed. (Paragraph 27).

IX Twenty year programme for Animal House

In November 1967, National Institute of Virology acquired land for constructing animal house and staff quarters. By February 1971, NIV developed second thoughts about the need for animal house and enquired whether the land could be surrendered. In July 1971, instructions were received that the land should not be surrendered. As an alternative use, a Diagnostic Reagent Laboratory was approved but before it could be suitably financed the allotment had lapsed. Detailed drawings and estimates have since been prepared after 20 years. (Paragraph 36).

X Delays in a Thrust Area Project

National Metallurgical Laboratory ordered for Agitair type floatation cells and Thickener with accessories at a cost of Rs.10.55 lakhs for augmenting and modernising mineral beneficiation facilities. The cells arrived by December 1982 and thickener by February 1983. These equipments have not been installed since the processing sheds are still under construction. Six other major equipments also remain to be purchased. Piecemeal purchases and uncoordinated construction have stretched installation of a thrust area project beyond 8 years. (Paragraph 42).

XI Micro-electronics Laboratory

Accepting a proposal of a scientist for establishing a Micro-electronics laboratory, highly sophisticated instruments were imported at a

cost of Rs.102 lakhs. Within two months thereafter, the scientist desired to discontinue his services. The scientist was granted leave for ten months and was counter-offered posting in a different institute. However, no action was taken to redirect the equipments. Equipments received in June 1987 were redirected in August 1987 when the scientist joined his job. Till September 1988, the equipments had not been completely installed. (Paragraph 47).

XII Other points

(i) Avoidable expenditure on Security

Despite amendment to the role and responsiility of the Central Industrial Security Force (CISF) brought about in June 1983, Department of Space continued to deploy 38 persons of Andhra Pradesh Special Armed Police in addition to 374 CISF personnel which was of marginal value. The continued engagement of APSAP was objected to by Audit and in November 1988, the Department concurred. The avoidable expenditure was Rs.41.09 lakhs. (Paragraph 21).

(ii) Superfluous Inspection Clause

Directorate of Supplies of Disposals ordered for certain spares and accessories at a cost of Rs.2.57 lakhs on a foreign supplier on behalf of Central Tuber Crops Research Institute. Since the Letter of Credit contained an inspection clause which was not deleted even on request the spares could not be despatched for more than four years. In the absence of the spares the scope of a research equipment remained limited. (Paragraph 26).

(iii) No checking before payment of bills

Indian Agricultural Research Institute paid Rs.7.57 lakhs as electricity charges for defunct connections and Rs.7.10 lakhs paid as water charges during the period May 1981 to September 1984 remained to be adjusted. The system of checking and passing bills was inadequate. (Paragraph 28).

(iv) Uncoordinated construction of a pilot plant shed.

Central Public Works Department completed construction of a fire-proof pilot plant shed in May 1983 which was taken over by Central Institute of Fisheries Technology in February 1986. Necessary power supply for the shed was proposed in 1982, administrative approval was given in September 1985, new transformer was received in February 1987, cables thereof were received in October 1987 and the transformer was charged in November 1987. The steam boiler for the pilot plant was received in August 1985, approval for the erection was received in November 1986 and was test fired in March 1988. After a series of delays the project has been put through in an uncoordinated fashion resulting in idle investment of Rs.24.28 lakhs for varying periods. (Paragraph 35).

(v) Delay in collection of water cess

According to Central Board for Prevention and Control of Water Pollution, the work of collecting water cess had suffered for want of a regular Member Secretary. Out of Rs.594.81 lakhs outstanding Rs.80 lakhs were collected after Audit took up the matter. Rs.132 lakhs are *subjudice*. The Board also pleaded non-availability of manpower for not maintaining complete records (Paragraph 35).

(vi) Equipment without a laboratory

Cytology Research Centre imported Liquid Scintillation Counter in July 1983 at a cost of Rs.2.99 lakhs and a scientist was got trained. In the absence of isotope laboratory with necessary safeguards against radiation, the instrument was not used. Audit took up the matter in May 1987 and in September 1988, the instrument was transferred to Lok Nayak Jayaprakash Narain Hospital. (Paragraph 37).

(vii) Non-monitoring of remittances

Remittance of funds was poorly monitored in Council of Scientific and Industrial Research. After Audit pointed this out, Rs.20 lakhs transferred to Central Mining Research Station, Dhanbad was received after 20 months. Rs.10 lakhs transferred to Industrial Toxicology Research Centre, Lucknow remained to be accounted even after 21 months. A review of such remittances for the years 1985, 1986 and 1987 showed Rs.91.65 lakhs had remained unaccounted in excess of 10 months. (Paragraph 39).

(viii) Construction with wrong architectural plans

Regional Research Laboratory (RRL), Jammu undertook extention of the existing auditorium in December 1983 without detailed drawings and which was continued despite Chief Engineer, CSIR pointing out discrepancies in the basic architectural concepts. In August 1985, the work had to be suspended because if the Auditorium were completed as per drawings, clear vision of the stage would not have been possible. The Architect made a proposal to dismantle the roof of the existing auditorium as a solution which was refused by the Chief Engineer. Alternatively, lowering of the existing stage has been suggested to marginally improve the view. (Paragraph 46).

CHAPTER I

1. General

Development and science are closely interlinked and under-development by definition is non-application of modern science and technology for the benefit of the people to increase their productivity, comforts and life-span. This awareness has led to increasing national expenditure on Science and Technology (S&T) in the recent years.

Plan allocation which was only Rs.14 crores in the First Five Year Plan increased to Rs.4398 crores (estimated) in the Seventh Five Year Plan as shown below:

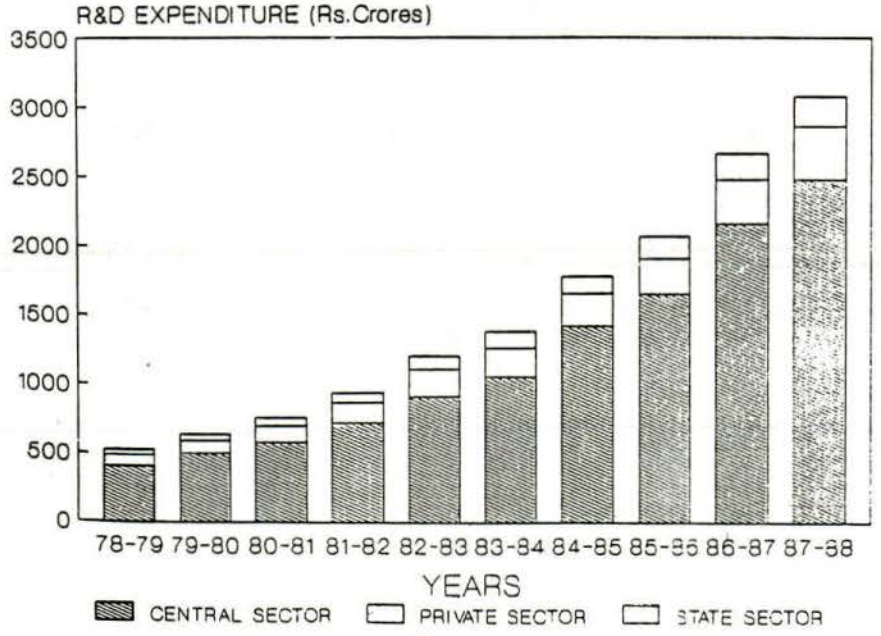
(In crores of rupees)

Five Year Plan period	S&T allocations		
	Plan	Non-Plan	Total
1st Plan	14	6	20
2nd Plan	33	34	67
3rd Plan	71	73	144
4th Plan	142	231	373
5th Plan	693	688	1381
6th Plan	2064	1652	3716
7th Plan (Estimated)	4398	3098	7496
1985-86	688	341	1029
1986-87	833	396	1229
1987-88	1089	453	1542

Science and Technology efforts have assumed considerable importance in the State sector also and 18 States have formed Department of Science and Technology to make an analysis of the S&T components of the State Plan to provide linkages between research and educational institutions and productive sectors in agriculture and industry.

As per the R&D Statistics 1986-87 published by the Department of Science & Technology, the trend in national expenditure on research and development was as per the bar chart shown below:

TREND IN NATIONAL EXPENDITURE
ON RESEARCH AND DEVELOPMENT



Expenditure on R&D and related S&T activities was 0.96 *per cent* of Gross National Product (GNP) in 1985-86 and 1.10 *per cent* in 1986-87.

According to Department of Science & Technology about 13 *per cent* of the expenditure was on basic research, about 30 *per cent* on applied research, 33 *per cent* on experimental development and 24 *per cent* on other activities.

The increasing national expenditure on Science has been directed towards Agriculture, Energy, Space and Industry sectors. The department-wise expenditure (both plan and non-Plan) during the years 1985-86 to 1987-88 are given below.

The increased national funding for science, creation of diversified infrastructure and the emphasis on scientific components in all the welfare activities underscore the transition that has taken place in pacing up development. The full scope of benefits would accrue to the people only when the management component is harmonised with the demands of research and development culture. However, Audit during test check, has come across a number of cases where feed back was inadequate, monitoring was not regular, and controls were not effective. Failure to preposition infrastructural facilities to utilise imported equipments, failure to utilise land already acquired or accommodation already rented etc. indicate that there was non-optimisation of resources.

(In crores of rupees)

	Department	1985-86	1986-87	1987-88
(i)	Atomic Energy	963.03	1098.58	1110.09
(ii)	Space	229.10	310.00	347.08
(iii)	Electronics	110.91	100.87	127.61
(iv)	Non-Conventional Energy	119.79	124.80	99.36
(v)	Bio-technology	0.04	14.32	24.43
(vi)	Ocean Development	14.12	16.29	16.24
(vii)	Science and Technology, Survey of India, India Meteorological Department and Department of Scientific and Industrial Research	294.54	320.02	337.19
(viii)	Environment and Forest including Zoological Survey of India and Botanical Survey of India	79.51	121.72	153.24
(ix)	Indian Council of Agricultural Research	250.44	284.23	320.12
(x)	Indian Council of Medical Research	39.90	38.52	43.14

CHAPTER II

DEPARTMENT OF ATOMIC ENERGY

2. Narora Atomic Power Project

2.1 Introduction

Narora Atomic Power Project (NAPP) is located on the right bank of the river Ganga in Bulandshahr District of Uttar Pradesh and is the fourth nuclear power station of the Pressurised Heavy Water Reactor (PHWR) type in the country and consists of two units of 235 MWe each. The project was sanctioned in 1974 with scheduled date of criticality as December 1981 and December 1982 respectively for the two units. The original sanctioned project cost was Rs.209.89 crores for two 235 MWe power stations. The project cost has been revised to Rs.399.64 crores in 1982. DAE had made a proposal, in 1985, to further revise the project cost to Rs.532.84 crores which is pending approval. Neither of the units has been commissioned till December 1988 and the expenditure upto March 1988 was Rs.487.36 crores.

2.2. Scope of Audit

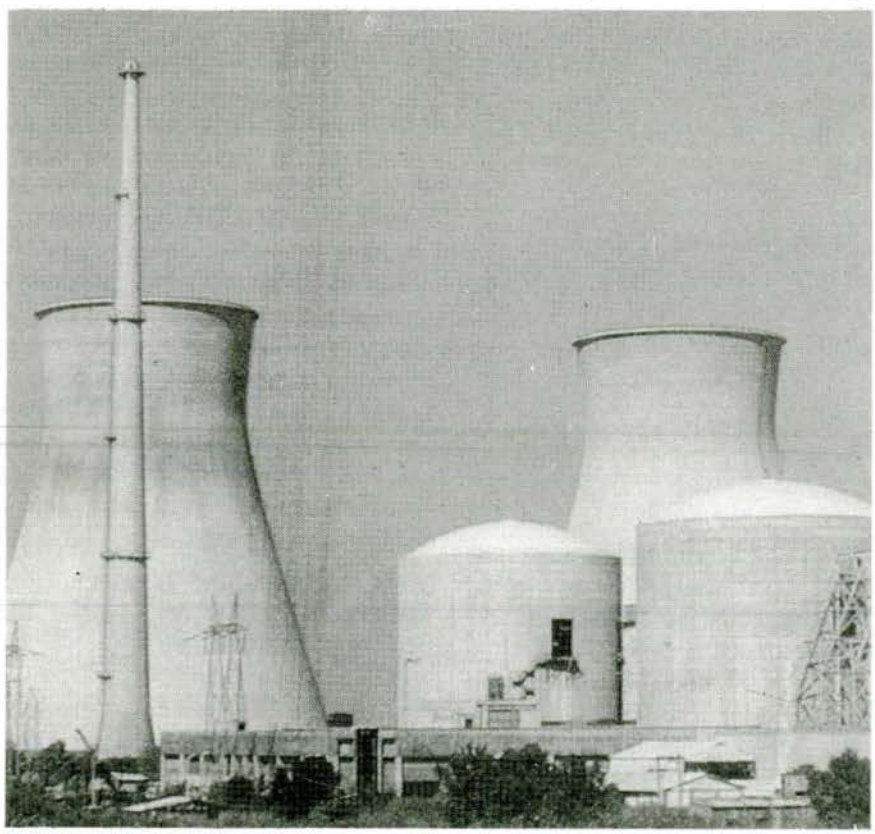
This review covers the progress at NAPP during the period January 1974 to March 1988 and the major reasons for the delay in commissioning as well as the cost escalations.

2.3 Organisational set up

The execution of the power projects was the responsibility of the Power Projects Engineering Division (PPED) in the Nuclear Power Board (NPB) of the Department of Atomic Energy (DAE). This has since been taken over by Nuclear Power Corporation of India Limited with its formation in September 1987. The construction and commissioning of the project is supervised by a Project Director at Narora.

2.4 Highlights

– **Narora Atomic Power Project (2x235 MWe Units) was sanctioned in 1974 with the sche-**



duled date of criticality as December 1981 and December 1982 respectively. This had not been achieved till December 1988.

- The original sanctioned project cost of Rs.209.89 crores was subsequently revised to Rs.399.64 crores in 1982. Only 87 *per cent* of the project had been completed and Rs.487.36 crores had been spent upto March 1988. A proposal to increase the project cost to Rs.532.84 crores had been made in 1985 and is pending approval of Government.

- There have been series of design changes affecting the progress of work and design changes have continued for 13 years after the commencement of the project.

- Due to design changes, system-oriented buildings like Reactor Turbine Service building, Heavy Water Upgradation building, Waste Management building and Natural Draught Cooling towers were delayed by 43 months, 22 months, 27 months and 17 months respectively. The cost over-runs on the above four buildings were Rs.400 lakhs, Rs.3 lakhs, Rs.38 lakhs and Rs.107 lakhs respectively.

- There have also been delays in electrical work, piping work and instrumentation work. Even by April 1988 only about 60 *per cent* of instrumentation work had been completed.

- A test-check of 39 purchase orders revealed a series of delays ranging from 4 to 28 months between raising of indent and placement of purchase order in 14 cases.

- There were 10 important major heads of expenditure on which cost over-run was in excess of 188 *per cent.*

- There was no dynamic monitoring of the progress resulting in tail-end facilities coming up earlier and maintained at a cost. Rs.6.42 crores was the idle investment for more than 7 years and interest during construction on these facilities was Rs.313 lakhs.

- Quality surveillance of C S Pipes meant for liquid waste transportation was not done both at the time of supply and resupply. Finally these were dismantled at a cost and were replaced by stainless steel pipes.

- Out of four cranes bought in April/May 1980, only two were erected in time. The idle investment of Rs.14.45 lakhs on the other two cranes continued for about two years.

- One chiller unit costing Rs.21.64 lakhs bought in August/October 1984 remained to be commissioned.

- An imported equipment costing Rs.17.13 lakhs was lying idle for two years.

- Mechanical and electrical stores and equipments valued at Rs.20.06 lakhs were lying idle for periods ranging from 5 to 11 years.

2.5 Delays

(i) Delays in commissioning

The time over-run on the project is about 86 *per cent.* Unit-I which was to have reached criticality in December 1981 had not reached criticality till December 1988. Unit-II expected to reach criticality in December 1982 is now expected to reach criticality in May 1990.

(ii) Delays due to design changes

The Project Report stated that NAPP was to be designed on the lines of Rajasthan Atomic Power Project (RAPP) and Madras Atomic Power (MAPP) since the production programme for the manufacture of allied reactor components and materials had progressed significantly and it was desirable to utilise the experience gained in building the Madras Atomic Power Station (MAPS) and Rajasthan Atomic Power Station (RAPS). It was also stated that the technical plant details were more or less identical with those of RAPS and MAPS with few modifications to suit the seismic conditions obtaining at Narora.

The following extracts from the Annual Reports of DAE also stated that the designs had been finalised.

1973-74 The reactors proposed for Narora though based on the basic CANDU system adopted at Rajasthan and Kalpakkam include several design

improvements. The design also has to take into account the seismic conditions at site. The design and development work in this regard is progressing in PPED. Conceptual designs and details of developments and proto-type testing work to precede freezing of design have been finalised.

1974-75 In view of the modifications made in the RAPP and MAPP designs for the Narora Reactor Vault equipment, development and proto-type testing work for finalising these design changes have been started.

1977-78 Detailed engineering for the major systems like secondary cycle system, compressed air system, domestic water system, chilled water system, demineralised water system, fire and standby water system and ventilation system etc. in progress.

Standardisation of design was to enable repetitive ordering and streamlining of the production programme of the equipments and components, leading to reduction in delays and cost escalations. However, designs had not been standardised and frozen and in the following 10 illustrative cases changes had been effected upto February 1987.

Sl.No.	Particulars	Remarks
(i)	Calendria top hatch covers and main lock housing system	Drawings revised in October 1984.
(ii)	Closure panel and main airlock sealing arrangement	Drawings revised in December 1984.
(iii)	Liquid shut off system	Ordered 'HOLD' in February 1986 for revision of drawings.
(iv)	Emergency core cooling system (ECCS)	Drawings revised in February 1987.
(v)	Primary Heat Transport System (PHT)	Drawings revised in February 1987.
(vi)	Support moderator system	Change of design in January 1986.
(vii)	Strainers for reactor auxiliary	Revised drawings in April 1986.
(viii)	Main control room panel	Drawings revised till November 1986 requiring re-routings of CPM system cables. Revised routings were awaited for 16 cables till April 1987.
(ix)	Moderator room elevator shafts door	Designs prepared in November 1986.
(x)	Fuel handling system fuel maintenance door	Revised design basis issued in November 1986.

The non-finalisation and non-freezing of designs and drawings even after 13 years of commencement of the project led to a series of fall-outs. For instance, in November 1986, installation of the liquid shut off system had to be held up due to changes in design. This, in turn, led to modifications in tubing and also affected the terminal points being released for piping, instrumentation and electrical work. Similarly, the delay in finalising the designs/ drawings for the ECCS led to delays in completion of PHTS, necessitating delinking the systems from each other.

Similarly, in the case of secondary system, the design organisation insisted upon dynamic analysis of the system since NAPP was being constructed in seismic conditions. As per the results of the analysis, considerable additional supporting structures were considered necessary and in a few cases re-routing of lines was necessitated to accommodate the new support structures. Thus, a review of the secondary system which was not earlier planned for, led to changes in designs and lay-out. In the case of secondary shut-off system, final approval from NPB was received as late as January 1987. Consequently, there had been no progress on the construction of this system which, in turn, affected the progress of the activities in the Reactivity Mechanisms and Moderator system. In March 1988, it was stated that revised drawings for secondary shut-off system had been received and the construction of piping lines was nearing completion.

DAE stated in December 1988 that a number of design improvements were necessitated by seismicity and safety considerations and only the basic concepts of designing PHWR were available from RAPS and MAPS. In addition, the non-availability of cooling water from Ganga necessitated certain changes. It was also stated that safety considerations which were evolutionary had led to engineering of additional systems. As an example, re-engineering of ECCS on the basis of Three Mile Island accident had been cited. That accident had occurred in 1979 whereas the drawings of the cooling system were revised in February 1987. Further, if designs as evolved for RAPS and MAPS could not be followed for NAPP, it was not correct to say in the project report that the production programme of reactor components etc. had advanced on the basis of these designs and they would be adopted. It was also incorrect to state in the Annual Reports of DAE that conceptual designs and proto-type testing work, after taking into account the seismicity of NAPP had been finalised. It was even stated in 1974-75 and in 1977-78 that detailed engineering of various major systems had been started while normally detailed engineering follows design freezing. Thus, without stabilising designs and cooling water arrangements approval to the project was obtained.

While considerations for maximum safety cannot be disputed, since these were evolutionary a trade off between safety and schedule adherence was called for especially in the context of other nuclear plants in the country continuing to operate with earlier standards of safety. The extraordinary delay in stabilising various designs is borne out by DAE's reply in December 1988 that design drawings of Reactor Monitoring System and Reactor regulating system have since been received. Further, DAE had dealt with only one system in its reply while 10 such delays were cited.

(iii) Delays in construction

There are three major structure/plant areas in the nuclear power plant, namely, reactor building, turbine building and service building. The construction and installation activities in the reactor building are in general on the critical path. Delays in finalising the designs also led to delays in the procurement of equipments and consequently delay in the construction of system-oriented buildings. Thus the reactor turbine service building, heavy water upgradation building, waste management plant building and natural draught cooling towers were delayed by 43, 22, 27 and 17 months respectively. DAE admitted in December 1988 that design changes increased the size and number of components which in turn led to redesigning of the buildings.

(a) Construction of Reactor Turbine Service Buildings

The contract for construction of Reactor Turbine and service buildings was awarded in February 1976 at an estimated cost of Rs.10.01 crores. The work was to be completed by March 1981. The work was, however, completed in September 1984 after a delay of 43 months and with a cost over-run of Rs.4 crores. The Annual Report of DAE for 1980-81 stated as under:

"Civil work have been completed to the extent of 89 *per cent* on reactor building No.I, 65 *per cent* on reactor building No.II, 95 *per cent* on turbine building No.I and 65 *per cent* on turbine building No.II".

The pace of construction seems to have slowed down after March 1981. The main reasons for the delay were: delay of 22 months, attributable to DAE in the issue of structural steel owing to delay in its import, fabrication, transport, etc., delay in finalisation of drawings, increase in quantum of work by about 22 *per cent* of the contract value, difficulties in pile foundation, non-availability of cement and re-inforced steel, labour problems, development problems of pre-stressing anchorages and delay in the release of drawings for the pipe and cable bridges.

It will be seen from the above that there were many in-house failures such as finalisation of drawings, issues of structural steel, delay in issue of cement etc. indicating avoidable failures.

(b) Heavy water upgradation plant building

The contract was awarded in August 1982 at an extimated cost of Rs.0.44 crore with completion date as February 1984. The work was completed in November 1985 at a cost of Rs.0.47 crore and with a delay of 22 months. Some of the important reasons for the delay were, late release of drawings and late receipt of fabrication drawings leading to delay in issue of embedded parts. Here again the delays were due to in-house failures like of effective monitoring and timely corrective action.

(c) Waste management plant building and facilities

The contract was awarded in March 1982 at an estimated cost of Rs.0.82 crore and was to be completed by March 1984. The work was completed in June 1986 after a delay of 27 months. Main reasons for the delay were, design changes, late issue of drawings due to multiplicity of agencies involved, namely Bhabha Atomic Research Centre (BARC), NPB and Project Authorities, delay in supply of embedded parts and non-availability of cement.

These delays resulted in additional payment of Rs.0.38 crore, out of which Rs.0.13 crore was on account of escalation. The extension of time granted to the contractor was without levy of liquidated damages as the delay was beyond the control of the contractor.

(d) Natural draught cooling towers

One of the main considerations for locating NAPP on the banks of the river Ganga was the availability of water. However, the estimate of availability of water had to undergo many revisions and in 1976, Atomic Energy Commission (AEC) decided to construct natural draught cooling towers. The towers are 128 metres high and are required to cool 42,600 tonnes of water per hour through 10.8°C. The work of design, construction, manufacture, supply, erection, testing and commissioning of the towers was awarded in October 1978 at a cost of Rs.3.68 crores. The first tower was to be completed by February 1982 and the second by October 1982. These were completed in December 1983 and March 1985 respectively and at a total cost of Rs.4.75 crores. The time and cost over-run was attributed to increase in scope of work, cement and diesel oil shortage, labour and power problems, changes in the sequence of work due to safety measures etc. As the delay was considered to be beyond the control of the contractor, extension of time was granted without levy of liquidated damages.

(iv) Delays in electrical work

The contract for the electrical work was awarded in July 1982 at an estimated cost of Rs.1.42 crores and was to be completed by January 1986. In April 1988 extension of time was allowed to the contractor till June 1988.

The work order for installation, testing and commissioning of 220 KV outdoor switchyard was placed at a cost of Rs.74.54 lakhs and was to be completed by August 1980. Certain items of work were added, extending the period of work to April 1982 and increase in cost to Rs.76.86 lakhs. The work was completed in September 1983. Reasons for the delay were not readily available.

(v) Delays in piping work

The contract for this work was awarded for Unit-I in August 1981 at an estimated cost of Rs.3.45 crores and for Unit-II in September 1982 at an estimated cost of Rs.2.74 crores. The work was to be completed in 48 and 40 months respectively. In April 1988, it was stated that only 97 *per cent* of the piping work for Unit-I and 70 *per cent* for Unit-II

had been completed due to various engineering changes received at the last moment.

The delay in the piping work was also due to the non-availability/non-release of terminal points as well as due to poor performance of the contractor. That the performance was below par had been brought out in the progress reports and NPB had also, in various meetings and discussions, pointed this out to the contractor urging him to come out with a definite plan of action. According to NPB the poor performance was due to the inadequacy of expert supervision, lack of skill, non-availability of manpower and tools at site and lack of planning.

(vi) Delays in Instrumentation

Instrumentation section is involved in various activities of all the systems, such as calibration and installation, laying of stainless steel tubes, swaglock fittings, tube welds, laying of copper and PVC tubes and conduits, brass compression fittings, soldering and screwing wire connection etc. The main action is in the shape of job work in different systems. In April 1988, it was stated about 60 *per cent* of the instrumentation work had been completed.

It was also observed that system-wise instrumentation work to be carried out and actual work done was not being maintained in the absence of which it may not be possible to properly monitor the work. It was explained that a large number of registers were being maintained where different works of each system have been recorded but no summary has been prepared to show system-wise balance quantity of work to be carried out. DAE stated in December 1988 that since a large number of sub-systems, instruments and devices are involved monitoring and prioritization was done in weekly meetings. It was also revealed that the slow progress of the work was due to non-availability of drawings, late supply of equipments and late release of work points to carry out the job work. While design drawings for the main process system have been received, design drawings for radiation monitoring system, reactor regulating system etc. were received in December 1988.

(vii) Delays in placement of purchase orders

There were also significant delays between raising of the indent and placement of the purchase orders by the Directorate of Purchase and Stores. A test-check of 39 purchase orders selected at random revealed that in 14 cases there were delays in the issue of purchase orders for periods ranging from 4 to 28 months. The consequent delays in the receipt of equipments ranged between 1 and 24 months. DAE stated that in 23 out of 39 cases orders were placed within 9 months and in 16 cases beyond 9 months. According to DAE an average of 6 months was required in finalising orders on foreign suppliers. In the case of indigenous suppliers also longer time was required because the capabilities of suppliers had to be adjudged especially when the equipments etc. were being developed for the first time. The reply did not clarify why in each of these cases the time taken was in excess of the normal time.

2.6 Cost over run

As against the revised (1982) project cost of Rs.399.64 crores, the expenditure upto March 1988 was Rs.487.36 crores. Another 13 *per cent* work remains to be done and there is a proposal (1985) to revise the total project cost to Rs.532.84 crores.

The cost over-run which was about 188 *per cent* or more on ten important major heads of expenditure are given below:

(In lakhs of Rupees)

Sl. No.	Major heads of expenditure	As per sanction of 1974	As per sanction of 1982	As per proposal of 1985	Total Increase (5-3)	Percentage of Increase [approx]
1.	Site and improvement	222.00	390.74	769.74	547.74	247
2.	Building and structures	1699.00	4141.19	4953.19	3254.19	192
3.	Reactor buildings and auxiliaries	3343.00	9874.47	13070.47	9727.47	291

(In lakhs of Rupees)

Sl. No.	Major heads of expenditure	As per sanction of 1974	As per sanction of 1982	As per proposal of 1985	Total Increase (5-3)	Percentage of Increase [approx]
4.	Instrumentation and control	860.00	2675.08	5506.08	4646.08	540
5.	Common process and services	1283.00	3224.96	3830.96	2547.96	199
6.	Construction plant	670.00	1702.95	2276.95	1606.95	240
7.	Housing and estate management	450.00	1201.38	1982.38	1532.38	341
8.	Field management and superintendence	450.00	656.00	1775.00	1325.00	294
9.	Customs duty	822.00	1645.30	2365.30	1543.30	188
10.	Heavy Water lease	300.00	600.00	928.00	628.00	209

DAE stated in December 1988 that since detailed designs of NAPP were not available, costs on the basis of MAPP was extrapolated. However, due to various design changes on account of seismicity, safety etc. the scope of work increased and alongwith it the cost. Thus, after stabilising the designs the cost was revised to Rs.399.64 crores in 1982. According to DAE, even this cost was not firm because the price of steam generators had not been finalised by then. Additional expenditure was also incurred on account of safety considerations.

The project had already proposed in 1985, revision of cost to Rs.532.84 crores on the premise that the project would reach criticality in 1988. This has not happened and the cost is likely to go up. The extent of revision 95 *per cent* in 1982 and 64 *per cent* in 1985 indicates that project was got approved on unrealistic cost estimates. Unrealistic cost estimates and optimistic time schedules make financial allocations and controls less meaningful.

2.7 *Monitoring*

The Performance Budget 1987-88 stated that there were slippages in the construction due to problems faced in the acquisition of land, delay in finalisation of designs, delay in fabrication of major equipments, technical problems encountered during construction and non-availability of construction materials. It was also seen that the annual performance was much below the anticipated levels and there was no significant improvement. The details are:

Year	Anticipated incremental target	Progressive total	Achieved incremental target	Progressive total	Estimated expenditure	Actual expenditure
		(in Percentage)			(In crores of Rupees)	
Upto 31-3-1981		(58)		(51)	139.97	
1981-82	12	(63)	7	(58)	45.33	41.64
1982-83	19	(77)	11	(69)	51.21	45.33
1983-84	15	(84)	3	(72)	51.21	47.87

Year	Anticipated incremental target	Progressive total	Achieved incremental target	Progressive total	Estimated expenditure	Actual expenditure
		(in Percentage)			(In crores of Rupees)	
1984-85	19	(91)	6.3	(78.3)	62.09	45.62
1985-86	15.7	(94)	4.7	(83)	45.00	45.81
1986-87	12	(95)	1	(84)	58.81	63.73
1987-88	12	(96)	3	(87)	49.00	60.91

Thus targetted level of completion for 1983-84 was reached in 1986-87 and only 87 *per cent* of the project had been reported as completed in 1987-88.

There was no dynamic monitoring of the project to keep down delays and costs. Facilities like heavy water upgradation building, waste management plant building and natural draught cooling towers had come into being at a cost of Rs.6.42 crores much before the main plant. These are tail-end facilities which could be put to use only after the start-up of the plant. As such these facilities are idle investments and the interest during construction only on these would work out to Rs.313 lakhs for 7 years.

Similarly, when the construction time required for the heavy water upgradation plant building was only 17 months and the work could have been awarded after the last steam generator was delivered, it was actually awarded in August 1982 i.e. at a time when even the first generator had not been delivered. Such early award of work without any dynamic recasting of schedule, based on other achievements in the critical path, resulted in the manufacturer/ contractor waiting to commence the work and finding these jobs unprofitable when they actually took up the jobs at a later date. Consequently, with loss of motivation the jobs got delayed with attendant cost over-runs. It was also difficult for DAE to plan for supply of free materials when such jobs were actually taken up at a later date resulting in avoidable payment of escalation costs.

2.8 Other topics of interest

(i) Poor Quality Surveillance before acceptance

In January 1985, NAPP placed an order for 1800 metres of Carbon Steel (CS) pipes on firm 'A' to be utilised in transporting liquid waste. Firm 'B' was awarded the work for laying the pipes Firm 'B' noticed that the CS pipes were deeply pitted and were of poor quality. Thereupon, firm 'A' agreed to do the mechanical cleaning of the pipes at their own cost. Accordingly, 713.36 metres of cleaned pipes and 1101.05 metres of new pipes supplied by firm 'A' were accepted. However, these-two lots were mixed and during the process of erection, it was noticed that the wall thickness of some of the pipes were less than the required specification. Consequently the entire lot of pipes were rejected and pipes erected at a cost of Rs.1.44 lakhs were dismantled. Subsequently, Stainless Steel pipes were substituted for CS pipes.

DAE stated in December 1988 that the pipes were visually examined for random lengths since manufacturer's certificate of quality was provided by the vendor. According to DAE only on destructive test, defects could be noticed. To an Audit observation that quality testing of pipes carrying liquid waste of a nuclear power project was not done, DAE stated that standard inspection procedure had been followed DAE also stated that dismantled CS pipes were utilised in other facilities.

(ii) Delay in erection of cranes

NAPP ordered for two 20 tonne cranes and two 30 tonne cranes to be supplied by April/May 1980. However, all the four cranes arrived at site by May 1981. The purchase orders had also provided for payment of erection charges of Rs.0.26 lakh and Rs.0.36 lakh per 20 tonne and per 30 tonne crane respectively provided the job was entrusted to the supplier within six months from the date of despatch. Only one 20 tonne crane and one 30 tonne crane could be erected in time. The other two cranes were erected in March 1983 after incurring an expenditure of Rs.0.90 lakh because the site for

erection was not ready. Together with Rs.0.06 lakh incurred on electrical components purchased as replacement, since the cranes remained in store for about two years, the total avoidable expenditure added upto Rs.0.34 lakh. Also Rs. 14.45 lakhs invested in the cranes had remained blocked for about two years. DAE stated in December 1988 that electrical components could have been spoiled because of monsoon but generally the project was providing adequate storage facilities. It was also stated that if the cranes had been procured two years later there could have been escalation in cost. This is hypothetical.

(iii) Blockage of capital in the purchase of Chiller Units

Out of two chiller units received at NAPP, in October 1984, only one has been commissioned. The second chiller, DAE stated, would be commissioned along with NAPP-II. Procurement of the chiller much ahead of requirement means blocking of Rs.21.64 lakhs for more than 4 years. DAE stated in December 1988 that long delivery items were to be procured in advance. However, the lead time was only 3 months and procurement 4 years ahead of requirement is not justified.

(iv) Non-utilisation of imported equipments

NAPP ordered (December 1981) one Fault Perturbograph including accessories at a cost of Rs.17.13 lakhs from abroad. Simultaneously an order for fabricating the panels for housing the equipment was also placed on the Indian agent of the firm at a cost of Rs.0.66 lakh with delivery by 31st March 1982. The equipment was airlifted in two lots in September/December 1983 at a cost of Rs.0.16 lakh. The foreign supplier was paid Rs.10.99 lakhs. DAE stated Rs.6.14 lakhs was paid as customs duty, insurance etc.

The panels for housing the equipment had not been supplied by March 1982. After repeated reminders, the drawings thereof were supplied in November 1984 and approved by DAE in February 1985. The panels were ultimately supplied in October 1986. The equipment remains to be installed as inter-panel wiring etc. are yet to be completed. DAE stated that the instrument had to be first imported before finalisation of drawings for panels, though the purchase order conditions were otherwise. DAE stated that the present cost of the equipment is Rs.30 lakhs which is fortituous. Even after excluding the time required for drawings etc. the equipment remains to be installed for more than 2 years which means Rs.17.79 lakhs is blocked.

(v) Irregular purchase of a Word Processor

Tender enquiry for acquiring a Word Processor with 160 KB Memory was issued in January 1984. Subsequently, the indentor pointed out that certain important firms had been omitted from enquiry and so the requirement was retendered and specifications were revised including that of memory to 128 KB. The second lowest offer at Rs.1.28 lakhs was accepted as it was for 128 KB. In this case also, the tenderer had originally quoted the equipment as possessing 64 KB memory but later informed NAPP that it should be read as 128 KB memory. The Word Processor was supplied, accepted and installed in June 1985 but it had only 64 KB memory. This was brought to the notice of the firm in November 1985 after the equipment had been put to use for a few months. The firm replied that it was not possible to upscale the memory to 128 KB. The DAE accepted the Word Processor with a price reduction of Rs.1,000 and informed the supplier that it was being done as a special case.

Acceptance of the Word Processor which was not in accordance with the specifications of the tender and release of the full payment even after the defective supply was noticed to accommodate the firm was irregular.

(vi) Premature procurement of electrical stores

The inspection of the Stores Division of NAPP conducted in December 1986 revealed that mechanical and electrical items valuing Rs.20.06 lakhs were lying idle for periods ranging from three to nine years. DAE stated in December 1988 that electrical items valued at Rs.13.01 lakhs would be utilised in NAPP-II. The balance stores was also needed for completion of the project. DAE's reply did not state the reasons for procurement of such stores 5 to 11 years ahead of requirement.

3. Heavy Water Plant, Baroda

3.1 Introduction

Heavy water is a compound of the heavier isotope of hydrogen, called deuterium and

oxygen (D_2O) and is needed in nuclear power generation. Heavy Water Plant, Baroda (BHWP) is linked with the fertiliser plant of Gujarat State Fertiliser Company Ltd., (GSFC) for supply of synthesis gas. This plant was the first plant to be established using ammonia water exchange process. A foreign technical collaboration agreement was entered into with M/s GELPRA in August/September 1969 to commission BHWP by January 1973. BHWP was however commissioned only in July 1977, closed and restarted in January 1980.

3.2 Scope of Audit

This review covers the performance of the BHWP during the period July 1977 to March 1988 and the major reasons for the delay in commissioning the plant.

3.3 Organisational set up

The heavy water plants are managed by Heavy Water Projects Board constituted by the Department of Atomic Energy (DAE). The heavy water manufactured and acquired are pooled and costed and leased to the individual nuclear power projects.

3.4 Highlights

- BHWP which was to be commissioned in January 1973 became operational only in July 1977 and actual production started only in November 1977. There was a delay of 53 months. It was shut down within 10 days of commissioning because of meachnical failures and explosion/fire. It was recommissioned in January 1980.

- Out of 53 months of delay in commissioning 22 months were accounted for by *force majeure* conditions in supplying equipments and 2 months of consequential delay in erecting. Another 5 months were lost due to equipment failures. 24 months were lost in commissioning.

- The initial financial sanction was for Rs. 1508.70 lakhs inclusive of foreign exchange component of Rs.762.20 lakhs. Due to slippage in schedule expenditure became Rs.3387.15 lakhs by June 1980 and in 5 out of 10 heads of expenditure the overrun was more than 50 *per cent.*

- Nineteen amendments were issued to the technical collaboration agreement and the financial liability of DAE increased by French Francs (FF) 38.41 lakhs and warranty periods of equipments etc. were reduced.

- Due to delay in commissioning, Rs.4.09 crores was additionally paid to the collaborator and Rs.2.71 crores was incurred on the establishment. Also commissioning expenses which were not provided for in the original estimates had to be provided for and this amounted to Rs.4.53 crores. Additional expenditure of Rs.1.38 crores was due to explosion and fire.

- The average annual production for the seven years 3 months upto 1987 was less than 30 *per cent* of the installed capacity. The best production was in 1985-86. The production in 1986-87 was about 39 *per cent.* The value of shortfall in production would be Rs.145.32 crores.

- The agreement with GSFC for ammonia synthesis gas did not specify the flow quantity of gas, deuterium content and mole percentage therein. Resultantly the production of heavy water was low. Rs.730.98 lakhs had been spent by March 1988 on remedial measures.

- Due to external and internal constraints which were not foreseen, there was poor production. The production capacity of the plant was derated.

- The cost of production was initially estimated as Rs.478 per kg. of heavy water. Later this was revised to Rs.1023 per kg. However, it was in excess of Rs.6886 per kg. in 1986-87. The cost of production has gone up also because of higher consumption of utilities. Average annual excess electricity consumption was 22,697 MWh

- The estimated loss of ammonia during heavy water production as guaranteed by GELPRA was 1 tonne per day. The actual loss was more than 10 tonnes and DAE has to bear the cost of loss of 6 tonnes per day.

- GSFC have claimed from DAE Rs.55.86 lakhs for loss of ammonia during the period of shut down.

- The incremental capital cost for scaling up ammonia production by 100 tonnes was Rs.538.72 lakhs. The additional capacity is shared equally but GSFC has not invested. Instead, GSFC is paying a fixed return only on the estimated share of investment of Rs.150 lakhs. Delayed payment of the fixed return upto 52 months meant loss of interest. Also delayed payments by GSFC for ammonia supplied meant loss of interest.

- The production of additional ammonia was less than the installed capacity and there were large variations in certain elements of cost of production of ammonia.

- Cost of loss of ammonia has been worked out as Rs.350.52 lakhs for the years 1976 to 1985 This has been claimed by GSFC from DAE. Rs.210 lakhs remains due from GSFC towards cost of DAE's share of ammonia supplied to GSFC.

- The excess payment to Oil and Natural Gas Commission on account of the difference between contractual supply of gas and actual consumption was Rs.309.20 lakhs for the period ending March 1985. DAE's share thereof amounted to Rs.113 lakhs.

- Consumption of water was less than the contracted supply. Test check revealed an excess payment of Rs.2.25 lakhs for 9 months.

3.5 *Import of know-how*

The Atomic Energy Commission (AEC) approved the setting up of the plant in July 1969. Accordingly, a technical collaboration agreement was entered into with GELPRA, a French consortium for a turn-key project in August/ September 1969 with the plant scheduled to be commissioned by January, 1973. Various guarantees and warranties were provided regarding machinery, utilities to be consumed, production levels, etc. Initially, GELPRA wanted to adopt hydrogen distillation process in the finishing unit but in March 1970 they suggested ammonia hydrogen exchange process. This was agreed to in November 1970 since saving in the consumption of electricity, simpler equipments and lesser maintenance/spares cost were anticipated. There were 18 other amendments to the contract and some of the notable ones are listed below:

S.No.	Original contract	Revised provision	Remarks
(i)	No provision for standby spares	Provision for standby spares - FF 11.08 lakhs	DAE stated standby spares were procured considering the longer lead time and also to ensure against future non-availability. Also cost of two years spares, originally agreed upon was increased from FF 9.07 lakhs to FF 9.40 lakhs.
(ii)	Cost of Indian supply of equipment and material FF 111.88 lakhs (approx.)	Revised cost - FF 110.72 lakhs (Approx.)	No remarks.
(iii)	Supervision cost of erection and mechanical tests FF 20.00 lakhs	Revised to FF 47.00 lakhs	No remarks
(iv)	FOB delivery of equipment machinery due and spare-parts was to commence from (21st month) May 1971 and to be completed by end of October 1971.	FOB delivery of equipment/machinery to commence from October 1971 and to end on 27th August 1973	DAE stated that the delivery was delayed due to force majeure conditions.
(v)	Mechanical warranty was for 12 months from the date of achievement of equilibrium in production, viz. upto 1975. In case of delay for reasons beyond the control of GELPRA mechanical warranty was for 28 months from the date of shipment of last equipment.	In case of delay erection or commissioning for reasons beyond the control of GELPRA, Mechanical warranty will expire by 31st March 1975.	DAE stated 28 months would have expired in November 1975 since the last shipment was in August 1973. Since erection and mechanical testing was completed in April 1975 the revision was entered into This does not seem correct since the original provisions were upto 1975 and there was 22 months delay on the part of GELPRA. The warranty should have been got extended upto 1977. Further, GELPRA's performance guarantee was upto 5 months after mechanical testing i.e. till September 1975. This was also reduced to March 1975.
(vi)	GELPRA was to ensure minimum production capacity of 95 *per cent* of guaranteed production.	Guaranteed production capacity was 93 *per cent.*	No comments.

Due to these various amendments, the liability of the DAE increased by FF 38.41 lakhs excluding increased cost on indigenous supply. The scope of foreign supply was also increased by FF 67.71 lakhs from out of the Indian portion of FF 110.72 lakhs. Further, BHWP was commissioned in July 1977 after a delay of about 53 months. However, GELPRA was absolved of all technical guarantees etc. by an amending agreement entered into in November 1978 after outbreak of fire in the plant in December 1977. The actual production commenced in November 1977, but BHWP had to be shut down due to explosion and fire. It was restarted in January 1980. The de facto delay was therefore about 83 months.

DAE stated in December 1988 that scope of foreign imports expanded since indigenous manufacturers quoted long delivery periods or shied away from tendering due to stringent specifications. As regards 53 months delay, DAE stated that 22 months were due to force majeure conditions in supplying exchange towers and two months in the consequential delay in erecting it. DAE admitted that after mechanical completion, 5 months were lost due to equipment failures and 24 months in replacing, modifying and installing problem equipments like canned motor pumps, catalyst separation column and exchange towers of finishing units. DAE added that GELPRA was absolved of plant performance obligations because contractual quantities of feed gas could not be ensured. DAE did not explain why GELPRA was absolved of equipment warranty even though various equipment failures were noticed during mechanical testing phase and thereafter. DAE had mentioned that continued stay of GELPRA experts to prove the plant would have been at a cost. But the need for extended stay of experts arose because of explosion in the plant, delay due to force majeure conditions, failure of equipments etc. as admitted by DAE. Being so, GELPRA experts should have been asked to stay at their own cost to prove the plant.

3.6 Delays

(i) Delays in civil works

As per the schedule drawn by GELPRA, the civil works were to be completed by 31st January 1972; but the work relating to foundations for plant and equipments and sub-station were 'technically' completed in April 1974 and January 1974 i.e. after a delay of 27 and 24 months respectively although these were 'functionally' completed in time. This was stated to be due to number of agencies working simultaneously at site.

(ii) Delay in structural steel work

The contract awarded in April 1971 at an estimated value of Rs. 33.06 lakhs was to be completed by December 1971. However, the work was completed in August 1974 after a delay of 32 months. The delay was stated to be due to revising the layout for piping for better operation. This resulted in revised fabrication drawings and increase in scope of work. The quantity of steel to be fabricated increased from 1355 tonnes to 1577 tonnes.

(iii) Delay in equipment erection and piping

The work was awarded in April 1972 with date of completion as January 1973 together with a grace period of five months. The work was completed in October 1974. The delay was about 16 months and was attributed to belated shipment of towers by GELPRA and subsequent changes in the layout plan for piping.

(iv) Delay in delivery of Tower 12 T1

As per the original contract, GELPRA were scheduled to complete supply of Tower 12 T1 by October 1971. However, it was shipped only in August 1973. The delay of 22 months was attributed to strike in the fabrication shop in France.

(v) Delay in erection and mechanical testing

DAE was to inform the contractor about the commencement of the erection approximately two months in advance. Erection and mechanical testing was to be completed in ten months by October 1972. The erection actually lasted 32 months from September 1972 to April 1975. The delay of 22 months was stated to be on account of belated supplies of equipment, modifications in various sections for better operation, stringent specifications for chemical cleaning of piping, leak testing etc.

(vi) Delay in commissioning

After the plant was erected, failures in the pistons of the synthesis gas compressor, failures in high pressure SDT valves etc. were noticed.

Resultantly, commissioning started in May 1975 instead of January 1973. In addition, commissioning itself took 26 months instead of 2½ months due to mechanical failures of rotors of pumps in exchange Tower T_1, leakages in the valves, repeated choking in the sieve trays, pumps etc. limitations in the catalyst separation column and absence of provision for removal of heat in the exchange reactor. DAE stated that the plant was the first of its kind set up in the country and involved operations at high pressure. Hence problems encountered could not be visualised earlier.

(vii) Delays due to explosion

The plant became operational in July 1977 but could not be sustained beyond 10 days due to leakages in ammonia condensor and strike in GSFC. The plant was restarted in November 1977, but one of the ammonium injection blocks failed causing explosion and fire. The plant was shut down in December 1977 and was re-commissioned after 24 months in January 1980. The extra expenditure due to explosion was Rs.138.42 lakhs. DAE stated that additional expenditure was incurred to replace indigenous equipments and towards cost of transportation and customs duty on free replacements made by GELPRA in respect of high pressure equipments.

3.7 Cost Over runs

The initial financial sanction issued in June 1970 was for Rs.1508.70 lakhs with foreign exchange component of Rs.762.20 lakhs. Due to slippage in the schedule, the cost estimates were revised twice- in July 1975 to Rs.2010 lakhs with foreign exchange component of Rs.1135 lakhs and in September 1979 to Rs.3417 lakhs with foreign exchange component of Rs.1553 lakhs. This is exclusive of capital cost of spares of Rs.250 lakhs which had been deducted from capital account. DAE stated that the total project expenditure was Rs.3387.15 lakhs and has adopted Rs.5552.07 lakhs as total capital cost including Interest During Construction (IDC). The variation in capital expenditure with reference to the original estimate was Rs.1878.45 lakhs.

An analysis indicated additional expenditure of more than 50 *per cent* in 5 out of the 10 sanctioned heads. The details are given below:

Sl. No.	Item	Original cost estimate	Revised cost estimate as per 2nd rivision	Difference (+)Increase (-)Decrease	Expenditure incurred	Reasons for increase in original cost estimates
			(Rs. in lakhs)			
(i)	Establishment and office contingencies	68.30	305.00	(+)236.70	334.96	Time over-run of four years.
(ii)	Machinery and equipment and material (including insurance, freight and customs)	919.90	1590.00	(+)670.10	1401.76	(i) Enlarged import, escalation in prices and variations in exchange rate (+)273.68 (ii) Transportation of Tower 12 T1 in single piece not originally envisaged. (+)35.11) (iii) Customs duty (+)109.27

Sl. No.	Item	Original cost estimate	Revised cost estimate as per 2nd rivision	Difference (+)Increase (-)Decrease	Expenditure incurred	Reasons for increase in original cost estimates
			(Rs. in lakhs)			
						(iv) Inland transportation (+)39.03 (v) Spares imported and indigenous) (+)318.07 (vi) Additional freight (+) 6.00 (vii) Additional equipments by foreign supplier. (-)111.06
(iii)	Plant contingency	73.00	218.00	(+)145.00	229.38	Delay in completion of the plant.
(iv)	Supervision of erection and commissioning	60.00	479.00	(+)419.00	468.92	Delay in completion, escalation in *per diem* rates for GELPRA personnel.
(v)	Plant commission		456.00	(+)456.00	432.77	Excessive time taken.
	Total	1121.20	3048.00	(+)1926.80	2867.79	

The commissioning period provided in the agreement was 2½ months and supervision charges provided were Rs.60 lakhs. Since the period of commissioning was extended to 26 months, additional payment of Rs.408.92 lakhs had to be made to GELPRA. Similarly, the original estimate did not provide for any plant commissioning expenses presumably because commissioning was to take place in a short period and the expenses were expected to be marginal. However, since the period of commissioning was extended and the actual consumption of raw materials and utilities such as water, boiled feed water, electricity, lubricant, etc. was on a high scale, expenditure of Rs.432.77 lakhs had to be separately booked and capitalised. Spares for Rs.318.07 lakhs were also purchased in addition to the spares already supplied under the technical collaboration agreement.

DAE stated that the cost over run was due to additional imports from GELPRA in lieu of indigenous supply (Rs.1.80 crores), variations in exchange rate, customs duty, etc. (Rs.2.91 crores), additional spares (Rs.4.67 crores), additional payments to GELPRA due to extended stay etc. (Rs.4.09 crores), commissioning expenses (Rs.4.33 crores), additional expenditure on Indian establishment due to delay (Rs.2.71 crores) and revamping (Rs.1.38 crores). The decapitalising of spares brought down the capital expenditure by Rs.2.50 crores. According to DAE, cost over run was inevitable because this was the first plant which was being established in the country and many of the problems could not be foreseen. Also the additional spares had to be acquired as insurance spares.

3.8 Discharge of bank guarantees even when the technical guarantees were not fulfilled

GELPRA had furnished bank guarantees aggregating to FF 61.24 lakhs which were renewed from time to time for fulfilment of the important technical guarantees like hourly production of heavy water of nuclear quality consumption of electricity being pegged at 6796 Kwh/hour for production of heavy water at rated capacity the total loss of synthesis gas in heavy water plant being not higher than one tonne per day, etc.

After the fire/explosion in December 1977, a settlement was reached by DAE with GELPRA and an amending agreement was entered into in November 1978 to discharge the bank guarantees even though the technical guarantees were not fulfilled. DAE stated that technical guarantees could not be fulfilled because supply of synthesis gas etc. was below the stipulated quantity and quality and the operation of BHWP was totally dependent upon the operation of GSFC plant. DAE also stated that there were differences in opinion between GELPRA and DAE regarding the causes of explosion. Since the continued stay of GELPRA experts would have meant additional cost and since by then DAE was confident of commissioning BHWP with their own experts, GELPRA was absolved after they agreed to cooperate in the assessment of damage, listing of corrective actions, free supply of equipment valued at FF 4 million, etc. As already stated, the technical agreement did not provide that if the GELPRA experts were to extend their stay because of their failures they would underwrite the cost of stay. In sum, the experts were repatriated despite mechanical and production failures and explosion in the plant and before BHWP was proved.

3.9 Performance of BHWP

According to DAE's own report, BHWP faced problems right from the erection stage and there were delays in the supply of fabricated equipments, design defects, leakages, failures of pumps, explosion etc. The problems encountered were typical of a new technology and step by step advance was made towards better performance.

BHWP has produced less than 30 *per cent* of the installed capacity of heavy water on an average, in a period of 7 years 3 months ending in March 1987. The best production was in 1985-86 and the production came down in 1986-87 when it was about 39 *per cent*. Figures of production for 1987-88 were not available. The value of shortfall in production amounted to Rs.145.32 crores calculated at the rate indicated by DAE.

The reasons for low production have been analysed by DAE in 1982-83 as lower quality and lower flow of feed gas, lesser recovery of deuterium in BHWP, other mechanical factors, shut down of the plant, loss, etc.

The poor production of this plant was also the subject of comment of the Estimates Committee (1983-84). In their 82nd Report (7th Lok Sabha) the Committee observed "The Committee find that the Heavy Water Plant at Tuticorin and Baroda have not been working at full capacity because of technical problems. The Committee are of the firm view that when the demand for heavy water to support the nuclear energy programme has picked up so fast, we cannot afford the existing water plants to languish".

Subsequently the BHWP analysed the reasons for the shortfall and submitted a report making some recommendations. It was estimated that the implementation of the recommendations would cost Rs.235 lakhs and it was also noted that the maximum achieveable capacity of BHWP would only be 66.66 *per cent* of the rated capacity even after modifications. The proposals to implement the modifications and derate the capacity of BHWP were approved by the AEC in June 1985. DAE stated that irrespective of the production capacity, the achieveable capacity was reassessed mainly on (a) external constraints such as lower deuterium content and lower percentage of hydrogen in the feed synthesis from GSFC and (b) internal constraints such as attainable stream factor of the plant. DAE did not clarify why these were not foreseen at the time of project evaluation.

In March 1985, the Government had sanctioned Rs.330.11 lakhs for installation of hyper compressor. By March 1988, DAE had incurred Rs.730.98 lakhs. The Government had sanctioned Rs.567.46 lakhs in December 1987. DAE stated in December 1988 that remedial measures have been put through except the one relating to improvement in deuterium content of the synthesis gas because of space constraints in GSFC.

The performance of the plant was also poor on account of heavy power consumption. As against the norms for power consumption per kg. of heavy water, the excess consumption of power varied between 21,000 and 25,000 MWH

during 1981-82 to 1986-87.

DAE stated that higher consumption was due to several additional equipments outside the GELPRA proposals. It was also stated that calculating consumption as per norms may not be correct because BHWP is not operating at full capacity. However, for 24.30 *per cent* production in 1981-82, the consumption was 36,336 MWH and it was 36,887 MWH in 1984-85 for 27.69 *per cent* production. The electricity consumption was very high in 1986-87 when compared with 1985-86 when the production was the best. These are indicative of the variance in electricity consumption and how far higher consumption increased the cost of production.

3.10 Cost of production

BHWP has not prepared the proforma accounts and hence the loss of production is not easily ascertainable. DAE had stated in March 1988 that the cost of production of heavy water had not been worked out prior to the year 1985-86 and for the year 1987-88. DAE further stated in December 1988 that since the heavy water is for captive use BHWP has not been declared as a commercial undertaking. Even if it is for captive use the management ought to know the cost of production. It is therefore necessary that the financial results of the plant are expressed in the normal commercial form so that the cost of the service may be accurately known.

The Department did not produce to Audit either the actual production of heavy water or the cost of production. However, Audit has worked out the cost on the basis of reliable records available with GSFC. The cost of production of heavy water worked out to Rs.5308 per kg. for the year 1985-86 and Rs.6886 per kg. for the year 1986-87.

These figures are markedly higher than the original estimated (1969) cost of production of heavy water of Rs.478.40 per kg. as compared with the then market price of imported heavy water of Rs.470 per kg. (excluding customs duty and freight). At the time of revising the project cost (July 1979), the cost of production was worked as Rs.1023 per kg. against the then imported cost of Rs.2835 per kg. (CIF). The cost of production achieved in BHWP is high as compared to the estimates due to increased investment, higher consumption of materials and utilities and low capacity utilisation.

According to DAE, the cost of utilities and inputs had gone up. Besides the increase in investments which were stated to be beyond the control of the project were also responsible for increase in the cost of production. The cost of production would even be higher than Rs.6886 per kg. in 1986-87 because by March 1988 the project had incurred additional capital expenditure of Rs.7.31 crores on hyper compressor. A complete list of capital expenditure subsequent to closure of capital account is not available. Further lowering the project cost has reduced depreciation cost, return on investment and maintenance cost which are calculated as a percentage of capital cost in the accounts of DAE. In the case of maintenance and spares, actual expenditure is not being booked and only a notional expenditure of 4 *per cent* of capital cost is booked.

3.11 Arrangements for ammonia supply

Since the sustained production levels of ammonia in GSFC was not adequate to match the rated capacity of BHWP, DAE decided to set up an ammonia plant of 50 tonnes/day at its cost. Subsequently, at the request of GSFC, DAE decided to increase the capacity of the ammonia plant to 100 tonnes per day. The incremental cost of the ammonia plant was estimated to be Rs.150 lakhs. GSFC was not willing to finance the incremental cost but agreed to pay a fixed annual payment of 14 *per cent* on Rs.150 lakhs i.e. Rs.21 lakhs per annum. Finally when the augmentation facility for ammonia was put through the total investment on it worked out to Rs.538.72 lakhs. The calculation of fixed return only on Rs.150 lakhs is incorrect as the actual investment has gone up.

As per the agreement with GSFC the loss of ammonia to be borne by DAE has been calculated as 1 tonne per day. However, in a meeting held in August 1984, GSFC pointed out that they were unable to account for 20 to 25 tonnes of ammonia out of which 10 tonnes per day should be borne by BHWP. However, GSFC was willing to reduce their claim for loss of ammonia to 5 tonnes per day including one tonne per day already agreed upon. A further meeting was held in December 1984 and BHWP agreed to bear the cost of loss of ammonia for 5 tonnes per day over and above the loss of one tonne per day subject to approval by DAE. On the basis of this, GSFC has claimed Rs.350.52 lakhs for loss of ammonia for the year 1976 to 1985 excluding 1978-79. The proposal remains to be approved by DAE (January 1988). DAE however stated that loss of ammonia cannot be accurately measured for various reasons.

GSFC has also claimed compensation for the loss of ammonia of 1805 tonnes and 3124 tonnes suffered by them during the period April 1979 and January 1981 respectively due to shut down of their plant to facilitate BHWP to carry out their repair jobs. DAE have agreed to bear 50 *per cent* (2460 tonnes) of the loss at a cost of Rs.55.86 lakhs. DAE stated that this was necessitated because gas leakages were noticed in 1979 and an enquiry was initiated. Subsequently, in 1980, all the tapping points were got checked which necessitated GSFC keeping one or the other ammonia plant shut down.

The performance of the new ammonia plant set up to augment production of ammonia is as under:

Year	Productin of ammonia in tonnes (approx.)	Cost of production (Rs. per tonne)
1976	10,063	722.65
1977	26,217	631.36
1978	16,144	856.64
1979	18,530	935.77
1980	18,995	1004.11
1981	21,825	1036.33
1982	25,115	1152.10
1983	24,940	1367.00
1984	32,536	1150.81
1985	36,693	1374.12

The actual production was much less than the installed capacity of 30,000 tonnes except in 1984-85. Originally, the 100 tonnes/day ammonia plant was installed to augment the supply of ammonia from GSFC and sustain steady levels of supply of ammonia. This was not achieved. DAE stated that the production of ammonia was determined by the requirement of downstream plants and since all the plants are inter-connected it was not material whether the new ammonia plant produced to capacity or not. DAE's reply indicates that the facility was set up prematurely. As regards, increasing cost of production, DAE stated that it was because of increasing cost of inputs.

However comparison of some elements of the cost of production revealed that there was much variation in the expenses as shown below:

Item of expenses	1982	1983	1984	1985
	(Rupees in lakhs)			
(a) Repairs and maintenance	2.36	1.39	4.28	76.98
(b) Steam	5.83	6.56	5.14	13.21
(c) Inert gas	0.47	0.46	0.38	0.05
(d) Stores and spares	9.47	32.07	28.75	35.64

DAE stated that sporadic increases in maintenance cost of an ammonia plant was inevitable and was dependent upon production and operation of the plant. The expenditure in 1985 was high due to complete change of catalyst tubes and overhauling.

In the above cost of production, GSFC have included financing charges for spares amounting to Rs.7.80 lakhs for 1982 to 1985 and this is outside the scope of the agreement. As per the agreement, DAE was only to pay towards cost of raw materials, steam, utilities, inert gas, other inputs and operation and maintenance. DAE stated that the matter was under correspondence.

3.12 Other points of interest

(i) Delay in payment of fixed charges

GSFC had agreed (July 1973) to make annual payment of Rs.21 lakhs towards interest on the incremental capital cost incurred by DAE for increasing ammonia production. The payment is to be made within 30 days of the end of each year. There were delays ranging from 4 to 52 months in making these payments uptill the year 1984 and payment has not been made for the year 1985 and 1986 (March 1987). DAE stated as per discussions in December 1984 GSFC have paid the charges upto 1986.

(ii) Delay in payment of dues for ammonia

According to the agreement GSFC was to make the payment for the DAE ammonia within 10 days of every quarter on ad hoc basis. Final adjustment is to be made within 30 days of the end of each year. GSFC had not made the payment from 1982 onwards amounting to Rs.210.06 lakhs upto 1985 since GSFC avers

that the loss of ammonia in the plant was higher. Orders of DAE for bearing of the cost of additional loss of 5 tonnes/day agreed to by the BHWP remains to be issued. Rs.210.06 lakhs are due from GSFC for the years 1982 to 1985 even after adjusting the cost of additional loss of ammonia. This non-payment also meant substantial loss of interest to government. DAE stated that the matter was under consideration.

(iii) Extra expenditure on natural gas

Oil and Natural Gas Commission (ONGC) supplies natural gas to BHWP under an agreement. According to the agreement ONGC was to charge for the actual quantity drawn tlll June 1975, for 45,000 SM3 (minimum) to 2,50,000 (maximum) cubic metres for the period July 1975 to November 1975 and for 1,35,000 SM3 (minimum) to 1,40,000 (maximum) cubic metres for the period December 1975 to December 1981. The actual gas consumption was always below the minimum contracted quantity since BHWP performance was not upto the installed capacity. The extra expenditure was Rs.309.20 lakhs for the period August 1975 to November 1977 and February 1980 to March 1985 on unutilised gas. DAE stated its share of additional expenditure was only Rs.113 lakhs as the rest was payable by GSFC.

The agreement expired in December 1981 and had not been renewed thereafter. DAE could have re-calculated the requirements of natural gas and paid according to consumption at least for the period 1981-1985. DAE stated that elongation of the commissioning period to 26 months, explosion and shutting down of BHWP and poor production of ammonia due to downstream constraints could not be anticipated. DAE did not elaborate as to why mid-course correction could not be attempted particularly when there was an explosion and plant shut down. As regards renewal of agreement, it was stated to be under discussion.

The gas supplied by ONGC was being shared between ammonia plant and the heavy water plant in the ratio of 2:1. The cost of natural gas for the ammonia plant was to be borne by GSFC. No formal agreement had been entered into with GSFC in this regard. It was also noticed that the ammonia plant had consumed more than 2/3rd, in some months, but the DAE had claimed only 2/3rd cost of the gas. When the error was noticed, a supplementary claim for Rs.19.45 lakhs was raised in September 1986 and remained to be settled. DAE stated that no agreement with GSFC was necessary. This is not in harmony with the need for agreements with GSFC for other supplies and services.

(iv) Extra expenditure on account of water

An agreement with Baroda Municipal Corporation (August 1974) provided that the minimum water consumption is 0.5 million gallons per day and the maximum demand per month would be 30 million gallons. The actual consumption of water was much below the minimum and the extra expenditure for the period April 1985 to January 1986 was Rs. 2.25 lakhs.

DAE stated that water metres were faulty which have been replaced in August 1987 whereafter the consumption is more than the minimum. It was also stated that for operational flexibility the contract demand for water should be more than the minimum. Since the consumption of water is dependent upon the production demands and since the plant had operated at very low capacities upto 1984-85, the demand of 0.5 mgd from 1974 and upto 30 mgd was exaggerated irrespective of the fact that water metres were faulty.

4. Extra expenditure on insurance

In August 1984, Department of Atomic Energy (DAE) entered into an agreement with Rashtriya Chemicals and Fertilizers Limited (RCF) for construction, commissioning, operation and maintenance of Heavy Water Plant (HWP) at Thal Vaishat for which RCF shall be paid a lumpsum fee of Rs.3 crores towards service charges in addition to funds required for executting the project. The deemed date of agreement was February 1982. The sanctioned project cost for the Heavy Water Plant was Rs.187.65 crores including foreign exchange component of Rs.63.55 crores. The project was completed in March 1987 at a cost of Rs.160 crores. The project cost estimates sanctioned by Government included insurance charges only for imported equipments. However, RCF had taken (August 1982) an insurance policy for all risks covering transit-cum-storage-cum-erection-cum-commissioning in respect of imported and indigenous material/machinery/ equipments for Heavy Water Project for Rs. 163.09 crores.

DAE intimated in May 1984 to RCF that as per Government decision, insurance was allowed for ocean transportation of imported equipments only. DAE, therefore, requested RCF to

take open policy only for transportation of imported items and make declarations as and when consignments were shipped to enable the insurance company to issue policies alongwith the premium bills for settlement. In view of this, the DAE's contention (August 1988) that the obligations cast on RCF in the matter of construction, commissioning etc. had apparently made RCF to take out a comprehensive insurance policy in respect of HWP in the same way as for their Thal Fertilizer Project and it was necessary to safeguard the Government's property in the custody of RCF is not acceptable.

Further, as per Exercise of Financial Powers (DAE) Rules 1978, the DAE is competent to incur expenditure on transit insurance in respect of only imported equipment, materials and other items. Accordingly, the premium of Rs. 19.68 lakhs towards transit insurance for imports included in the total premium payment of Rs.99.20 lakhs under the combined comprehensive insurance policy was only admissible. The Insurance Company intimated (February 1985) that if a separate insurance cover only for imported material was taken by HWP, they would require to pay additional premium of Rs.15.96 lakhs towards transport insurance of imported material. Thus, if the insurance cover had been restricted to cover only transit risks of imported items DAE would have paid only Rs.35.64 lakhs.

Since RCF had paid the premium under the comprehensive policy taken both for imported and indigenous equipments, it presented DAE with a *falt accompli* and DAE accorded (June 1986) ex-post-facto approval for an expenditure of Rs.99.20 lakhs being the HWP's share of premium for comprehensive combined insurance policy. The non-restriction of insurance cover as per rules or project estimates resulted in extra expenditure of Rs.63.56 lakhs.

5. Overpayment made to transport contractors

The Directorate of Purchase and Stores (DPS), Department of Atomic Energy (DAE), appointed 'A' as transport contractor in January 1983 for transportation of iron and steel materials. The contract provided one rate for transportation, unloading and stacking of material and another rate for loading, transportation, unloading and stacking. It was confirmed from Steel Authority of India Limited (SAIL) in February 1986 that suppliers like SAIL do not allow outsiders into their stock yards and the entire loading operation of steel into a lorry is carried out by their own gangmen. The stock-yard price of steel as distinct from ex-factory price included the element of cost for loading and DAE was not to pay for loading DAE had paid the higher rate inclusive of loading charges which resulted in an over-payment of Rs.1.86 lakhs during 1983 to 1987 on the basis of minimum difference of Rs.9.00 per tonne for the year 1983 to 1984 and Rs.15.00 per tonne for the year 1985 to 1987.

Another contractor 'B' who had not been paid any loading charges for transportation of steel during 1983 to December 1985 also demanded loading charges, on the analogy of other contractors being given this rate, while quoting the rates for the years 1986 and 1987. DPS agreed to pay the loading charges and the overpayment made to the contractor 'B' during January 1986 to December 1987 amounted to Rs.1.47 lakhs.

DAE stated in November 1987/August 1988 that the suppliers of steel only arranged for delivery of the material upto the lorry through a crane and did not stack the materials into the lorry. According to DAE, the contractor had to engage his own driver and cleaner for the purpose of loading the material into the lorry. DAE therefore contended that the rate paid towards loading was reasonable. The reply is not acceptable because it was a running contract since 1977, and the overall rates of the contractors would have taken into consideration all incidental expenses. Also SAIL had clarified in February 1986 that loading included loading into the lorry. The operation of loading into the lorry by SAIL gangmen was also witnessed by the Department officials. Thereafter, the Department itself had written to one of the transport operators regarding the inadmissibility of loading charges. Further, it was obvious from the fact that contractor 'B' had not demanded separate charges for loading till January 1986 and demanded it only when he learnt that other contractors had been so paid. Thus there was an overpayment of Rs.3.33 lakhs on the above transport contracts.

DEPARTMENT OF ELECTRONICS

6. Poor progress of project clutter measurement and modelling

The Department of Electronics (DOE) sanctioned in June 1979 a project on 'Clutter Measurement

and Modelling' with a total outlay of Rs.96.52 lakhs with foreign exchange component of Rs.57.59 lakhs as grant-in-aid to be undertaken by the Indian Institute of Technology (IIT), Kanpur.

The objectives of the project were to design and fabricate a mobile experimental system for the measurement of land clutter, obtain models oriented towards better target detection and measure typical land clutter returns and obtain their models. The project was to be completed by June 1983 and accordingly the DOE released Rs.64 lakhs in 1979-80 to the IIT.

Out of Rs.64 lakhs so released, the IIT, had spent Rs.58.39 lakhs by March 1985 and had incurred only Rs.0.54 lakh in 1985-86 and Rs.0.47 lakh in 1986-87. In addition, Rs.3.29 lakhs for Crystal Oscillator and Synthesizer and Rs.8 lakhs on PDP level computer remained to be paid (September 1987).

The project could not be completed in time and the delay was attributed to failure of equipment, delay in obtaining spare parts, loss of microwave cables and difficulties in fabrication of the mobile unit. On a representation by the IIT, the DOE approved in June 1983 to grant two years extension of time. The IIT, intimated in March 1985 that the project was facing serious shortage of manpower and could not be completed.

It was noted by the Project Review and Steering Group (PRSG) of the DOE (May 1985) that installation, integration and checks of the equipment and system had not been done due to non-availability of microwave scientists/ engineers. Though efforts were made to recruit scientists from the open market/Ministry of Defence, etc., no effort was made to get microwave scientists from the Society for Applied Microwave Electronics Engineering and Research (SAMEER), an autonomous body functioning under the DOE. Ultimately, the right type of scientists were located in SAMEER in December 1987/January 1988. Four scientists were stated to have joined from SAMEER till May 1988. Thus, it had taken 2 years and 9 months to get microwave engineers through another organisation of the DOE itself.

The DOE stated in October 1987 that the Monitoring Group had not met between February 1983 and May 1985 as not much headway towards progress of the project could be expected. Thereafter also, the PRSG did not meet till October 1987. Further, six monthly progress reports were not received and audited statements of accounts for 1985-86 and 1986-87 were received in September 1987 after it was pointed out by Audit.

It was also reported in October 1987 that out of the equipment procured, some of the components of the equipment will have to be repaired/replaced.

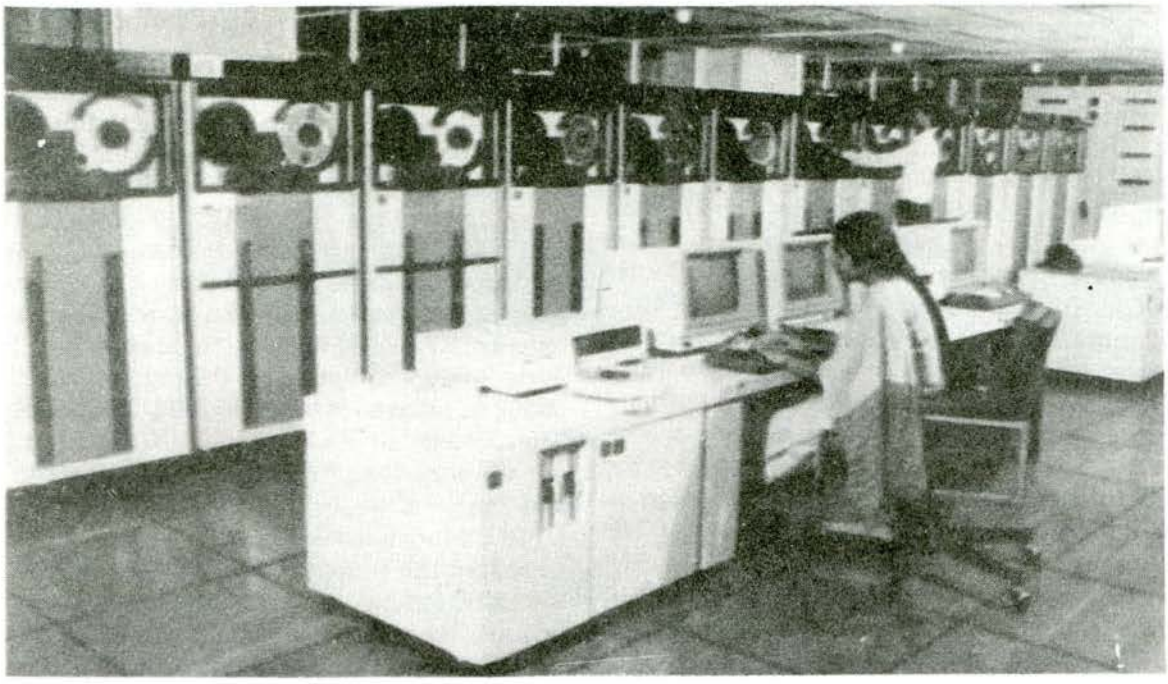
DOE stated in June 1988 that based on the actual availability of manpower from January 1988, the project has now been targetted for completion by June 1990. It was also admitted that IIT, Kanpur had been experiencing problems in executing the project due to failure of certain components and fabrication of mobile structure etc, as also manpower shortage from 1983 onwards. It has also been claimed by DOE that research and development done as part of this project would still be valid.

In sum, monitoring of the project was inadequate both in terms of frequency and quality leading to a delay of 5 years and another 2 years are still required to complete the project. Given the pace of change of technology in electronics, it remains to be seen whether the project would ultimately be useful and translated into a ground reality.

7. Non-installation of an imported computer system

The National Informatics Centre (NIC), till recently under the Department of Electronics (and now under Planning Commission), decided to establish a National Informatics Computer Network (NICNET) to provide computer based decision support information system. In April 1986, NIC decided to install an ND-550 computer system in Calcutta in order to extend the NICNET, facility to West Bengal. State Government of West Bengal was addressed in the matter in May 1986 and was requested to provide 5000 sq.ft. of accommodation nearest to the Secretariat alongwith necessary infrastructural facilities. Normally, a Memorandum of Understanding (MOU) is signed with the State Government before the NICNET facility is established. In this case, MOU was signed only in March 1988 'after a lot of persuasion'. The above MOU stipulated that State Government of West Bengal should provide 4000 sq. ft. of space in the heart of the city with uninterrupted power supply.

Before finalisation of the accommodation facilities for NICNET, NIC had ordered for the import of the computer from Norway at a cost of Rs.49.00 lakhs and it was expected to be delivered in July 1986. The computer system



was initially received in New Delhi by the Electronics Commission in September 1986 and it was airlifted to Calcutta in November 1986. Out of the 8 packages airlifted 2 package were found damaged on receipt. The matter is stated to have been taken up with the clearing agent.

Further, NIC had hired 3100 sq.ft. of accommodation with effect from June 1986 on a monthly rent of Rs.9600 from a private party for storing the computer system. Since no suitable accommodation near the Secretariat could be found, it was decided to install the computer in the accommodation where it was stored. Accordingly, the Central Public Works Department (CPWD) floated tender enquiries in February 1987 for preparing the site. However, in February 1987 itself, CPWD was asked to stop the work since a central location was still desired and accordingly, Government of India and Estate Manager, Calcutta were addressed in March 1987. Ultimately, when no suitable accommodation could be located till July 1987 and because some of the computer parts were catching rust due to humidity, in July 1987, it was decided to install the computer on a temporary basis in the space where it was stored. It was however not installed till June 1988.

NIC stated (June 1988) that due to various reasons the estimate of the site preparation cost could not be arrived at by the CPWD till February 1987 though action in this matter was initiated as early as April 1986. The contention of the NIC is not tenable because CPWD was asked to discontinue the site preparation work in February 1987 when tenders for the work had been floated. Further, even in April 1987 the NIC was hoping to obtain government/private accommodation in a central area. The ultimate decision to temporarily installed the computer in its present location was taken only in July 1987 after it was reported that some of the computer parts were getting rusted. NIC also stated that 3100 sq.ft. of hired accommodation was not only for ND-550 installation but was also for NIC State Centre which is already functioning. This is also incorrect since apart from 3100 sq.ft. in the 2nd floor of the NCE building hired for storing ND-550 system, NIC had also hired 3300 sq.ft. of accommodation in the third floor of the same building from where the office is functioning. In fact, Director General, NIC is reported to have agreed, in principle, for hiring accommodation of 10,000 - 12,000 sq. ft. in April 1987.

Thus, NIC had prematurely imported the computer system before finalising the accommodation facilities and signing the MOU because NIC should have realised the difficulties of locating 4000 sq.ft. of accommodation in a central area, in a Metropolitan city like Calcutta. Consequently, the computer imported at a cost of Rs.49.00 lakhs has not been installed so far (June 1988). In addition, there was an avoidable rental expenditure of Rs.2.40 lakhs on storage of computer upto June 1988.

8. Non-utilisation of grants-in-aid by Electronics Test and Development Centre, Srinagar

Department of Electronics (DOE) sanctioned under Standardisation, Testing and Quality Control Programme, Rs.32.30 lakhs as grants-in-aid during November 1978 to March 1982 for the purchase of capital equipments to the Electronics Test and Development Centre (ETDC), Srinagar which was set up in 1977 by Jammu & Kashmir Government with the objective of improving the quality and reliability of indigenously manufactured consumer electronics. Six monthly progress-cum-achievement reports were required to be sent by the ETDC to the DOE under the terms of the grant. Further grants were not to be released unless such reports were received regularly.

ETDC procured capital equipments worth Rs.31.51 lakhs out of the grant but could not put these into use since there was limited technical staff exclusively for the ETDC. In April/May 1987, equipment worth Rs.17.10 lakhs were transferred from ETDC to the Centre for Electronics Design and Technology (CEDT), Srinagar, whose main objective was to conduct post-graduate diploma course in electronics.

The DOE stated in July 1987 that the transfer to CEDT was made without their knowledge. Further, in February 1987 when the CEDT prepared a list of equipments to be procured, it did not take into account the equipments already transferred from the ETDC. DOE stated (May 1988) that the equipments transferred were quite old and their life was not certain. It was also admitted that there could be problems about their repair and maintenance. The plea of the Department that the equipment transferred were taken into consideration before placing order for new equipment is also not correct. It was also stated (February and May 1988) that some progress reports were received, although not very regularly and the State Government had not shown keen interest in the development of the ETDC and so further grants to the ETDC were stopped. Thus, substantial grants-in-aid of Rs.32.30 lakhs for purchasing capital equipments by the ETDC, Srinagar was given without ascertaining the availability of the required technical staff and possibility of proper utilisation.

9. Non-accountal and diversion of grants-in-aid

Electronics Test and Development Centre (ETDC), Chandigarh, a unit functioning under Chandigarh Industrial and General Development Corporation (CIGDC) had received grant-in-aid to the extent of Rs.19.02 lakhs from the Department of Electronics (DOE) for the purchase of indigenous equipments/machinery during March 1975 to January 1980. In January 1983, the DOE decided to amalgamate ETDC, Chandigarh with the ETDC, Mohali (Punjab) and take it under their administrative control. All the equipments purchased by ETDC, Chandigarh out of the grants-in-aid were to be handed over to ETDC, Mohali on amalgamation. However, only equipments valued at Rs.15.64 lakhs were handed over by ETDC, Chandigarh. The balance of Rs.3.38 lakhs had neither been got refunded nor otherwise accounted for. It was only after being pointed out in Audit, ETDC, Mohali asked CIGDC, in January, 1988, to refund the amount to DOE.

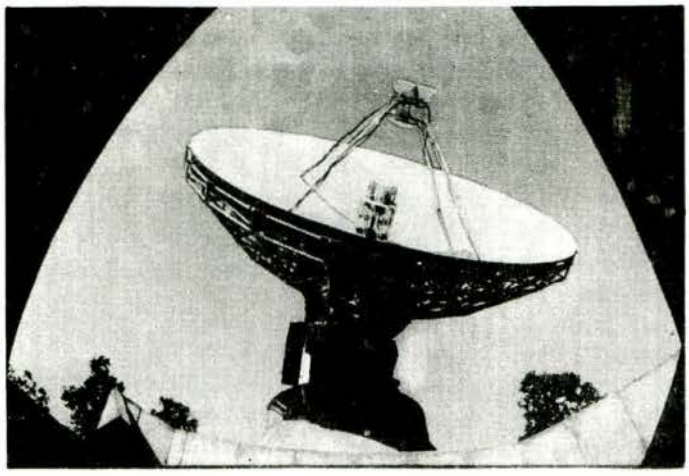
DOE stated in June 1988 that CIGDC had utilised the funds towards pay and allowances and as such DOE was yet to get refund of the balance amount from the CIGDC. The DOE admitted that such diversion of funds by CIGDC was irregular and the matter was being taken up with the Chandigarh Administration.

The case revealed that the DOE had not monitored the utilisation of grant for the last 8 years which resulted in non-accountal and diversion of the grant.

10. Incomplete Technology Development

The Department of Electronics (DOE) sanctioned Rs.35 lakhs in February 1978 for developing and supplying an engineered version of Omega Upsonde System for use in Monsoon Experiment (MONEX) Directorate of India Meteorology Department (IMD). Out of Rs.35 lakhs, Rs.18 lakhs was sanctioned for developmental work and Rs.17 lakhs was for delivery of an operational system. Subsequently, in November 1978, the cost of the project was enhanced by Rs.2.35 lakhs to facilitate procurement of additional components critically needed for developing the system. The project was to be completed in two years though IMD wanted the system to be delivered by March 1979 so as to fit in with the time-table of MONEX.

Space Application Centre (SAC) delivered the developmental model of the system by November 1978 and the sea trials conducted in December 1978 indicated the need for several modifications. These were attempted but the system could not be fully developed before March 1979. 190 Omega sonde flights con-



ducted during May - August 1979 also indicated the system to be technologically inadequate. SAC decided to take back the system in September 1979 and deliver a fully re-engineered version. It was also decided to complete the development of the system though MONEX would have been concluded before the operational system was delivered. The non-availability of the engineered version did not affect MONEX.

By November 1980 the engineered development model became ready. It was decided that sea trials of the model should be conducted and decision regarding fabrication of operational system would be taken by the monitoring group after getting the feed back. By March 1981, SAC had spent Rs.36.38 lakhs out of the total sanction of Rs.37.35 lakhs and enhancement of the project cost by Rs.7.65 lakhs was demanded. Both the working group and monitoring group decided that enhancement could be considered only if the project was accorded 'priority' by SAC and the project was completed within six to nine months. In January 1982, the monitoring group for the project recorded that SAC was willing to develop the operational system of the equipment but did not want to undertake productionising of sondes. SAC was willing to pass on the know-how to any other production agency. SAC also did not agree to conduct acceptance trials on-shore prior to trials off-shore. IMD, however, insisted on conducting the evaluation trials on-shore before off-shore trials. They also wanted 250 sondes to be supplied alongwith identification of productionising agency if SAC was not willing to productionise the sondes. The issue was not resolved. The sea trials of the operational system was also delayed till February 1985 for want of ship.

The possibility of using SAC design was pursued till July 1986 and a committee was constituted for this purpose since Army also had interest in a system similar to that developed by SAC. However, the system with certain updatements made thereon, did not meet with the specification of the Army. DOE also stated in June 1988 that the requirement of IMD could not be indigenously productionised being small sized demand.

The case revealed that DOE was funding research and development as well as supply. IMD, the user, had no pecuniary interest in the contract to help out indigenisation since resources were being released by DOE, in advance. Since the system to be developed had limited use, it should have been met through imports, especially in the context of stringent time limits and production specifications. Thus the development of omega sonde system remains incomplete for the last 9 years despite an expenditure of Rs.36.38 lakhs.

MINISTRY OF ENERGY
DEPARTMENT OF NON-CONVENTIONAL ENERGY SOURCES

11. Failure to insure transit risks of imported equipments

The Department of Non-Conventional Energy Sources (DNES) decided to set up a Solar Thermal Power Plant of 50 KW. One of the equipments required for the plant was line focussing solar collectors. The purchase order for supply of solar collectors and related equipments of f.o.b. basis was placed in May 1986 with a foreign firm for DM 24.13 lakhs. The

installation, commissioning and testing of the equipment was to be completed within one year from the date of opening of letter of credit on 22nd September 1986. The consignment of equipments was received in 3 batches in September 1987. The consignment, on inspection, was found damaged and 74 out of 108 absorber tubes inside the consignment were found to be broken. The cost of broken absorber tubes amounted to Rs.23.04 lakhs (DM 2.95 lakhs). The Surveyor's report for the damage was obtained in February 1988 at a cost of Rs.0.18 lakhs. No marine insurance had been taken to cover transit risks though Law Ministry had advised the DNES in October 1986 to provide for such insurance cover from the date of despatch of equipment to the date of its installation. Subsequently, DNES had to order for 72 absorber tubes as replacements for the broken tubes and these were delivered in February 1988. The difference of 2 absorber tubes was to be met out of 12 spares available out of the original 108 tubes.

In their reply, the DNES stated in September 1988 that Government instructions normally discourages insurance of Government cargo. While admitting that there were discretionary enabling provisions for insurance of cargo in special circumstances, these could not be applied as the supplier did not indicate which of the consignments contained non-fragile and which of the consignments contained frgile items.

The DNES further stated in December 1988 that only outer glass cover of the absorber tubes have been broken and the supplier has accepted the responsibility for the damage. Since the DNES already has with it some money payable to the supplier, DNES stated that it would adjust the cost of damage and no net additional expenditure would accrue to the DNES.

Since DNES had contended that the extant instructions on insurance are discretionary and normally discouraging, Government should consider issue of specific instructions so that expensive research equipments, components and stores are not transited without adequate cover. Issue of such instructions would obviate possible loss of foreign exchange and enable all scientific departments to follow uniform practice.

MINISTRY OF ENVIRONMENT AND FORESTS

DEPARTMENT OF ENVIRONMENT, FORESTS AND WILDLIFE

12. Lack of timely administrative action leading to blockage of funds

The Central Government undertakes training of the Indian Forest Service Officers at the Indira Gandhi National Forest Academy, Dehradun on their initial appointment. During the period, the emoluments and allowances of the officers are paid by the Academy and is reimbursable by the State Governments after the probationers are allocated to the State cadres. Debits are raised every year by the Academy against the State Governments concerned.

At the end of March 1987, Rs.1.49 crores remained to be recovered from various State Governments. The matter was taken up in Audit in July 1987. In August 1988 the Ministry of Environment and Forests stated that the matter has been pursued with the concerned State Governments and an amount of Rs.57 lakhs has been recovered since, leaving an outstanding amount of Rs.92 lakhs against the State Governments concerned. The Ministry was pursuing with the States for early reimbursement of outstanding dues.

Further, the IFS Probationers are required to execute agreement bonds for successful completion of their probation. In case of their failing to complete the probation, they are required to refund on demand any money paid to them including pay and allowances etc. It was noticed that a total of Rs.6.73 lakhs (March 1987) was yet to be recovered in such cases of non-completion of probation. Some of these cases date back to 1968-69. The Academy stated that the matter regarding waiver of recovery for non-completion of probation due to probationer's joining other services has been referred to Central Government and a decision was still awaited.

Thus, due to lack of timely administrative action, a sum of Rs.98.73 lakhs remains blocked.

DEPARTMENT OF OCEAN DEVELOPMENT

13. Acquisition of a research vessel

The Department of Ocean Development (DOD) took delivery of a research vessel 'Sagar Sampada' from a foreign yard in December 1984 for the purpose of fisheries and oceanographic research. The research vessel was to be used for "trawling" and "long-lining" in addition to other functions for ocean research. However, it was found during operations that the vessel was suitable only for trawling and not for long-lining, as the requisite deck layout for this purpose was not provided for. A Japanese expert who had been working with Central Institute of Fisheries Nautical and Engineering Training opined in 1985 that the difference in height between sea level and the long-line hauler, absence of free space at the stern of the vessel for paying out long-lining etc., made the vessel unfit for long-lining. According to him, the cost involved in providing necessary modifications for long-lining would be prohibitive.

Further, the ship building contract provided that for a period of 12 months from the date of delivery the builder shall guarantee remedying of defects concerning the vessel free of charge at builder's shipyard. It was noticed in March 1985 that trawl winches of the vessel were not of required capacity and DOD took up the matter with the builder within the guarantee period. The builder accepted the defects and sent an engineer from the firm which had actually manufactured the winches. The engineer worked from 2nd to 13th May 1985 but in the after-trial-cruise, the performance again fell short of specifications. The Central Marine Fisheries Research Institute (CMFRI) who were operating the vessel intimated that the pulling capacity being much below the optimum requirement, it was quite unsafe to use bottom trawl nets in deep water. The CMFRI suggested replacement with higher capacity winch system. The yard desired that the winch pull should be tested by dynamometer before the claim was accepted. The test was done by Cochin Shipyard Limited in November 1985 and the pull-capacity was found to be much below the specified capacity of 15 tonnes.

In August 1985, DOD decided to replace the winches with higher capacity pull of 35 tonnes. Accordingly the Shipping Corporation of India (SCI) was asked to explore the possibility and send their recommendation. The SCI after consulting the firm informed DOD in March 1986 that the firm had agreed to take back the old winches and spare motor at a total cost of DKR 3.60 lakhs (Rs.4.90 lakhs) subject to the condi-

tion that the cost of transportation of the winches to Denmark would be borne by DOD. It was also stated that the cost of new winches of 35 tonne pull, including ancillary expenses after taking into account the above credit would work out to DKR 20.60 lakhs (Rs.28 lakhs). Accordingly, the Department sanctioned a sum of Rs.40.10 lakhs in March 1986 for securing replacement of the winches. The work of installation and replacement of winches was completed in March 1987 at an additional cost of DKR 20.21 lakhs which included DKR 10.50 lakhs as cost of new winches, DKR 4.48 lakhs as cost of accessories and DKR 5.23 lakhs as service charges and air-fare for the technicians.

It was seen that as against the cost of DKR 3 lakhs for each of the old winches, credit of only DKR 3.60 lakhs was given for the two old winches, and one spare motor. Thus a loss of DKR 2.40 lakhs (Rs.3.24 lakhs) was incurred and was not made good by the supplier though the winches were not according to specifications. Also service charges and air-fare for the technicians amounting to DKR 5.23 lakhs (Rs.7.05 lakhs) were incurred. The costs should have been borne by the builder under the agreement. Also the accessories of the old winches have been rendered useless with the installation of a winch of higher capacity.

DOD stated in December 1988 that tuna fishing was not one of the objectives of the research vessel. However, the audit point is about the long-lining, which is one of the objectives of the acquisition of the vessel. Secondly, DOD have contended that the defect in winch was due to accidental handling. It was seen that CMFRI wrote to the Department in June 1985 that the Guarantee Engineer who had come from abroad and tested the winches had explained that the rated capacity of the winch was low and could not be improved. DOD's minutes of the meeting held in August 1985 does not mention of any defective handling or accident. As already stated the winches were tested with dynamometer and the CMFRI wrote to DOD in December 1985 that as per discussions with the builder's representatives, the claim will have to be accepted by the builders.

Thus, a vessel which could not undertake long-lining for ocean research had been accepted rendering it of limited use to the Department. Additionally, a loss in excess of DKR 7.63 lakhs (Rs.10.29 lakhs) was incurred due to supply of lower capacity winches and their replacement at an additional cost.

14. Excess release of grants without monitoring the requirements

Department of Ocean Development (DOD) sanctions grants to the National Institute of Oceanography (NIO), Goa, a constituent unit of Council of Scientific and Industrial Research for conducting research programmes. During 1984-1987, Rs.631 lakhs had been released to NIO despite large unspent balances available with them as shown below:

Year	Amount of grants released during the year	Amount released in March	Unspent amount at the close of the year
	(Rupees in lakhs)		
1984-85	159.00	71.50	80.87
1985-86	229.00	95.10	208.33
1986-87	243.00	158.22	290.87
	631.00		

The progressive growth of unspent balance was due to release of grants without proper assessment of the immediate requirements of NIO and monitoring of the unspent balance. The unspent amount was kept with a bank in current account.

The General Financial Rules stipulate that "the sanctioning authority shall see that money is not drawn in advance of requirements" and also "a rush for payment of these grants in the month of March should be avoided". However, this was not observed.

According to DOD, the unspent balance with NIO had come down to Rs.69.80 lakhs as on 23 March 1988 and they have since streamlined the procedure keeping in view the observation of Audit.

DEPARTMENT OF BIO-TECHNOLOGY

15. Excess release of funds leading to blockage

The Department of Bio-technology (DBT) (earlier National Board of Bio-technology) of the Ministry of Science and Technology approved

in February 1986, the establishment of the National Animal Tissue Culture Facility (NATCF) on the campus of the University of Pune. The Ministry also provided Plan funds of Rs. 377.50 lakhs in the Seventh Five Year Plan. The grant was to be released through the Indian Council of Medical Research (ICMR) since the facility was to be under the administrative control of ICMR.

Out of the above Plan outlay, Rs.107.39 lakhs was released by ICMR to NATCF on 31st March 1986. Out of the above grant, only Rs.22.30 lakhs could be spent in 1986-87 and Rs.18.77 lakhs upto December 1987 on salaries, contingencies, furniture, library books, etc. However, the Management Committee consisting of representatives from DBT, ICMR, NATCF etc. had met in August 1987 and approved an allocation of Rs.87.95 lakhs for the year 1987-88. The balance of Rs.66.32 lakhs remained unutilised even after a period of 22 months. The inability to spend substantial amount of the grant indicated unplanned release of funds.

In April 1986, Rs.105 lakhs was invested in fixed deposit for one year with a nationalised bank and Rs.8.27 lakhs had been earned as interest and it was credited to Government account only in June 1988 at the instance of Audit. The cash balance with the NATCF on 31 December 1987 was Rs.75.64 lakhs.

NATCF stated in June 1988 that there was delay in the allotment of land by the University of Pune for NATCF and delay in signing the Memorandum of Understanding between the University and DBT. As the Memorandum was signed only in February 1987, release of Rs. 107.39 lakhs as early as March 1986 amounted to injudicious cash management resulting in avoidable budgetary deficits to Government of India. It also resulted in diversion of funds as funds were invested with banks. Release of such huge sums unmatched by requirements could also mean denial of funds to organisations and departments which could have used them for developmental purposes during April 1986 to December 1987. DBT stated in December 1988 that NATCF has been restructured and the Financial rules are now being properly observed.

INDIA METEOROLOGY DEPARTMENT

16. Delay in installation of computer

India Meteorology Department (IMD), New Delhi placed an indent in November 1982 on the Directorate of Supplies and Disposals (DSD), Madras for purchase of TDC-316 and DBP-100 computer system together with technical services and installation thereof. Accordingly, in April 1983, the DSD, Madras placed two 'Acceptance of Tenders' (A/Ts) on Electronic Corporation of India Limited (ECIL), Hyderabad for Rs.18.13 lakhs and Rs.8.25 lakhs for supply of computer and for providing technical services respectively.

The computer was originally planned for installation in New Delhi for the purpose of implementation of Sixth Five Year Plan scheme on "Improvement and modernisation of flood meteorological organisation". In April 1983, the IMD through an amendment to indent and without ascertaining the availability of accommodation, informed its Regional Centre in Calcutta (Centre) that the computer system would be installed in Calcutta centre. According to the specifications, a floor area of 100 sq.mt. was needed for installation of the system and the Central Public Works Department (CPWD) was approached in November 1983 to carry out the civil, electrical and airconditioning work required for the purpose. The Director General of Meteorology, New Delhi accorded in April 1984 expenditure sanction to the preliminary estimate of Rs.10.61 lakhs framed by the CPWD for the work.

The equipment had, however, reached the Centre at Calcutta in June 1983 in 21 crates, of which 4 crates partially and 3 crates badly were damaged. The extent of damage was examined in a joint inspection conducted by the ECIL and insurance company in July 1983 and ECIL had undertaken the responsibility of replacing the damaged parts at the time of commissioning the computer. According to the terms of the contract, a sum of Rs.22.65 lakhs was paid to the ECIL against the two A/Ts. Rs.0.07 lakh had been spent on storage insurance for the computers in September 1987.

The Regional Meteorological Centre, Calcutta intimated the CPWD about the vacation of the room meant for installation of computer in March 1985 only. While the civil work had been executed, the electrical and airconditioning works, the essential pre-requisites, were still (April 1988) to be completed. The electrical installation work awarded to a contractor by the CPWD has also not been completed. Another contractor, to whom the airconditioning work was entrusted in June 1985 left the work half done and CPWD was considering (April 1988) to make alternative arrange-

ments for completion of the work. Thus, the computer system, the warranty period of which had long expired, was lying without being installed (June 1988).

Ministry of Science and Technology stated in June 1988 that accommodation was available throughout for taking up the work by the CPWD. This is not correct and only in March 1985 CPWD was asked to take up site preparation work with adequate space when the room was vacated. The computer has not been installed even after 5 years.

Thus, lack of proper interfacing between the acquisition of the computers and getting ready the infrastructural facilities not only caused non-fulfilment of objectives but also resulted in blockage of funds to the tune of Rs.22.65 lakhs for 5 years.

17. Defective contract leading to blockage of capital and infructuous expenditure

(a) The Directorate General, Supplies and Disposal (DGS&D) on behalf of the India Meteorology Department (IMD), contracted in July 1980 for import of five facsimile recorders EMR-816/02 Model) from USA for receiving cloud pictures transmitted by the satellites for arriving at day-to-day weather forecasts. These were to cost US $ 1,70,870 (Rs.13.67 lakhs) excluding customs duty. The supplier firm, subsequent to the placement of the order requested that the model of facsimile recorder be changed to Muirhead M-300 RH without any change in price. The IMD accepted (February 1981) the change for technical reasons and recorded there may not be any significant cost differential. The difference in price paid for five units was only Rs.8,336.

Two of these recorders were installed at New Delhi and one each at Vishakhapatnam, Madras and Bombay in 1982/1983. However, the recorders developed problems after operating for about 6 months and are lying idle since then. When approached for spares, the supplier informed in October 1984 that the manufacture of the Muirhead model had been discontinued and no spares were available in stock. However, Clause 14(1) of the agreement provided for supply of spare parts for eight years from the date of agreement, on mutually agreed terms and under Clause 14(2), the supplier was bound to inform the IMD of its intention to discontinue the model at least 12 months before such discontinuance and was bound to provide alternative sources of supply for life time spares on mutually agreed terms. The supplier failed to inform the IMD about the discontinuance of the model and supply of spares and consequently, the IMD could not obtain any relief as the agreement was defective and did not provide for any penalty for failure to supply spares etc.

The supplier suggested (October 1984) that the system could be modified to wet process recording from dry silver process at an extra cost of US $ 50,000 for each recorder. The IMD stated in September 1988 that it has been decided not to go in for a modified system because of the high cost and efforts are still on to get the spares through the prime contractor. It was also stated that alternative arrangements for recording have been made at these five stations, which have partially achieved the objectives. However, the five imported facsimile recorders continue to remain idle for the last five years.

(b) The IMD had also imported dry silver paper for the five units as under:

Sl.	Date of purchase	Quantity (in rolls)	Cost per roll (in $)	Date of Issue Expiry	Year of Issue (in rolls)	Balance
1.	April 1982	151	223	February 1983 11	1982	140
2.	May 1983	64	223	May 1984 12	1983	192
3.	November 1983	72	223	October 1984 3	1984	261
4.	December 1986	70	260	February 1987 5	1985	326

The annual consumption varied from 3 rolls to 12 rolls, but the stock in hand increased from 140 rolls to 326 rolls. The IMD continued the import of dry silver paper even though only 20 *per cent* of the initial purchase made in 1982 had been consumed by December 1986 and the shelf life was limited as indicated in the table above. The cost of 326 rolls held in stock was Rs.9.70 lakhs including customs duty of Rs.3.49 lakhs. Thus, the idle investment on dry silver paper and defective equipment amounted to Rs.23.37 lakhs.

SURVEY OF INDIA

18. Procurement of wrong paper resulting in blockage of funds

The Controller of Stationery, Government of India, Calcutta placed a purchase order on a paper mill on 26th August 1985 for supply of 882 reams of cream wove paper of super calender size at a cost of Rs.3.75 lakhs. The supply was to be made to Survey of India, New Delhi as early as possible but not later than 31st December 1985. On receipt of the copy of the purchase order, Survey of India, on 8th October 1985, requested the Controller of Stationery to cancel the order as the paper indented for was Map Litho paper and different from the one indicated in the purchase order.

No action was taken and the mill supplied 807 reams of paper in July 1986. Survey of India sought clarification from the Controller of Stationery in August 1986 and also requested the Director, Survey (Air), New Delhi that the paper may not be used till receipt of a clarification. Rs.3.60 lakhs being 98 *per cent* cost of the paper supplied was paid by the Controller of Accounts, Department of Supply, Madras and debit was accepted by the Regional Pay & Accounts Officer, Survey of India, Jaipur in August 1986. Survey of India again wrote to Controller of Stationery in December 1986 regarding non-acceptability of the paper and suggested that the mill be instructed to refund Rs.3.60 lakhs. The paper was not taken back by the mill.

In March 1987, 150 reams of paper were issued and thereafter there had been no issue. The value of balance quantity of paper lying in stock as on 5th July 1988 was Rs.2.93 lakhs. The mill on whom the purchase order was placed was also not one of the mills recommended by the indentor. Ministry of Science and Technology stated in September 1988 that though the paper was not suitable for printing of maps due to waviness, misregistration and distortion, it was again tested on the machines and found suitable for map printing, as the paper got seasoned during storage itself. Though the entire stock is now stated to be issued the facts reveal that unsuitable paper not indented for was supplied and accepted. The Controller of Stationery did not take action to prevent supply of unsuitable paper for a period of eight months.

DEPARTMENT OF SPACE

19. Injudicious purchase of ammonia dissociator

Vikram Sarabhai Space Centre (VSSC), Department of Space (DOS), raised an indent in March 1981 for procurement of an ammonia dissociator at an estimated cost of Rs.85,000 for the sintering furnace for a development programme approved earlier. The equipment was to provide assured supply of hydrogen gas essential to sinter the nickel plaques.

As the equipment was urgently required, limited tenders were invited. The approval was obtained for the purchase of the equipment alongwith a drying unit at a cost of Rs.1.95 lakhs. The purchase order was issued in July 1981 and the equipment was received in VSSC in September 1981. By then, Rs.2.15 lakhs had been paid which included transportation charges also. The equipment was inspected and accepted in November 1981.

Despite urgency in the procurement of the equipment, it was not installed till December 1985 due to lack of sufficient and safe working space. Even after commissioning it has not been put into operation so far as the availability of hydrogen gas had improved in the meantime. VSSC stated (March 1988) that by the time the ammonia dissociator was received in VSSC, the supply position of hydrogen gas had improved rendering the equipment superfluous. It was also stated that ammonia gas was more expensive than hydrogen to attempt production of hydrogen from ammonia with ammonia dissociator.

In sum, no benefit has accrued to VSSC on the investment of Rs.2.15 lakhs in the last about 7 years and according to DOS the dissociator is kept as a standby (September 1988).

20. Additional expenditure due to faulty design

Sriharikota Range (SHAR) Centre, placed an order in September 1984 on Southern Structu-

rals Limited, a company of the Government of Tamil Nadu, for fabrication, transportation and installation of a dome structure consisting of shutters and wind screen for housing the infra-red astronomy telescope. SHAR took this work on agency basis for a Physical Research Laboratory station at Mount Abu. The total purchase order was for Rs.15 lakhs. The design drawings for the dome were to be provided by SHAR while the company was to prepare the fabrication drawings. Fabrication of the sub-systems was to be taken up only after fabrication drawings were approved by SHAR.

The company fabricated and installed the dome by December 1986. But the wind screen did not function as required and needed replacement. The company contended that the complete design of the wind screen system was given by SHAR and fabrication of the wind screen system was carried out with the approval of SHAR. The fault was due to use of mild steel for fabrication while the design was based on aluminium. The use of heavier material in fabrication was approved by SHAR but ultimately the guide system etc. did not work because of heavier metal used.

SHAR constituted a Technical Committee which opined in April 1987 that the wind screen shutter was in the nature of industrial rolling shutters and recommended modification of the wind screen shutter. Even before the Technical Committee forwarded its suggestion in April 1987, the company was addressed by SHAR in March 1987 for a new and guaranteed wind screen system. The firm replied in May 1987 that they would design and fabricate a guaranteed wind screen at a cost of Rs.2.05 lakhs, but insisted upon full payment of Rs.2.20 lakhs due against the original order as a precondition. An amendment to the purchase order was issued in July 1987 for a new wind screen system using aluminium as the metal. It remained to be completed till November 1988. DOS stated (November 1988) that the dome has been installed but the wind screen was not expected to be commissioned and proved before December 1988. DOS also stated that the release of balance payment to the company would be decided after the wind screen was commissioned. Thus DOS had to incur an additional expenditure of Rs.2.05 lakhs due to its initial faulty design.

21. Avoidable expenditure on security arrangements

Central Industrial Security Force (CISF) has been inducted at Sriharikota Range Centre (SHAR), Department of Space (DOS), for protection of the vital installations. The strength of CISF is jointly decided by CISF, DOS and Intelligence Bureau. The strength of CISF in February 1988 was 374 and Rs.413.37 lakhs have been spent on CISF during the period 1981-82 to 1987-88.

Despite this large contingent of CISF, a platoon of Andhra Pradesh Special Armed Police (APSAP) consisting of 38 members was also engaged since March 1981 and the expenditure thereon was reimbursed to the State Government. According to DOS (September 1987), APSAP had been inducted to augment the CISF since operations at SHAR are highly sensitive. CISF can only perform watch and ward duties, the small police outpost functioning in Sriharikota was inadequate to meet any serious law and order situation at SHAR and the district Headquarters at Nellore was at a considerable distance. Further, the need for continuing APSAP was being periodically reviewed and the last review was held in August 1987 and it was found necessary to continue the deployment of APSAP.

The Department's reply was not convincing. Law and order is a state subject and the police outpost at Sriharikota should have been got upgraded, if necessary, with the help of the State Government. Further, with the amendment of CISF Act, CISF has been declared an armed force of the Union with effect from 15th June 1983 with powers to arrest without warrant when necessary. Moreover, APSAP and CISF have similar roles with one being a State force and the other of Central Government. Also the addition of a platoon of APSAP with 38 persons when 374 CISF personnel are available is of marginal value. Thus, the continued engagement of APSAP was objected to by Audit. In November 1988 the DOS stated that the position had been reviewed and in the light of further developments, the APSAP need not continue. Thus the continuation of APSAP since 1981 had resulted in avoidable expenditure of Rs.41.09 lakhs till March 1988.

22. Administrative lapse in suitably investing Provident Fund deductions

Indian Space Research Organisation (ISRO) was initially created as an autonomous body under the Department of Atomic Energy and was charged with the responsibilities relating to space technology. With the creation of Department of Space (DOS) in 1972, ISRO became a

unit of the DOS, with effect from April 1975. Consequently the Provident Fund (PF) account of the employees of ISRO hither-to maintained by Physical Research Laboratory, another autonomous body, was transferred with effect from April 1975.

A separate audited statement of the PF Account upto 1974-75 was received by Physical Research Laboratory from DOS in September 1984. It was then found that there was a difference of Rs.2.48 lakhs between the total amount due to the PF subscribers and the amount in deposit because of non-investment of the PF deductions in approved securities. PF deductions had been retained in savings bank account or invested in State/Central Government securities which earned much less interest than the interest payable to PF subscribers at the rates notified by the Government from time to time. In order to make up the deficit, DOS sanctioned Rs.2.48 lakhs in October 1986.

The failure to invest the funds in approved securities resulted in the avoidable expenditure of Rs.2.48 lakhs.

23. Unrealistic assessment of power needs

Sriharikota Range Centre (SHAR), Department of Space (DOS) entered into a five year contract with Andhra Pradesh State Electricity Board (APSEB) in January 1979 for supply of a maximum load of 6000 Kilo Volt Amperes (KVA) High Tension electricity. The contract *inter alia* stipulated that during the contract period, SHAR would not effect any change in the maximum demand or contracted load and the terms and conditions relating to supply would be as notified by APSEB from time to time under Section 49 of the Electricity (Supply) Act, 1948. The charges were to be paid on the maximum demand during a month or 80 *per cent* of the contracted demand i.e. 4800 KVA whichever was higher.

A review of power consumption during October 1980 to March 1988, however, revealed that SHAR had consumed much less power than the contracted demand. The highest consumption at any point of time was 3680 KVA and highest average monthly consumption was 3176 KVA.

DOS stated (August 1988) that for technical reasons it was necessary to establish power supply through 132 KV line since voltage fluctuations and interruptions were too many with 33 KV line. This in turn necessitated agreeing to a maximum demand higher than 5000 KVA and therefore DOS opted for 6000 KVA.

However, it was actually due to DOS preferring a demand of above 5000 KVA that led to the establishment of 132 KV line. The interruptions and drop in voltage were more due to system instability and lower power generation.

Even after the commencement of Polar Satellite Launch Vehicle (PSLV) related activities in 1986-87, SHAR could utilise a maximum of 3680 KVA only which was 61.30 per cent of the contracted demand. In fact, in June 1988, SHAR had written to APSEB that they could restrict their demand to 5 MVA to accommodate power cuts. Thus the estimated needs for power as made out in 1979 was unrealistic and SHAR failed to reassess their needs and reduce the demand through a fresh agreement in 1984 resulting in avoidable payment of Rs.56.72 lakhs during October 1980 to March 1988. SHAR also paid Rs.0.24 lakh for delayed payment of dues in June 1982 and May 1985.

Even if DOS contention of the need for 132 KV line and a contract demand in excess of 5 MVA is accepted, it is seen that the contract demand could have been restricted to more than 5 MVA under the tariff notification of APSEB and DOS would have saved Rs.18.97 lakhs during the period October 1980 to March 1988.

24. Ammonium perchlorate plant

In May 1975, Department of Space (DOS) decided to set up an Ammonium Perchlorate Plant of 150 tonnes capacity and procured the necessary technology from Central Electro Chemicals Research Institute (CECRI) on payment of Rs.0.25 lakh.

The estimated capital cost of the project in 1975 was Rs.84.38 lakhs which included land (Rs.6.50 lakhs), civil and electrical works (Rs.32.94 lakhs) etc. The cost of production was anticipated to be Rs.15.35 per kg. as against the market price of Rs.15.15 per kg.

The plant was to be commissioned in 24 months but was commissioned after 44 months in February 1979. DOS stated in March 1986 that the delay was due to failure of anodes, corrosion of cooling coils, low current efficiency, problems of product caking etc.

The capital expenditure on the project was Rs.95.92 lakhs till March 1979. This included Rs.17.97 lakhs for land, Rs.40.81 lakhs for

civil and electrical works, Rs.32.08 lakhs for equipment and Rs.5.06 lakhs for chemicals etc. during commissioning. Subsequently, during the years 1979-80 to 1985-86, a number of sanctions were issued for civil works (Rs.22.17 lakhs) and for Treatment Reactor (Rs.2.55 lakhs), Brine chilling plant (Rs.2.60 lakhs), Mechanical classifier (Rs.0.92 lakh), Glasslined reactors (Rs.0.90 lakh), Forklift (Rs.2.75 lakhs), etc. Sanctions were also issued for purchase of vehicles, additional land, construction of watch tower etc. The complete details of all capital expenditure were not made available. However, as per revenue and capital expenditure account Rs.62.94 lakhs was incurred during 1979-80 to 1985-86. DOS stated in November 1988 that additional capital expenditure on civil works and land incurred in subsequent years was dictated by additional security requirements considered necessary by Government of India. Some of the capital equipments were purchased to develop new products like perchloric acid and strontium perchlorate.

Despite additional doses of capital and remedial action taken, the production of ammonium perchlorate was below capacity. The annual production and operational expenditure was as under:

Year	Production (in tonnes)	Operational expenditure (Rs. in lakhs)
1977-78	Nil	23.28
1978-79	15.00	17.83
1979-80	36.60	24.97
1980-81	29.44	29.88
1981-82	36.50	40.97
1982-83	89.00	32.41
1983-84	62.70	35.40
1984-85	92.00	33.69
1985-86	90.00	44.47

DOS stated that the production was low due to teething problems like premature anode failure, high anode consumption, lower grade indigenous graphite substrate etc. Upto 1981-82, problems in production were identified and remedial measures were taken. In 1980-81 the production had fallen because of power shortage. In 1983-84, the production had fallen due to graphite shortage. DOS also stated that these unanticipated teething and technical problems led to derating of the capacity to 110 tpa. In November 1988, it was stated that production was not required to be high since demand for ammonium perchlorate had not picked up due to slippages in the SLV/ASLV programmes.

The production was dependent mainly on the capacity of Cell House to produce sodium perchlorate and the capacity of process house to convert it into ammonium perchlorate. As a result of various modifications carried out, the process house built a capacity of 150 tpa However, the Cell house could not produce adequate sodium perchlorate due to the operational efficiency of graphite substrate lead dioxide anode system. The anode system had limitations with regard to life, dimensional stability etc. A new anode system based on titanium was developed in March 1988.

In the absence of manufacturing account, the cost of production was not available. However, the operational expenditure of Rs.282.90 lakhs during 1976-77 to 1985-86 resulted in production of 451.24 tonnes of ammonium perchlorate at a cost of about Rs.62.69 per kg. The operational expenditure mentioned above does not include items of expenditure incurred on behalf of the plant at units other than at Alwaye. Thus the cost of production was in excess of Rs.62.69 per kg. The cost is very high as compared to the projected production cost (Rs.15.35 per kg) as well as the market price (Rs.34.87 per kg) at which ammonium perchlorate had been purchased during April 1983 to January 1987. DOS stated (November 1988) that ammonium perchlorate was being purchased at Rs.49 per kg since January 1987 with an escalation clause for future supplies and after giving an advance of Rs.40 lakhs. However, since the average cost of production and average market price of the same period i.e. before 1987 are being compared, the comment holds good.

Since the production of ammonium perchlorate was low, DOS entered into an agreement with a private supplier in February 1983 for supplying 500 tonnes of ammonium perchlorate during 1982 to 1987 at the rate of Rs.21.70 per kg. The agreement also provided for escalation from the second batch. However, only 38.98 tonnes had been bought during April 1983 to January 1987. Under the second batch, DOS purchased 158 tonnes of ammonium perchlorate at a cost of Rs.49 per kg.

The Pollution Control Board had stated that the plant was situated in a land-locked location with no streams or sea nearby to let out the effluent. The only available method

of disposal was through underground trenches. In view of this, additional expenditure had to be incurred for effluent treatment and disposal. DOS stated (November 1988) that regular arrangements have since been made.

Earlier DOS had stated (September 1987) that the plant was only an experimental plant and so the comments regarding low production, cost of production etc. were not appropriate. This is not tenable because in April 1975, it had been stated that the 150 tpa plant was the result of conversion of the pilot plant into regular production cell. It was also stated that 150 tpa had been decided upon as a departmental undertaking. In response to an Audit query, it had also been stated (August 1986) that 150 tpa plant was the result of the experience gained in running a modular unit at Vikram Sarabhai Space Centre (VSSC). Further, looking at the scale of operation, investment and length of time involved it is difficult to percieve the operation as experimental. DOS further stated (November 1988) that since the plant was engaged in development of process parameters for ammonium perchlorate as well as in development of strontium perchlorate and perchloric acid and other research and development work, it could be considered as experimental. There is no strong case for such a view.

Further, despite a projected demand of 280 tpa in April 1975 and an agreement had been entered into in February 1983 for supplying 500 tonnes of ammonium perchlorate during 1982-87, the actual supply during that period was less than 100 tpa. DOS stated that this was due to various slippages.

In sum, in establishing and productionising ammonium perchlorate, all the project parameters of capital cost, time schedule, cost of production, achievement of rated capacity/ and timeliness of delivery of the product could not be achieved.

DOS stated in November 1988 that productionising ammonium perchlorate is a technological break-through and performance of the plant has improved since May 1988 and is providing approximately 18 - 20 tonnes per month. While not minimising the break-through, it is to be noted that it has been achieved after 12 years with major changes in equipments, processes, anode characteristics etc.

CHAPTER III

AUTONOMOUS BODIES

25. General

The accounts of autonomous bodies pertaining to Scientific Departments and which are receiving financial assistance from Government are being audited by the Comptroller and Auditor General of India under various provisions of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971.

As on 31st March 1988, there were 29 Central autonomous bodies of Scientific Departments whose annual accounts were to be audited by the Comptroller and Auditor General of India under Section 14(1) and (2) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. During 1987-88 grants amounting to Rs.2080.17 lakhs were paid by the Union Government to 7 bodies. The annual accounts for 1987-88 in respect of 22 bodies had not been received (December 1988). Out of these 22 bodies grants amounting to Rs.6340.79 lakhs had been received by 20 bodies.

As on 31st March, 1988 there were 5 Central autonomous bodies which are under scientific departments and whose annual accounts were to be audited by the Comptroller and Auditor General as sole auditor of these bodies under Section 19(2) and 20(1) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. During 1987-88 grants and loans amounting to Rs.39624 lakhs were paid by the Union Government to 5 autonomous bodies. The audited accounts of these autonomou sbodies along with the Separate Audit Reports on each individual body/ organisation are presented to the Governmentof India every year for being placed before Parliament.

25.1 Delay in submission of accounts by autonomous bodies

"The Committee on Papers laid on the Table of the House" recommended in the First Report (5th Lok Sabha) 1975-76 that after the close of the accounting year every autonomous body should complete its accounts within a period of 3 months and make them available for audit and that the reports and the audited accounts should be laid before Parliament within 9 months of the close of the accounting year. For the year 1986-87, audited accounts together with Separate Audit Reports thereon of 5 autonomous bodies (Scientific Departments) which were under audit by the Comptroller and Auditor General of India, were to be placed before Parliament. Out of these, the accounts of one autonomous body only were made available for audit within the prescribed time limit of 3 months of the close of accounting year. Submission of accounts in respect of Indian Council of Medical Research, Council of Scientific and Industrial Research and Indian Council of Agricultural Research was delayed from one to four months. The accounts of Wild Life Institute of India were received on 24th December 1987. The Committee on Papers laid on the Table of House granted extension of time to the Institute upto March 1988.

25.2 Outstanding utilisation certificates of grants

Consequent on the departmentalisation of accounts in the year 1976, certificates of utilisation of grants were required to be furnished by the Ministries/Departments concerned to the Controllers of Accounts in respect of grants released to statutory bodies, non-government institutions, etc. for specific purposes indicating that the grants had been properly utilised on the purposes for which they were sanctioned, and that, where the grants were conditional, the prescribed conditions had been fulfilled. The Ministry/Department-wise details indicating the position of outstanding utilisation certificates are given in Appendix-I.

MINISTRY OF AGRICULTURE DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION

Indian Council of Agricultural Research

26. Delay in enhancing the performance of an equipment

The Central Tuber Crops Research Institute (CTCRI), Trivandrum, a constituent unit of the Indian Council of Agricultural Research (ICAR)

and conducting research on tuber crops, had in possession, one Beckman Model L5-50B preparative ultra centrifuge for research work on virus purification/identification. In the Institute it was mainly used for isolating and concentrating plant viruses and for preparing materials for serology, electron microscopy etc. In order to utilise the equipment to handle large samples in a short time with more precision, the CTCRI decided to purchase certain spares and accessories. An indent was placed on the Directorate of Supplies and Disposals (DSD), Madras in September 1983 and an amount of Rs.2.57 lakhs was deposited (Rs.2.31 lakhs in August 1983 and Rs.0.26 lakh in July 1984). The DSD placed the Acceptance of Tender (A/T) in June 1984 on a foreign supplier through their Indian agent for delivery in July 1985. Necessary Letter of Credit (LC) was also opened. However, the LC carried an inspection clause though the A/T did not contain any such clause. Due to such inspection clause in the LC, the foreign firm could not despatch the stores. The Indian agent requested DSD for deletion of the clause in May 1986. However, the Chief Controller of Accounts, Department of Supply, who had opened the LC and who had to advise the bankers, did not take necessary action. The delivery period was extended from time to time by the DSD at the request of the CTCRI and the last extension was granted upto 30th September 1987.

Since the supply of spares was badly delayed, CTCRI requested the DSD in September 1987 to cancel the order and refund Rs.2.57 lakhs paid in August 1983/July 1984. The A/T was cancelled in November 1987 and CTCRI preferred refund of deposit which is still awaited (September 1988). ICAR confirmed the facts in September 1988.

Due to non-receipt of accessories, the CTCRI could not enhance the scope of the application of the equipment and a sum of Rs.2.57 lakhs has been blocked for the last 4-5 years due to inaction in getting the inspection clause removed from the LC though no such clause was included in the Acceptance of Tender.

27. Unfruitful expenditure on procurement of a gas chromatograph

In January 1976, Central Rice Research Institute (Institute) Cuttack, a constituent unit of Indian Council of Agricultural Research (ICAR) placed an order with a foreign firm for supply of a Gas Liquid Chromatograph with accessories for a sum of Rs.1.27 lakhs. The equipment was necessary for the evaluation of rice varieties for scent content which have export potential besides evaluation of the liquid composition of rice bran and of micro-organism which infects rice plant. The equipment was received at the port in March 1977 and reached the Institute in August 1977 and demurrage charges of Rs.1 lakh had to be paid as shipping documents were not received with the equipment. In September 1979 after a delay of two years the Indian agent of the foreign firm attempted to install the equipment. The delay was due to late procurement of a compressor, for the above equipment, by the Institute. The first compressor bought by the Institute at a cost of Rs.6000 (approx.) was found to be defective and another compressor had to be procured in July 1980. However, the attempt to commission the imported equipment failed as the Linear Temperature Programmer of the Instrument was found to be defective. After replacement of the defective part by the supplier free of cost in May 1980, another attempt was made in January 1981 to install the equipment and it also failed due to various other defects noticed in the equipment. After a lapse of another 3 years, an engineer from the foreign firm made another attempt in March 1984 to install the equipment but without success. Since then the equipment has been lying idle in the Institute without being installed. The non-installation of the Chromatograph for more than 10 years affected the work of the Scientist concerned and rendered the import infructuous. In June 1986, audit took up the matter with the Institute. Thereafter a legal notice was issued by the Institute in October/November 1986 followed by a reminder to the supplier in August 1987. ICAR stated (September 1988) that a case has since been filed against the supplier for recovery of the money paid for the equipment.

Thus, there was delay in clearing the equipment, delay in procuring the compressor, delay in installation of the equipment and delay in taking legal action to recover the money paid for the defective equipment. The investment of Rs.2.33 lakhs has yielded no benefit to the Institute in the last 11 years and the expenditure was unfruitful.

28. Avoidable excess payment of electricity and water charges

Since 1980, the supply of power to various divisions of the Indian Agricultural Research Institute (IARI), a constituent unit of the Indian Council of Agricultural Research (ICAR) is made in bulk by the Delhi Electric Supply Undertaking and old connections had been disconnected. A test-check in Audit revealed that the IARI continued to make payment in respect of the defunct connections on the basis of previous average monthly consumption without verifying the factual position. A sum of Rs.7.57 lakh was thus paid during January 1983 to 1986-87. Further, a sum of Rs.0.34 lakh was also paid by IARI for the electric connections installed in the premises of the Syndicate Bank and Kendriya Bhandar located in the IARI Campus for the period April 1983 to October 1986 though these were payable by the Bank and Kendriya Bhandar.

(b) IARI paid to the Municipal Corporation of Delhi (MCD) a sum of Rs.9.19 lakhs for two bulk water connections during May 1981 to August 1983 and February 1983 to September 1984. The payments were made on provisional basis pending adjustment on the basis of average actual consumption. On the basis of average consumption, MCD claimed charges at Rs.5,000 and Rs.3,969 per month respectively during the subsequent periods. The previous provisional payments have, however, not been adjusted resulting in excess payment of Rs.7.10 lakhs. The ICAR accepted the facts and stated in October 1988 that MCD have over claimed charges and have agreed to adjust the balance due against future bills.

Thus, there was excess payment of RS.14.67 lakhs and it has been admitted by the ICAR. The cases revealed that the system of checking bills and passing payments was not adequate and was being done in a routine manner leading to avoidable payments, non-adjustments and blockage of resources.

29. Recurring loss on the maintenance of gas house

For production of gas for use in different divisional laboratories, eight gas producers were installed in 1935 in the Indian Agricultural Research Institute (IARI), a constituent unit of Indian Council of Agricultural Research (ICAR). Six of them were coal fired and two Light Diesel Oil (LDO) fired. The six coal fired gas producers were used till 1981 and the two LDOs are being run with kerosene oil. The ethylene oil gas produced by this process was being used by five divisions while 25 other divisions are using the Liquified Petroleum Gas (LPG).

One cubic foot of ethylene gas is considered equivalent to 35 gms LPG but the heat value of one cubic foot of ethylene gas is only about 1000 BTU while 35 gms LPG has a heat value of 3200 BTU. During 1986-87, 1.67 lakhs cubic feet of ethylene gas was produced, incurring an expenditure of Rs.1.46 lakhs on pay and allowances, direct material like kerosene oil, contingencies, etc. The value of gas, so produced, in terms of LPG was only Rs.7965.00 and entailed an avoidable expenditure of Rs.1.38 lakhs. Such avoidable expenditure has been incurred for the last so many years. ICAR had earlier indicated (December 1987) that the change over to LPG was under consideration. However, in September 1988, it was stated that the change over would mean installation of 145 cylinders and outflow of Rs.15 lakhs which was not possible due to resource constraints. The reply is incorrect because the audit para points out only LPG equivalent of the LDO gas presently produced and not the cost of total gas required by all the divisions. Similarly, ICAR has wrongly calculated the amount of security deposit to be paid as Rs.5 lakhs for 145 cylinders and wrongly included Rs.5 lakhs for fire fighting equipments since they already exist. ICAR had also pointed out that though the staff is used predominantly for the gas house work, a part of their time is also used for other works of the division. Hence, it would not be realistic to account for their entire expenses for the maintenance of the gas house. This is an extenuating circumstance and since the value of gas produced is far less than the expenditure incurred on producing the gas and since it is a recurring loss, the need for early change is established.

30. Blockage of funds due to non-receipt of equipment

The Central Institute for Research on Goats (CIRG), Makhdoom, near Mathura, a unit of Indian Council of Agricultural Research (ICAR), placed an order on a firm for the supply of a Lypholizer in March 1983. An advance of Rs.2.70 lakhs was also paid by May 1983. In July 1984, the order was cancelled as supply was delayed though, the research work had suffered

and the project for which the machine was required was shelved due to non-procurement of the major equipment. The firm, however, refused to take cognisance of the cancellation of the order as excise duty and sales tax had already been paid by them. Since the CIRG insisted on the refund of the advance of Rs.2.70 lakhs, the firm contacted the Indian Veterinary Research Institute (IVRI), Izatnagar, another unit of the ICAR, which agreed (January 1985) to receive the machine against the purchase order already made out by the CIRG. As the firm failed to supply the machine to the IVRI even by March 1986, IVRI indicated it was no more interested in the supply of the machine.

The matter was taken up in Audit in July 1987. In August 1988, ICAR stated that a civil suit against the firm for the recovery of Rs.2.70 lakhs has since been filed and action against the officials who had released the payment to the firm in the absence of any agreement on the terms and conditions of payment is being initiated. Thus, a sum of Rs.2.70 lakhs continued to remain blocked for more than 5½ years.

31. Faulty planning leading to blockage of funds

The Central Institute of Fisheries Technology (CIFT), Cochin a constituent unit of the Indian Council of Agricultural Research (ICAR) got constructed a fire proof pilot plant shed and purchased equipment and machinery for conducting 'Pilot plant studies on production of fishery products on laboratory scale'.

The Central Public Works Department (CPWD) who was awarded the work of constructing the shed in November 1977, completed the construction and requested the CIFT to take over the building in May 1983. However, there were several incomplete items of work and these were brought to the notice of CPWD in August 1983. Though CPWD again intimated in September 1984 that the building was ready, some of the incomplete items pointed out earlier remained to be done. CPWD was reminded again in May 1985 but they informed the CIFT that the building would be handed over after completion of power outlets. However, the shed was taken over in February 1986 when some work was still incomplete. CPWD had incurred an expenditure of Rs.6.86 lakhs by the time the building was handed over. The CIFT took some time to shift the equipment/machinery to the newly constructed shed from the temporary shed.

The power supply necessary to operate the plant in the shed involved scaling up of low tension power supply. This need was proposed in 1982 but according to CIFT, approval by ICAR was delayed till September 1985. Thereafter the Cochin Port Trust who were supplying electrical energy to CIFT, was entrusted with the work in October 1985. The Port Trust awarded the work of installing a new transformer to a private firm in March 1986. The new transformer was received in February 1987 but the high tension cables were received after a further delay of six months and one and a half years after the order was placed in October 1987. The transformer was charged in November 1987. Thus charging of transformer took more than two years from the date of payment of advance of Rs.8.36 lakhs (October 1985) to Cochin Port Trust.

CPWD was also entrusted with the procurement, installation and commissioning of a steam-boiler for the pilot plant in April 1983 at a cost of Rs.9.06 lakhs. CPWD awarded the work to three different firms between July 1985 and July 1986. The boiler was despatched by the manufacturer in August 1985. Necessary approval for erection of the boiler from the Director, Factories and Boilers was received in November 1986. The erection is stated to have been completed and test fired (March 1988). Thus commissioning of the boiler was considerably delayed and had taken about 5 years to complete after the award of work.

ICAR admitted in April 1988 that there was some delay in accomplishing the connected works. The equipments and machinery were put to use from January 1988.

The case revealed that the building was generally completed in May 1983 but the necessary ICAR approval for a new transformer was given only in September 1985 and the transformer was ultimately got charged in November 1987. There was a time-lag of about 4½ years between building completion and transformer commissioning. Similarly, the commissioning of the boiler was delayed. Thus uncoordinated construction of pilot plant shed, purchase of equipments, installation of transformer, erection of boiler etc. led to idle investment of Rs.24.28 lakhs for varying periods.

32. Irregular payment of overtime allowance

Indian Agricultural Research Institute (IARI), a constituent unit of the Indian Council of

Agricultural Research (ICAR) have a fleet of eighty-eight vehicles including cars, jeeps, bus and mini-buses. Seventeen of these were declared unserviceable during the past three years. Six such vehicles have been certified as staff cars and eight are buses/mini-buses.

According to Rule 26 of the Staff Car Rules and in terms of the Ministry of Home Affairs instructions, overtime allowance at revised rate is payable to staff car drivers only. Jeep drivers and bus drivers are however, governed by the general orders on overtime allowance. In September 1984, IARI issued orders that jeep drivers/bus drivers should also be treated as staff car drivers for the purpose of overtime allowance which led to overpayment of Rs.2.30 lakhs during 1985-86. This was pointed out to ICAR and in December 1986, ICAR issued instructions to IARI that overtime allowance at the enhanced rates to other categories of drivers would not be admissible and therefore be stopped forthwith. Despite this, the IARI issued orders in February 1987 to continue the payment of overtime allowance at the enhanced rates to all categories of drivers except tractor drivers resulting in further overpayment of Rs.2.58 lakhs during 1986-87. In June 1987, ICAR asked IARI to earmark the vehicles to be used as staff cars so as to ensure a uniform policy in the matter of payment of overtime allowance. IARI identified in September 1987 all jeeps, vans and cars as staff cars and excluded only buses and mini buses and issued orders that overtime allowance will be payable to drives of all these vehicles as before at the revised rate.

The categorisation of 57 vehicles as staff cars by IARI simply to enable the drivers to claim overtime allowance at enhanced rates without proper basis was irregular. Also vehicles are sanctioned as staff cars at the time of administrative/financial sanction for purchase. Thus only 6 drivers of cars originally so sanctioned are entitled to enhanced overtime allowance.

ICAR stated in September 1988 that overtime allowance at enhanced rates was paid to bus/mini bus drivers during 1985-87 by treating them as staff car drivers because their duties were inter-changeable with other staff car drivers. The ICAR, has not contested the amount of overpayment worked out by Audit. However, ICAR is arranging to recover overpayment made to three bus/mini bus drivers and in respect of others, no reply has been received.

33. Delay in obtaining refund of customs duty

(a) The Central Institute of Fisheries Education (CIFE), Bombay, a constituent unit of the Indian Council of Agricultural Research (ICAR), imported spares for the motor fishing vessel 'SARASWATI' and paid customs duty amounting to Rs.11.23 lakhs during 1984 to June 1987 though CIFE had been informed by the Department of Agriculture and Research Education (DARE), in April 1985, that they were exempted from payment of customs duty since they were a declared research organisation. DARE further clarified in December 1986 that the Ministry of Finance need not issue any notification specifying the exemption in the case of CIFE.

In response to an Audit observation, CIFE stated in May 1987 that in view of the clarification obtained from DARE in December 1986, it was making an appeal to the Collector of Customs for refund of customs duty already paid. CIFE, however stated in February 1988 that the above spare parts were procured under Norwegian aid directly by the Norwegian Engineer-in-charge in India in view of the urgency and hence the refund of customs duty paid as per provisions of the agreement was not being insisted upon. The contention is not correct. The agreement provides for defraying customs duty where it was payable and not for payment of duty where it was not due. The agreement also does not preclude claiming of refund/exemption wherever it is possible under the rules. Thus, avoidable payment of customs duty in the above case amounted to Rs.11.23 lakhs.

(b) The Cotton Technological Research Laboratory (CTRL), Bombay, another unit of the ICAR, placed an indent for import of textile testing equipment - Digital Fibrograph Model-530 with calculator - with the Director General, Supplies and Disposals (DGSD) in September 1982. A sum of Rs.3.25 lakhs was deposited with the Department of Supply on 31st March 1982 for effecting the purchase. The CTRL paid customs duty of Rs.6.62 lakhs in April 1984 as the Custom Duty Exemption (CDE) and 'Not Manufactured in India' (NMI) certificates applied for in July 1983 from the Director General, Technical Development (DGTD) and DARE had not been received by them. In April 1985, the Ministry of Agriculture, Department of Agriculture, Research and Education had informed that

CTRL already stood included in the list of research organisations for exemption from customs duty. A claim for refund was rejected on the ground of non-production of CDE and NMI certificates. An appeal was made in March 1986 and both the certificates were also submitted. The Collector of Customs (Appeals), Bombay ordered de-novo consideration of the case in November 1986 after setting aside the earlier order and called for some more documents. The CTRL requested in December 1986 its clearing agent to claim refund of customs duty of Rs.6.62 lakhs. The refund is still awaited (October 1988) since the Indian agent could not trace the letter of authority issued in their favour in April 1987 for claiming the refund. CTRL stated that another letter of authority was issued in January 1988.

ICAR stated in Septmber/October 1988 that the matter for refund of customs duty has been taken up with the customs authorities. In the second case the authorities have agreed to refund the duty after the formalities are completed and in the first case the decision is still awaited.

DEPARTMENT OF ELECTRONICS

Regional Computer Centre, Calcutta

34. Administrative lapses in assessment of accommodation requirements

In anticipation of the growing demand for accommodation, the Regional Computer Centre (RCC), Calcutta, under Department of Electronics, constructed an additional floor in February 1984 at a cost of Rs.5.39 lakhs on a building belonging to Jadavpur University. The cost of the construction was adjustable against rent payable for the additional floor. Provisionally rent of Rs.20,000 per month was being accounted for by RCC.

With effect from March 1983, the RCC had hired from the National Council of Education (NCE), Bengal located in the University Campus 3200 sq.ft. on a monthly rent of Rs.8,000. RCC advanced to NCE Rs.2.50 lakhs which was adjustable at the rate of Rs.6000 per month from out of the rent. The Engineering Design Cell of the RCC consisting of 9 persons shifted to the NCE building and is reported to have occupied only 1/3rd of the area. The cell was reshifted to the Jadavpur University building in 1984-85 and is now occupying only 600 sq.ft. Since only a portion of the NCE floor was under occupation, the Executive Council reviewed the requirement of additional space in their meetings held in September 1983 and December 1984 but decided to continue the hiring of the building as space would be required for the future uses of RCC. The NCE building was finally vacated from 1st June 1986.

Thus, the RCC did not make realistic assessment of its immediate space requirements and 8000 sq.ft. constructed by it by February 1984 has not been under occupation. The additional space is earmarked for a computer system for which though a contract was signed in May 1986, the import licence is awaited and the letter of credit is also yet to be opened (January 1988). The accommodation hired was also in excess of requirements. The infructuous rent paid by the RCC on this account for the period March 1983 to May 1986 worked out to Rs.2.45 lakhs.

DOE stated in June 1988 that the expenditure was unavoidable. The case revealed that due to administrative lapses, there was infructuous expenditure of Rs.2.45 lakhs and blocking of funds.

MINISTRY OF ENVIRONMENT AND FORESTS

DEPARTMENT OF ENVIRONMENT, FORESTS AND WILDLIFE

Central Board for the Prevention & Control of Water Pollution

35. Loss of revenue due to non-assessment and non-collection of water cess

The Water (Prevention and Control of Pollution) Cess Act, 1977, provides for collection of cess from specified industries and from all local authorities on the basis of water consumed by them at rates prescribed in Schedule II of the Act, as notified from time to time, in the Official Gazette. The cess so collected augments the resources of the Central Board and the State Boards for the prevention and control of water pollution, constituted under the Water (Prevention and Control of Pollution) Act, 1974. The Central Board for Prevention and Control of Water Pollution is an autonomous body under the Ministry of Environment, and Forests and is responsible for assessment and collection of cess in the Union Terri-

tories under the Act. Failure to pay cess by the due date by the industrial consumers attacts an interest liability of 12 *per cent per annum* on the amounts due till such time the amounts are actually paid.

Scrutiny of the records in August/September 1987 of the Central Board revealed that necessary records required for assessing and collecting the cess were incomplete. Action for assessing and collecting the cess had been taken only in respect of four Union Territories viz. Delhi, Chandigarh, Pondicherry and Goa. However, action in respect of the other Union Territories viz. Andaman & Nicobar Islands, Lakshadweep, Dadra & Nagar Haveli, Daman & Diu remained to be initiated even after a lapse of nine years after the Act had come into force. The Central Board stated (July 1988) that it was proposed to be taken up in 1988-89. The assessment in respect of the four Union Territories was also partial and assessments for 1985-86 and 1986-87 were in arrears. These were completed by December 1987 after Audit had taken up the matter in September 1987. According to the Central Board (December 1987) the work had suffered for want of a regular Member Secretary during the period May 1983 to June 1985, who was the competent authority under the Act to make assessments.

At the end of March 1987, a total sum of Rs.594.81 lakhs was outstanding on account of water cess. The Central Board stated (June 1988) that out of this, approximately a sum of Rs.500 lakhs was recoverable from Municipal Corporation of Delhi (MCD) and Delhi Electric Supply Undertaking (DESU). Out of this, Rs.132 lakhs were subjudice. The Central Board stated (June 1988) that for the balance Rs.368 lakhs efforts were being made for expenditious recovery. In respect of other assessees Rs.80 lakhs had been collected by April 1988 and a sum of Rs.14.81 lakhs was still recoverable from those other assessees (June 1988). Apart from cess, interest recoverable on the outstanding amounts had not been worked out and demanded in time. The interest payable by the MCD alone for the period 1978-79 to 1985-86 worked out to Rs.118.66 lakhs.

The Central Board stated (June 1988) that Rs.68.55 lakhs has been demanded from MCD for interest due till 1983 and for the period 1983-1988, a decision would be taken after the matter which was *subjudice* was settled.

Apart from delayed assessment/non-assessment, etc. the accountal of revenue realised by the Central Board against the demand could not be verified due to non-availability and incomplete maintenance of records. The Board stated (July 1987) that efforts were being initiated to maintain proper records to clear the backlog of assessments.

According to the Central Board it, was not possible to cover all the industries for water cess assessment due to limited manpower. Further, the expenditure in assessment and collection of cess could be more than the cess collected. The Ministry endorsed the views of the Central Board in June 1988. But a policy decision and amendment to the Act, if necessary, have not been made. In effect, the provisions of the Act, for the collection of water cess remain unenforced and even Municipal and Governmental Bodies are heavily in arrears.

MINISTRY OF HEALTH AND FAMILY WELFARE

DEPARTMENT OF HEALTH

Indian Council of Medical Research

36. Non-utilisation of land for 20 years

The National Institute of Virology (NIV), Pune, one of the units of the Indian Council of Medical Research (ICMR), acquired 40,460 sq. metres of land on 95 years lease at a cost of Rs.1.94 lakhs from the Maharashtra State Industrial Development Corporation (MIDC) in November 1967 for constructing an animal house and staff quarters. One of the conditions of the allotment of land was that within a period of one year, construction of the buildings should commence and it should be completed within 3 years.

The NIV completed fencing of the land at a cost of Rs.0.24 lakh in 1969. However, since the building construction had not commenced within the stipulated time, the MIDC at the request of the NIV extended the time limit upto October 1971. In February 1971, the NIV had second thoughts about constructing the animal house and instead went in for construction of an animal shed in its own premises. This was completed at a cost of Rs.2.08 lakhs by 1977.

Since a separate animal house was no more required due to changed circumstances, the

NIV enquired from the MIDC, in May 1971, as to the modalities for surrender of land and for getting refund of the purchase price. In June 1971, the MIDC passed an order for surrender of land and permitted refund of purchase price with 2 *per cent* reduction. In July 1971, the ICMR informed the Institute that the land should not be surrendered. Thereupon, the MIDC was again approached for extension of time for constructing the building and two such extensions were granted upto August 1973. No further extensions were granted and the MIDC cancelled the allotment in August 1984. Subsequently, the NIV was allowed to retain a reconstituted plot of 28,024 sq.mtr. at the same price and were allowed to complete construction by 30th June 1986. Thus, the NIV had lost 12,436 sq.mtr. of plot, the proportionate cost of which was Rs.0.60 lakh.

In January 1986, the NIV sent proposals for constructing a Diagnostic Reagent Laboratory and 18 staff quarters in the reconstituted plot at a cost of Rs.1.13 crores to the ICMR. In the meantime, NIV had deposited (March 1986) Rs.9.60 lakhs with the Maharashtra Public Works Department (MPWD) for starting the work. However, the work could not be commenced with the meagre amount. By March 1987, NIV had deposited Rs.70.67 lakhs after getting the necessary administrative approval and expenditure sanction from ICMR. Once again, since the MIDC had been allowed time only uptill June 1986 for completing the construction of the Laboratory, MPWD could not commence the work. Further extension of the time was sought by the NIV and it was granted in October 1987 for a period of two years. The MPWD is reported to have since prepared the detailed drawings and estimates for inviting tenders and fixing the agencies for construction of the building.

The case revealed that investment in land was made 20 years back without proper planning and this led to blockage of resources as well as to a proportionate loss of Rs.0.60 lakh at 1967 value level. Rs.70.67 lakhs deposited with the MPWD have also been blocked without any benefit accruing to the NIV. The ICMR stated (June 1988) that at the time when the original animal house was conceived for NIV, animals were the main stay for work. With the progress of time and advancement of science, a smaller animal shed within NIV campus was considered sufficient. Actually, however, it was the distance and transportation between the site for animal house and NIV (15 kms.) and absence of closed drainage system and other amenities which stood in the way. The ICMR had also mentioned about restriction of capital expenditure on new projects as one of the reasons for delay. However, ICMR's order of 1982 restricting such capital expenditure was an internal order. Further, in the instant case, land had been acquired 15 years earlier, in 1967, and had remained unused.

37. Blocking of funds on purchase of Liquid Scintillation Counter

The Immunology Division of the Cytology Research Centre (CRC), Delhi, a constituent unit of the Indian Council of Medical Research (ICMR), proposed to import a liquid scintillation counter (Beta and Gamma Isotope) in January 1983 for their radio immuno-assay studies. After obtaining quotations from three local agents of three foreign manufacturers, an order for purchase of the equipment was issued to firm 'A' on 26th February 1983, at a cost of Rs.2.99 lakhs. The equipment was received in July 1983. A scientist of CRC was also trained at the Bhabha Atomic Research Centre for the purpose during April 1983. However, the equipment could not be put to use as it required a regular isotope laboratory with necessary safeguards for protection against radiation, which was not available at CRC. The equipment is lying idle since the date of its receipt (July 1983).

Although the Director of the CRC had sought guidance about the procedure to obtain various isotopes from Bhabha Atomic Research Centre to be used at the CRC isotope laboratory and was quite aware about the need for an isotope laboratory as long back as August 1982, this equipment was purchased by the CRC without first ensuring the availability of adequate space including an isotope laboratory. Thus, due to defective planning, the acquisition of the equipment had resulted in blocking of funds to the extent of Rs.2.99 lakhs for more than five years and the training given to the scientist had become infructuous.

Audit had taken up the matter in May 1987 and in September 1988 ICMR stated that since CRC did not have adequate space the equipment, has been shifted to the Nuclear Medicine Laboratory of the Lok Nayak Jaiprakash Narain Hospital, New Delhi where it will be utilised both by the Hospital and CRC staff.

38. Administrative lapses in prepositioning facilities

An Atomic Absorption Spectrometer costing Rs.5.28 lakhs was ordered for in October 1985 by the Rajendra Memorial Research Institute of Medical Sciences, Patna (Institute), one of the constituent unit of the Indian Council of Medical Research (ICMR). The Instrument was to be installed by the supplier at a cost of Rs.0.11 lakh. It was a sophisticated instrument used for determining the levels of antimony and other metals in blood of kala-azar patients, quite a large number of whom were reported to be unresponsive to usual treatment with antimonials. The supplier was paid an advance of Rs.4.68 lakhs in March 1986.

The instrument was received in the Institute in June 1988 but had not been installed so far (June 1988) since the Institute could not complete the necessary pre-installation arrangements, even though the supplier himself had requested for such arrangements to be made ready in November 1985. The Institute stated that guidelines to make pre-installation arrangements had been received from the firm at the end of April 1986. These were of such a nature like gases, compressor etc. with particular specifications which were not easily available at Patna and had to be procured from outside, calling of quotations etc. Even after all these were ordered for, the supply was not forthcoming. This is not tenable because 24 months have elapsed after the equipment has been delivered. Two numbers of P.C.13 of the microprocessor which were found defective and taken away by the supplier in December 1986 for repairs/replacement had not been replaced till March 1988. Similarly, extension of the warranty period which expired in February 1987 has not been concurred in by the suppliers till June 1988. Also gas cylinders required for commissioning has not yet been procured.

Thus, premature ordering of the equipment, when the difficult ground conditions for getting ready the pre-installation facilities were within the knowledge of the Institute, resulted in blockage of funds of Rs.4.68 lakhs for more than 24 months. The ICMR accepted the basic facts in March 1988 and the Ministry of Health & Family Welfare endorsed it in May 1988.

MINISTRY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Council of Scientific and Industrial Research

39. **Remittances of funds to laboratories/ institutes - inadequate monitoring resulting in blockage of funds**

The Council of Scientific and Industrial Research (CSIR) remits funds to its Laboratories/Institutes through bank advices. In March 1986, it remitted Rs.102.55 lakhs to various Laboratories/Institutes. However, the fund remitted to the Central Mining Research Station (CMRS), Dhanbad and Industrial Toxicology Research Centre (ITRC), Lucknow amounting to Rs.30.00 lakhs remained to be accounted for by those two institutions till March 1987. No review regarding receipt of remittance was undertaken and consequently Rs.30.00 lakhs had remained as "Funds in transit" with the banks without reaching the Institutes. The CSIR stated (December 1987) that Rs.20 lakhs remitted to the CMRS had been accounted for by the bank after 20 months in November 1987. In the second case, the amount was not accounted for even after 21 months (December 1987).

Subsequent to the reply by CSIR, a review of such remittances as at the end of March 1985, 1986 and 1987 was undertaken and it was seen that in the case of 10 Institutes non-accountal of Rs.91.65 lakhs was noticed for periods in excess of 10 months.

The transactions represented blockage of funds as well as inadequate monitoring of "funds in transit". Due to such inadequate monitoring there was loss of interest to CSIR.

40. **Delay in commissioning an imported Multiple Hearth Furnace**

The Regional Research Laboratory (RRL), Bhubaneswar, a constituent unit of the Council of Scientific and Industrial Research (CSIR), required a Pilot Multiple Hearth Furnace for the project "Agglomeration of ore fines with particular reference to Chromite", which was started in 1982 in collaboration with Federal Republic of Germany. A purchase order for the furnace was placed by the RRL in February 1983 on a West German firm for DM 278,800 (Rs.12.55 lakhs). The furnace reached Calcutta

port in December 1983 and could be cleared only in March 1984 due to delay in clearance formalities. The furnace was transported to Bhubaneswar in June 1984 by paying transportation charges of Rs.0.09 lakh. For obtaining accurate results of research and development experiments, instrumentation of the furnace was to be taken up in two phases viz. (i) supply of the instruments and (ii) installation and commissioning of the same. An order for instruments was placed in December 1984 on a Calcutta firm at a cost of Rs.2.77 lakhs (including cables worth Rs.0.60 lakh) and these were received in October 1985. For erection and commissioning of the instruments, another order for Rs.0.55 lakh was placed with the same firm in August 1986. The furnace commissioned in April 1987 was being used for collection of only approximate data by manual methods, as complete installation/commissioning of the instruments had not been done (December 1987).

The CSIR stated (December 1987) that construction of building was entrusted to the Central Public Works Department (CPWD) in March 1983 and it was completed only by middle of 1986 and electricity was made available to the building in the first week of December 1986. Consequently, the machine could not be installed till December 1986. Further, there has been some malfunctioning, which is being rectified departmentally.

The CSIR admitted (May 1988) that there has been delay in various stages in the installation of the main furnace and the instrument. It was further stated that when the installation of instruments was completed which was likely to be taken up shortly, all the process parameters would be continuously measured in place of manual measurement.

The case reveals inadequate administrative back up in as much as the order for instrumentation for the furnace was issued only in December 1984, i.e. one year after the furnace landed in Calcutta and there was inadequate interface between prepositioning of infrastructural facilities and installation of the machine leading to a delay of about 4 years. The imported machine remains to be fully utilised. Thus, the very purpose of ordering for the imported furnace and instrumentation thereon at a cost of Rs.15.48 lakhs for obtaining accurate data remains unfulfilled.

41. Delay in installing an imported equipment

The Regional Research Laboratory (RRL), Bhubaneswar, a constituent unit of the Council of Scientific and Industrial Research (CSIR), placed an order in February 1983 for a coal analyser on a foreign firm at a cost of Rs.1.77 lakhs. The equipment arrived at Calcutta airport in May 1983 and at the RRL in August 1983. A sum of Rs.3600 (approx.) was paid as terminal charges. The consignment was opened in December 1983 and it was reported that the refractory insulation of the furnace door was found broken completely. The matter was taken up with the supplier in July 1984 and on their advice, with the underwriters in August 1984. The claim was finally limited to Rs.0.03 lakh since only the furnace door insulating unit had been separated and the underwriters advised that it could be repaired/replaced. The claim on the underwriters remains to be settled (May 1988) even after a lapse of more than 3 years.

Earlier in July 1983, the Indian agent of the supplier had intimated the RRL that 3 items which had been short-shipped were being shipped within three weeks thereafter. The RRL did not follow this up with the supplier. The matter was taken up with the Indian agent in September 1985 when the engineer of the Indian agent visited the RRL. Thereupon, it also came to light (September 1985) that the second shipment of the short-shipped parts had been lost in transit. The RRL lodged a claim against Air India in September 1985 for a sum of Rs.0.21 lakh being the value of the goods lost in transit. Air India advised in April 1986 that the claim was made in a defective manner and was also delayed by more than 1½ years. Subsequently in July 1986, Air India agreed to settle the claim on weight basis for a sum of Rs.300 ($ 27.21) since the value of the equipment had not been declared. CSIR stated that the offer of Air India to compensate on weight loss basis was not acceptable and the matter was still being pursued (May 1988).

In January 1986, Audit took up the matter of non-installation and blocking of capital with the CSIR. The RRL wrote to the Indian agent of the supplier in October 1986 for installing the equipment at a fee of Rs.0.06 lakh. However, the RRL had not included the installation clause in the original purchase order because the instrument was a plug=in and use type. In February 1987, the engineer of the Indian agent advised that additional parts were required for installing the machine and these were ordered for at a cost of Rs.0.25 lakh. The equipment is reported to have been commissioned and is working satisfactorily since June 1988.

The case revealed that the imported equipment procured at a cost of Rs.1.77 lakhs to speed up the testing of samples had remained idle for about 5 years. There were series of delays and even the short-shipment intimated by the Indian agent of the supplier in July 1983 had not been followed up till September 1985.

42. Improper interface between infrastructural facilities and acquisition of equipments

For the Project "Augmentation and modernisation of mineral beneficiation facilities", National Metallurgical Laboratory (NML), Jamshedpur, a constituent unit of Council of Scientific and Industrial Research (CSIR), ordered two equipments, viz. Agitair type flotation cells and thickener with accessories.

For the first equipment, a purchase order was placed in March 1981 at a cost of Rs.6.97 lakhs without any inspection clause or firm delivery date. The equipment arrived in 7 consignments and the last consignment reached the laboratory by December 1982. A sum of Rs.0.10 lakh had been incurred as wharfage charges. The consignments, on opening, were found to be in damaged condition and a number of short supplies were also noticed. A joint inspection with the supplier was conducted in November 1983 and three out of five short/damaged supplies were made good by September 1984. In all, Rs.6.53 lakhs had been paid to the supplier in addition to wharfage charges and Rs.0.35 lakh was withheld towards short/damaged supplies.

In February 1985, the Stores Officer of the NML recorded that the equipments opened for visual inspection were lying in unpacked condition for want of storage space. He had also stated that structural materials were lying in the open in transit stores and getting corroded. However, it was seen in audit that CSIR had allotted funds for construction of sheds for mineral beneficiation in 1979-80 and 1980-81 but the funds were not utilised. Therefore, after 1980-81 CSIR did not allocate funds. After the Stores Officer made the reference, the NML, in October 1985 obtained from a private company the estimated cost (Rs.35.35 lakhs) for constructing the Mineral Beneficiation Processing Sheds where these equipments were to be installed. However, no tenders were floated by the NML because it was felt that reasonably good contractors were not generally interested in the kind of work under the rigid governmental rules and regulations. It was decided that the work could be awarded to the National Building Construction Corporation (NBCC), which was already constructing the Scientists apartments at the NML. In October 1986, NBCC intimated the estimated cost of work as Rs.59.52 lakhs and NML approved the cost and sanctioned Rs.5.30 lakhs as mobilisation advance. Till the end of October 1987, the NBCC had completed work valued only at Rs.9.23 lakhs. No agreement was executed between NBCC and NML regarding the above work, though the work was intially expected to be completed in 12 months. The due date for completion is not ascertainable in the absence of agreement.

The NML had ordered for the Thickener with accessories in November 1981 at a cost of Rs.3.58 lakhs. The suppliers were the same as in the case of Agitair type cells. The consignments were received at NML by February 1983. The joint inspection of these equipments was also conducted in November 1983 and there were three short/damaged items valued at Rs.0.13 lakh. One of the short items valued at Rs.0.08 lakh was made good by September 1984. The firm had been paid Rs.3.59 lakhs inclusive of taxes after withholding Rs.0.10 lakh for short supplies. The Thickener with accessories was also lying idle since 1982. CSIR stated (June 1988) that the Thickener is under installation.

It was further noted in Audit (January 1988) that in the Project Budget (Revised Estimate) 1983-84, six other equipments valued at Rs.49.55 lakhs had been included for the project "Augmentation and modernisation of mineral beneficiation facilities'. The equipments were stated to be necessary to complete the plant and unless these were purchased, the floatation cells and the thickener would remain unutilised. The equipments are, however, yet to be received (June 1988). CSIR stated that the delay was due to budgetary constraints. However, as stated earlier, funds were provided even in 1979-80 and 1980-81 for mineral beneficiation processing sheds but was not utilised.

Thus, Rs.10.22 lakhs remained blocked for the last five years due to improper interface between procurement of the equipments and construction of necessary sheds. The equipments were also stored in the open for lack of requisite storage space. The thrust area project of mineral beneficiation has been stretched to 8 years and even the initial assemblage of facilities and equipments is incomplete. The construction work costing about Rs.59.52 lakhs has been

awarded without proper agreement and remains to be completed.

43. Non-installation of Elemental Analyser resulting in blockage of capital

The Regional Research Laboratory (RRL), Jorhat, a constituent unit of the Council of Scientific and Industrial Research (CSIR), placed an order in February 1983 on a foreign firm for supply of an elemental analyser at a cost of Rs.5.16 lakhs including Indian agent's commission of Rs.0.97 lakh. The analyser was for analysing the carbon, hydrogen and nitrogen gases in a single sample. The equipment, which arrived at the Calcutta airport in August 1983 was released by the clearing agent in October 1983 and was kept in the transit depot in Calcutta till April 1984, when it was brought to the laboratory at Jorhat by road by a departmental truck. An expenditure of Rs.4.22 lakhs was incurred for the procurement of the equipment. The terminal charges paid were Rs.0.08 lakh. CSIR stated (May 1988) that considering the delicate nature of the equipment and the bottlenecks involved in rail transport a little time was consumed in arranging transportation by road. The Indian agent 'A' had attempted to install it in June 1984 and several times during 1985 but it could not do so as the oxygen tube furnace in gas purification accessory did not work. Helium and oxygen gas, the essential pre-requisites for commissioning, could not be arranged by the laboratory though the need for high purity helium gas had been brought to the notice of the laboratory in September 1983 itself. The five empty gas cylinders sent by RRL for filling in extra pure oxygen gas in July 1984 were stated to have been received back (October 1985) with nitrogen gas instead because of the mistake of the supplier. The empty cylinders were once again sent for filling in the pure gases, only in February 1986 after consuming the nitrogen gas in the normal course. The gases are yet to be received (July 1988).

In January 1986, the supplying firm appointed a new Indian agent 'B' who was made responsible for installation of the instrument. In March 1987, 'B' visited the laboratory. He found the gas purification accessory damaged, solid state relay to the furnace inoperative etc. and accordingly advised the laboratory to procure replacements in order to commission the instrument. The additional expenditure is expected to be Rs.0.07 lakh. The supplier was addressed in July 1987 for free replacement. The laboratory also stated that they were also trying to procure the spares. The laboratory, however, could neither procure the required spares nor could arrange for the gases so far. A sum of Rs.0.73 lakh had also been paid as 75 per cent of the agency commission in January 1986.CSIR stated (September 1988) that the basic equipments has been installed but a few more spares are needed for satisfactory working of the equipment. The Indian agent has requested the Principal in August 1988 to ship the spares. The equipment is expected to be in full working condition after the receipt of spares.

Thus the equipment has not been fully installed for the last 5 years and Rs.5.03 lakhs remained blocked.

44. Inadequate administrative backup for installation of an airconditioning plant

The Regional Research Laboratory (RRL), Jorhat, one of the constituent units of the Council of Scientific and Industrial Research (CSIR), proposed (1980-81) to have its bio-science block air-conditioned. It was approved in January 1983. The work for installation and commissioning of the air-conditioning plant was awarded in March 1983 to a firm for Rs.10.43 lakhs with the stipulation to complete the work by September 1983. The RRL was to provide infrastructural facilities for the above work in the form of construction of sub-station, installation of transformer, laying of cables, obtaining power at the required voltage, etc.

The RRL asked the Assam State Electricity Board (ASEB) in 1983 to draw a 11 KV line from the existing 33 KV sub-station. The work was completed by the ASEB in September 1986.

Since the ASEB delayed the drawal of power lines till September 1986, the firm could not complete their work by September 1983. In September 1986, the air-conditioning plant was commissioned but it was noted that the compressor could not be operated due to leakage of freon gas from the plant. In October 1986, the RRL sent a telegram to despatch the required refrigerants. In reply, the firm asked (November 1986) for a regular purchase order to be placed with a committment to pay since the firm had already supplied the gas once, for trial running of the plant. Only in July 1987, the RRL placed such a purchase order. The refrigerants are stated have been received in February 1988. However, in September 1988, the RRL stated that defects

in the air-conditioning plant were persisting and it had not yet been handed over.

Till March 1984, Rs. 9.23 lakhs had been paid to the firm and Rs. 0.18 lakh will be payable for the additional supply of refrigerants. There were avoidable delays in ordering and obtaining the refrigerants and in commissioning the plant, resulting in blockage of funds for the last five years without any benefit flowing to the Institute.

45. Loss of revenue due to lack of timely decision

During 1960, the Railways had laid at its own cost a siding line of about 1½km long from near Jamadobe, on the Gomoh-Adra section of South Eastern Railway, to Central Fuel Research Institute (CFRI), Dhanbad at a cost of about Rs. 4 lakhs, so that bulk coal samples could be brought and tested at the pilot plants of the CFRI for washability, carbonisation, etc. The understanding with the Railways had been that CFRI would carry out investigation on Railway samples free of cost, while it could also use the railway siding.

According to the CFRI, 52 bulk samples were received from Railways in 1960-61. Thereafter no bulk samples seemed to have been recieved at the siding as no large scale testing of bulk samples was done. In addition, about 3000 non-bulk coal samples per year were received for testing at Coal Survey Laboratories and General Analytical Section. The CFRI addressed the Railway Board in February 1987 stating that the value of the analysis work done for the period 1960-1986 was over Rs.40 lakhs. The CFRI had also informed the Railway Board that the Executive Committee of the CFRI had decided in February 1986 that the cost free analysis of the coal samples would be discontinued from April 1987. The suo-moto decision was taken by CFRI in February 1987 as no positive response was received from Railway Board to CFRI's earlier references in April 1986. To an audit observation CFRI stated that the agreement with the Railways did not specify any time limit for running the cost-free service because it could not be visualised that the large-scale washability and carbonisation tests on bulk samples would be discontinued after some time.

It was seen that the bulk samples were not received for testing and after 1971 occasionally bulk samples were received by road only. Even according to CFRI, the siding was not used from 1972 but the matter of terminating the cost free service was taken up only in 1977 i.e. after a delay of 5 years. The final decision to discontinue free service was taken up in 1987 which meant a further delay of 10 years. Further, the railway tracks had been disconnected in 1983 and atleast then the CFRI should have reviewed the continuance of the cost free service and taken up the matter with the Railways. This was also not done.

The lack of timely action resulted in continuing the cost free service of over Rs.40 lakhs between 1960 and 1986 in lieu of railway siding worth Rs.4 lakhs.

46. Commencement of construction without proper architectural plans

Regional Research Laboratory (RRL), Jammu, a constituent unit of the Council of Scientific and Industrial Research (CSIR), undertook extension of the existing Auditorium (constructed in 1963) in order to increase its accommodation capacity. An estimate for Rs.3.28 lakhs was prepared in June 1982 and the building drawings were approved by the Director RRL, Jammu in February 1983. The work was awarded in September 1983 at a cost of Rs.5.20 lakhs and was to be completed within 9 months. Subsequently, it was felt that space below ground level in the basement area could be best utilised for scooter parking and a private consulting architect was engaged (September 1983) by the Director, RRL to do the fabrication and provide a model (October 1983) of the proposed building at a fee of Rs.2000. The architect supplied the architectural drawings on 23rd November 1983 and the structural drawings were to be supplied within 7 days thereafter. The work was started in December 1983, but the architect failed to furnish the detailed drawings. The contract with the architect was terminated in April 1984. In May 1984, the Chief Engineer, CSIR pointed out that there were discrepancies in the basic architectural concept of the construction and the entire project should be reviewed. However, another private architect was appointed in July 1984 as a consultant architect without consulting the Chief Engineer, CSIR and the architect provided complete drawings in April 1985. A sum of Rs.0.19 lakh was paid to him.

In the light of the revised drawings, additional quantities of material including extra steel was required (Rs.3.90 lakhs) and the cost of the work increased to Rs.10 lakhs. The work was also intermittently carried on for want of draw-

ings etc. The target date for completing the work was also shifted to November 1986. In August 1985, the work was suspended because it was noticed only then that if the auditorium was completed as per drawings, clear vision of the stage would not be possible. The matter was taken up with CSIR in November 1985 since the architect wanted change in the drawings and wanted to dismantle the roof of the existing auditorium. The Chief Engineer, CSIR replied that dismantling the roof of the existing auditorium is not feasible as it was likely to disturb the supporting structure and the floor slab of the auditorium itself was a suspended slab. As an alternative, he suggested lowering the existing stage to marginally improve the view and curtail the sitting capacity at the end by sacrificing two to three rows of chairs. He also stated that the extended auditorium will not be as efficient as it should have been and added that the private architects appointed by RRL were solely responsible for the defects. He had also suggested the termination of the existing building contract on 'as is where is' basis and accounts be settled.

The RRL stated (May 1988) that the existing building contract had been terminated and the contractor had been paid Rs.6.06 lakhs. The balance work of the auditorium has been entrusted to the Engineering Unit of CSIR who had prepared the estimates for completion of the auditorium at an additional cost of Rs.6.38 lakhs. Fresh tenders were invited (December 1987) and the contract was awarded on lowest tender basis on 15 April 1988 at a cost of Rs.8.43 lakhs on the terms and conditions suggested by Chief Engineer, CSIR in his letter of 20 January 1988. However, the contractor declined to accept (9th May 1988) since the prescribed period for allotment of contract in the Notice inviting Tender (NIT) had expired on 2nd April 1988.

The case revealed that the technical and architectural details had not been given due consideration despite the fact that the Chief Engineer, CSIR had warned regarding architectural concept as early as May 1984. Without complete and correct plans, the construction had been started and had to be abandoned mid-course due to architectural defects, which was noticed 16 months after submission of the drawings by the second architect. The work which was to cost only Rs.10 lakhs, as per the lowest tender, will now cost atleast Rs.8.43 lakhs plus Rs.6.06 lakhs already paid. The responsibility for completing the construction has now been entrusted to ESD, CSIR, whereas this inhouse facility could have been utilised much earlier or atleast in May 1984 when Chief Engineer made a reference. The delay in completion of the construction of atleast 4 years, calculated from September 1984 by which time the building should have been completed has meant blockage of funds.

47. Delayed installation of sophisticated imported equipment and avoidable expenditure

On the recommendations of a scientist responsible for coordination of micro-electronics programme in Central Electronics Engineering Research Institute (CEERI), Pilani, the Council of Scientific and Industrial Research (CSIR) agreed in February 1986 to the setting up of a 'Microlab' for its Micro-electronics programme. Accordingly, highly sensitive equipments were ordered for in February 1986 on a foreign firm through their Indian agent for £5,28,490 (Rs. 102 lakhs). The delivery was due in February 1987. Delay in delivery meant penalty of 0.5 *per cent* of the f.o.b. value for each two weeks' of delay. Free training of two scientists abroad and free installation of equipment were also stipulated in the contract.

Within two months of the acceptance of the proposal and placement of the order, the scientist advised (April 1986) that he wished to discontinue his services with CEERI due to personal reasons. The CSIR decided to accommodate the scientist and transfer him to Central Glass and Ceramic Research Institute (CGCRI), Calcutta since costly equipments had been ordered on his recommendations for the micro-electronics programme. In October 1986, the scientist was granted 4 months leave. While he was abroad, his leave was further extended upto August 1987 and the scientist was allowed to take an assignment as 'visiting-scientist' with International Business Machines, USA on the ground that his work will benefit CSIR.

In January 1987, the Indian agent proposed rescheduling of delivery to April 1987 since CEERI had not taken any action for the training of the two scientists and necessary laboratory space had not been earmarked. Though CSIR had agreed in August 1986 to transfer the scientist and the research programme to CGCRI, no action was taken to have the equipment directly shipped to CGCRI. Thus, equipments were delivered at CEERI in June 1987 and sent to CGCRI in August 1987. Additional insurance

coverage and storage charges amounted to £ 2967 and additional transportation charges amounted to Rs.21,000.

In August 1987, the scientist joined CGCRI and initiated installation proceedings. Till August 1988, the equipments had not been installed. In September 1988, it was reported that the equipments have been mostly installed except for a small portion which was mechanically operable. The delay was stated to be due to sub-assembly and components being damaged in transit, the engineers of the supplier not attending to installation work despite reminders, etc.

Thus, there was failure to divert the shipment to CGCRI at the right time leading to avoidable expenditure on insurance, storage and transportation charges amounting to Rs.0.80 lakh and there was blockage of capital of Rs.102 lakhs due to delay in installation.

MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY

Sree Chitra Tirunal Institute for Medical Sciences and Technology

48. Delay in commissioning an equipment for a research project

Department of Science and Technology (DST) conveyed its sanction in 1980 to Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum to undertake the project "Development of testing system for the evaluation of Cytotoxicity and quantiation of heavy metals in biomaterials" at a cost of Rs.6.60 lakhs for a period of 3 years including equipment worth Rs.5.10 lakhs.

Atomic absorption spectro photometer was the most important equipment to be acquired for this project. Accordingly a purchase order for this equipment was placed in December 1980 at a cost of Rs.4.74 lakhs on a foreign firm through an Indian agent. The consignment landed in Madras in April 1981. On inspection, the clearing agents noticed that the consignment was received in a damaged condition. Nine packages containing the damaged equipment were despatched to Trivandrum in September 1981. The scientist at the institute recorded in November 1981 that the equipment could not be installed as some vital components had been damaged.

The damaged equipment could not be replaced or repaired and put to use till the closure of the project in December 1983. In reply to Audit, the institute had stated in July 1988 that because of the delay in arrival and commissioning of the equipment and due to other factors the project could not be completed in time.

The Ministry of Science and Technology stated in November 1988 that the supplier has set right the equipment and commissioned it in February 1985. It is now being used by the various wings of the Institute. However, the toxicology studies were stated to have been carried out, to the extent possible, without the equipment. Thus Rs.8.54 lakhs spent towards salaries, equipment, materials etc. on the project could not achieve optimum results because of delay in commissioning the equipment.

CHAPTER IV

DEPARTMENTALLY MANAGED GOVERNMENT UNDERTAKINGS

49. General

On 31st March 1988, there were 5 departmentally managed Government Undertakings of commercial and quasi-commercial nature under the scientific departments.

The financial results of these Undertakings are ascertained annually by preparing proforma accounts outside the general accounts of Government.

With the formation of Nuclear Power Corporation of India Limited with effect from 17th September 1987, the proforma accounts in respect of Tarapur Atomic Power Station, Madras Atomic Power Station and Rajasthan Atomic Power Station II are to be prepared by the station authorities upto the period ending 16th September 1987. These are still awaited (December 1988) for scrutiny and certification.

Proforma accounts for the year 1986-87 have been received in respect of only 3 Undertakings. A synoptic statement showing the summarised financial results of all the departmental undertakings on the basis of their latest available accounts is given in Appendix-II. It will be seen therefrom that in two cases, proforma accounts are in arrears. The delays in the completion of accounts have been brought to the notice of the Department of Atomic Energy.

DEPARTMENT OF ATOMIC ENERGY

50. Blockage of capital due to inadequate planning

Directorate of Purchase and Stores, Department of Atomic Energy (DAE) placed a purchase order in June 1983 for the design, manufacture and supply of Fin Tube Heat Exchangers comprising of 14 economisers and 4 condensers at a total cost of Rs.27.26 lakhs. The economisers, as the name implies, are for recovering waste heat coming out of the vapour recovery dryer circuit. The lead time for delivery was 10 months. These were delivered in June 1984. The equipments were procured as replacement for the existing imported units which were found to be eaten away by nitric acid atmosphere because of which the efficiency of the existing aluminium economisers had been affected. Out of 14 economisers and 4 condensers, 12 economisers and 2 condensers worth Rs.21.63 lakhs were meant for Rajasthan Atomic Power Project (RAPP) and 2 economisers and 2 condensers were meant for Madras Atomic Power Project (MAPP). The 12 economisers have not been installed at RAPP as yet (August 1988).

The existing imported economisers were of the dimension of 28" x 25". The indigenous replacement economisers were made of steel having dimension of 65" x 35". RAPP had stated in December 1987 that the indigenous units were quite bulky and heavy in weight and its installation required support structure from the ground. Further, to install these economisers, the layout had to be completely changed and it required very long shut down of the plant. It was also intimated that such changes in layout would involve substantial modification costs. DAE stated in August 1988 that at the time of ordering of economisers it was fully realised that changes in ducting and equipment layout would have to be made and that this work could be taken up only during the period of shut down of the reactor as indigenous equipments would not obviously have the same design and dimensions as the original imported equipments.

However, th· economisers had been procured for RAPP-I in 1984 since the existing units were giving problems. According to DAE, RAPP-I had remained shut down since 1981 and is now operational at low power level. Thus, even at the time when these economisers were indented and procured the project was in shut down condition and the economisers could not be installed. Secondly, it was within the knowledge of the project authorities that the

indigenous design was very bulky and required major changes in the layout, support structure etc. Without planning for these changes, especially when the lead time for delivery of the economisers was only 10 months, the equipments were ordered and these have not been utilised in the last 4 years 3 months. DAE stated "the design of suitable supports and fabrication of the new ducting system are under examination, so that the existing economisers may be replaced during the annual maintenance outage which will normally last for 6 to 8 weeks".

Had the economisers been procured with adequate planning the investment of Rs.16 lakhs would not have remained unfruitful for such a long period.

51. Purchase of plastic suits in excess of requirement

Rajasthan Atomic Power Station (RAPS), Department of Atomic Energy (DAE) on the recommendations of the Radiation Protection Improvement Committee raised an indent for plastic suits to protect personnel working in the operating power stations from exposure to radiation. The initial assessment of requirement for these suits was 70 per annum. However, in December 1985, when the stock on hand was 1237 suits, a purchase order for 1000 additional plastic suits was placed. Firm 'A' supplied 500 suits in February/March 1986 at Rs.215 per suit. Firm 'B' supplied 500 suits in June and October 1986 at Rs.185 per suit.

Regarding the heavy inventory, DAE stated (March 1988) that 70 suits were replaceable twice a year and put the minimum requirement of RAPS at 300 suits per annum. It was further stated that while indenting, it was felt that the requirements of the other projects such as Narora Atomic Power Project (NAPP) could also be taken into account. 500 suits were purchased for NAPP keeping in view that NAPP was to become critical in 1987. NAPP-I is now expected to reach criticality only in December 1988/January 1989. It was further stated by DAE (October 1988) that about 1200 -1300 suits may be used during major maintenance job expected to be undertaken in October/November 1988 in RAPP-II. As regards actual utilisation, only 50 suits had been issued in November 1986 and another 50 suits in August 1987 and balance on hand was 1637 suits.

Since only 529 suits have been issued in the last 8 years, the order for 1000 additional suits in 1986 was not justified especially when the balance in stock was 1237 suits. The plea of using them for major maintenance job etc. and stocking them for more than 2 years does not seem to be a correct decision. Even after excluding the cost of 500 suits transferred to NAPP, which has not yet been used, Rs.4.48 lakhs are blocked in the inventory of 1637 suits, on first in first out basis.

52. Poor utilisation of railway siding at Nuclear Fuel Complex, Hyderabad

As against the installed capacity of 21,000 tonnes in the Ball Bearing Tubes Plant, Nuclear Fuel Complex (NFC), Hyderabad, the actual annual production varied between 153.47 tonnes in 1980-81 and 2765.87 tonnes in 1985-86. This had been commented upon in the Report of the Comptroller and Auditor General of India for the year 1985-86: Union Government (Civil). Since the production was low the traffic at the private railway siding was minimal and it was only 990 tonnes (54 wagons) of annual traffic on an average, in the last 7 years, as against the estimated traffic of 36,500 to 54,750 tonnes *per annum.* Also the 100 tonnes railway weigh bridge installed in August 1980 at a cost of Rs.5.66 lakhs had remained under-utilised.

In order to maintain the railway siding, NFC had spent Rs.9.66 lakhs during 1980-81 to 1987-88. NFC had also paid Rs.6.72 lakhs as shunting charges during August 1980 to 31st March 1985. Rs.0.52 lakh had been paid towards services of the railway staff upto June 1985 posted at the siding. In addition, a security deposit of Rs.0.92 lakh had been paid to the Railways in October 1984.

According to Clause 27 of the Agreement between South Central Railway and NFC, the siding could be opened for any other person in case sufficient traffic was not built up by NFC. This provision had not been taken advantage of. DAE stated in December 1988 that this provision cannot be availed of due to security considerations.

The under-utilisation of the facility was taken up in Audit and the Department had stated in November 1987 that NFC railway siding would be put to more use, in the coming years, for the movement of fuel bundles and for the movement of uranium concentrates, when nuclear power programme is enlarged. However.

it was seen that in all 68 wagon loads of material was handled to and from the siding of which only 34 wagon loads carried nuclear material. Department also stated in April 1988 that nuclear material could not be handled in the regular railway siding because no ramp is available to make use of fork lifts. This is a minor problem which could be easily overcome.

Since there are no dedicated siding for nuclear material at all places the need for dedicated siding only at NFC, on security considerations is not established. Department admitted in December 1988 that the siding was initially established for handling substantial quantities of steel which, however, could not materialise for various reasons. It was also stated that the siding had been put to the best possible alternative use and in the light of future needs, it would not be judicious to close down the siding at this stage.

Thus, there had been under-utilisation of private railway siding which was established in 1979-80 at a cost of Rs.20.37 lakhs. Department continues to incur about Rs.2 lakhs *per annum* on maintenance of the siding though the traffic is minimal. As regards weigh bridge, Department stated in December 1988 that since it was not being utilised, action was being taken to declare it surplus and dispose it off.

S Bathyamoorthy

New Delhi
The 16 MAR 1989

(S. SATHYAMOORTHY)
Director of Audit-II, Commerce, Works & Misc

Countersigned

T.N. Chaturvedi

New Delhi
The 17 MAR 1989

(T.N. CHATURVEDI)
Comptroller and Auditor General of India

APPENDIX - I

(vide paragraph 49)
Outstanding Utilisation Certificates

Ministry/Department	Period to which grant relates (Upto September (1986)	Number of utilisation certificates outstanding at the end of March 1987	Amount
1	2	3	4
			(In lakhs of rupees)
Atomic Energy	1976-77 to 1986-87		NIL
Electronics (CCI Wing)	1976-77	-	-
	1977-78	-	-
	1978-79	-	-
	1979-80	18	22.00
	1980-81	36	36.00
	1981-82	36	42.00
	1982-83	50	24.00
	1983-84	41	13.00
	1984-85	52	304.00
	1985-86	59	693.00
	1986-87	98	821.00
		390	1955.00
Environment and Forests	1980-81	35	42.42
	1981-82	101	59.99
	1982-83	142	171.90
	1983-84	100	134.29
	1984-85	501	959.11
	1985-86	122	224.08
		1001	1591.79
Ocean Development	1981-82	4	190.00
	1982-83	4	50.26
	1983-84	32	384.01
	1984-85	64	240.82
	1985-86	96	247.72
	1986-87	23	79.96
		223	1192.77

1	2	3	4
Science and Technology	1976-77	8	22.20
	1977-78	61	66.49
	1978-79	166	267.91
	1979-80	228	373.26
	1980-81	388	419.20
	1981-82	487	659.22
	1982-83	730	783.04
	1983-84	795	581.67
	1984-85	904	1586.17
	1985-86	1222	2921.96
		4989	7681.12
(i) Non-Conventional Energy Sources	1983-84	470	1618.22
	1984-85	740	3034.07
	1985-86	860	5826.54
	1986-87	260	1349.15
		2330	11827.98
(ii) India Meterological Department	(Upto September 1987)	3	0.99
Space	1976-77	1	0.05
	1977-78	1	0.15
	1978-79	2	0.08
	1979-80	5	0.39
	1980-81	13	1.40
	1981-82	13	6.76
	1982-83	41	21.79
	1983-84	44	38.21
	1984-85	95	50.52
	1985-86	74	56.23
		289	175.58

APPENDIX - II

(Vide-paragraph-49)

Summarised Financial results of departmentally managed Government Undertakings

Sl.	Name of the Undertakings	Period of Accounts	Government Capital	Block Assets (Net)	Depre-ciation todate	Profit(+) Loss (-)	Interest on Govt. capital	Total return	Percentage of total return to Mean Capital	Remarks
					(In lakhs of Rupees)					
1.	Tarapur Atomic Power Station, Bombay	1985-86	8618.31	3770.97	4147.18	(+)2033.52	1044.87	3078.39	17.26	The proforma accounts have been certified and issued on 5th December 1988
		1986-87	8808.48	3578.90	4431.38	(+)2212.71	1179.14	3391.85	17.84	The figures are based on the revised proforma accounts
2.	Heavy Water Pool Management, Bombay	1981-82	9829.11	1.10	0.84	(+)148.10	550.78	698.88	7.99	The Proforma Accounts for the year 1982-83 onwards are still awaited from the Department
3.	Madras Atomic Power Station, Kalpakkam	1984-85	11605.31	9868.18	435.04	(+)748.75	909.92	1658.67	13.36	The Proforma Accounts have been certified and issued to the Department on 18th Feb. 1988
		1985-86 MAPS-I	11301.74	9410.52	797.29	(+)958.19	959.95	1918.14	15.03	Proforma Accounts are under certification.
		(21-3-86 to 31.3.86) MAPS-II	11649.94	10834.25	11.70	(+) 49.58	28.16	77.74	0.67	
		1986-87 (MAPS-I & II)	23009.26	19786.63	1569.34	(-)742.41	1952.24	1209.83	4.95	Reply to audit query is awaited from the Department.

4.	Nuclear Fuel Complex, Hyderabad	1984-85	4679.58	3718.92	134.07	(-)518.03	958.52	440.49	3.43	The proforma accounts have been certified and issued to the department on 22nd Sept. 1988
		1985-86	4743.66	3581.38	267.99	(-)1997.41	1140.39	(-)857.02	-	The figures are based on unaudited Proforma Accounts.
5.	Rajasthan Atomic Power Station, Kota	1984-85	17671.06	12856.55	3759.60	(-)1852.06	1736.10	(-)115.96	-	Figures based on audited Proforma Accounts
		1985-86 1986-87 1987-88 (Upto 16.9.87)	-	-	-	-	-	-		Accuracy of figures in the Proforma Accounts awaited since large-scale changes in 1984-85 figures were found necessary.