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सत्यमेव जयते

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

**UNION GOVERNMENT
No. 12 (COMMERCIAL) OF 1992**

INDIAN TELEPHONE INDUSTRIES LIMITED

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
540 SOUTH EAST ASIAN AVENUE
CHICAGO, ILLINOIS 60607

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DEPARTMENT OF THE ARMY
HEADQUARTERS
WASHINGTON, D. C.

OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D. C.

ADJUTANT GENERAL'S OFFICE

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PREFACE

Audit Boards are set up under the supervision and control of the Comptroller and Auditor General of India (CAG) to undertake comprehensive appraisal of the performance of the companies and Corporations subject to audit by CAG.

2. The report on Indian Telephone Industries Limited was finalised by an Audit Board consisting of the following members:-

Shri. P.K.Sarkar	Deputy Comptroller and Auditor General-cum-Chairman, Audit Board.
Shri. K.Kuppusamy	Principal Director of Commercial Audit & Ex-Officio Member, Audit Board, Bangalore.
Shri A.K.Chakrabarti	Principal Director of Commercial Audit & Ex-Officio Member, Audit Board-II, New Delhi
Shri K.S.Menon	Principal Director (Commercial) and Member-Secretary, Audit Board.
Shri. Rangarajan	General Manager (Retd), Madras Telephones -Part-time Member
Shri. A.K.Banerji	General Manager (Telephones) (Retd) P&T Directorate -Part-time Member

The part time members are appointed by the Government of India (in the respective Ministry or Department controlling the company or corporation) with the concurrence of the Comptroller and Auditor General of India.

3. Audit Board held discussions with the representatives of the Department of Telecommunications.

4. The Comptroller and Auditor General of India wishes to place on record his appreciation of the work done by the Audit Board.

OVERVIEW

INTRODUCTION

I. The Indian Telephone Industries Limited (ITI) established in 1950, manufactures telecommunication equipment like Electronic and Digital Trunk Automatic Exchanges, Electronic Switching Equipment, Electronic Switching Systems, Transmission Equipment and Telephone Instruments. As at the end of March 1992 the authorised capital was Rs.100 crores and the paid-up capital Rs.88 crores, in which Govt. of India held shares for Rs.87.69 crores till it sold off shares for Rs.17.53 crores (nominal value) in 1991-92; Govt. of Karnataka held shares for Rs.0.31 crore.

(Paragraph 1 & 3)

DEVELOPMENT & PROJECTS

II. In nine major projects undertaken by the Company, cost overruns were from 2.49 per cent to 47.21 per cent and time overruns ranged from 14 to 82 months.

(Paragraph 4.2 to 4.10)

III. A project for manufacture of 5 lakhs telephones at Naini Unit, with an outlay of Rs.7.40 crores was shown as completed after creating facilities for manufacture of only 2.5 lakhs telephones, but expenditure of Rs.7.59 crores had been incurred by then.

(Paragraph 4.2)

IV. A project for manufacture of 1 lakh lines of Strowger Switching Equipment at Rae Bareli was closed after creating facility for production of 80,886 lines only, after delay of 82 months, because very little infrastructural facilities were available at Rae Bareli and no facilities for development of

ancillaries. Similarly, the project for manufacture of 2 lakh lines of ICP type Crossbar Switching Equipment at Rae Bareli was frozen at 1 lakh lines. But capital expenditure as originally envisaged for 2 lakh lines was incurred. The facilities created were only partially used, due to delay in implementation.

(Paragraph 4.3 and 4.5)

V. The project for manufacture of 5 lakh lines of 'E-IOB' Electronic Switching Systems was to be set up at Bangalore. While approving the project Government decided to locate the project at Mankapur, a green field area. As a result, Company had to incur expenditure of Rs.47.59 crores more than the original project cost of Rs.149 crores in providing industrial and general infrastructural facilities at Mankapur.

(Paragraph 4.7)

VI. A rotary telephone designed by ITI was approved by Department of Telecommunications in 1981-82. Introduction of electronic push button telephones was also decided upon in January 1982. It was to replace the rotary telephones. Still the Company entered into an agreement with a foreign collaborator for the manufacture of rotary telephones. The rotary telephones were assembled from component sets supplied by the collaborator. They did not initially meet the specifications of Department of Telecommunications. Subsequently the Company bought in all 1,90,000 component sets from the collaborator. Government had invited global tenders for the supply of electronic push button telephones but decided to continue collaboration with same collaborator for electronic push button telephones also as it was not considered desirable to have another collaborator.

(Paragraph 4.8)

VII. 17 R&D projects completed at a cost of Rs.3.58 crores were not productionised, for want of orders or availability of alternative equipment. 82 R&D projects, on which Rs.6.82 crores

were spent were abandoned or shortclosed because orders would not be forthcoming due to induction of foreign technology.

(Paragraph 5.6)

FINANCIAL PERFORMANCE

VIII. The overall financial performance of the company has been satisfactory. But its profitability is getting too much dependent on its one unit in Mankapur. The profitable Electronic City unit at Bangalore is coming up, and may prove a second profitable unit.

(Paragraph 5.1)

PRODUCTION PERFORMANCE

IX. Production was uneven during the year, and got bunched in the last quarter of the year. Evening out of production through out the year would increase productivity and also result in a saving of about Rs.3 crores on interest charges.

(Paragraph 5.2)

X. In Company's manpower of around 30,000 employees the Management stated that the policy of transfer of personnel from one unit to another could not be implemented. The phasing out of Crossbar Division at Bangalore rendered 2211 employees surplus by March 1988 and the phasing out of Strowger Division at Bangalore and Rae Bareli rendered surplus 4200 and 4000 employees respectively. Only 1717 employees and officers were retired under the voluntary retirement scheme. The Management estimated surplus manpower at Bangalore to be 1423 in 1990-91 and 410 by 1994-95. At Rae Bareli the estimated surplus by 1994-95 is 318.

(Paragraph 5.4)

MARKETING

XI. The Company's sales to customers other than Department of Telecommunications had come down from 11.3 per cent in 1986-87 to 6.7 per cent in 1990-91, indicating inadequate marketing efforts in ITI.

(Paragraph 6.1)

XII. The objective of the Company was to export telecom products valuing Rs.500 crores by the end of the Eighth Five Year Plan. The exports have ranged from Rs.0.53 crore to Rs.0.96 crore only between 1986-87 and 1991-92.

(Paragraph 6.5)

XIII. Sundry Debtors constituted 92.9 per cent of the sales of ITI in 1986-87 and 72.1 per cent in 1991-92 because of heavy bills sent by the Company at the end of the year.

(Paragraph 6.9)

XIV. The Company had to pay liquidated damages amounting to Rs.49.35 crores due to delays in supply made to Department of Telecommunications.

(Paragraph 6.2)

1. INTRODUCTION

1.1 The Indian Telephone Industries Limited (ITI) was established in July 1948, as a departmental undertaking of the Government of India. It was formed into a Company in January 1950, with an authorised capital of Rs.2.50 crores. By the end of March 1992, the authorised capital stood at Rs.100 crores and the paid up capital at Rs.88 crores. The Company has seven manufacturing units located at Bangalore(2) in Karnataka, Naini, Rae Bareli and Mankapur in Uttar Pradesh, Palakkad in Kerala and Srinagar in Jammu and Kashmir.

1.2 The Company started with the production of step-by-step Strowger Switching Equipment and telephone instruments under foreign collaboration in 1950-51. Presently, Telephone Instruments are produced at Bangalore, Naini and Srinagar, Transmission Equipment at Bangalore, Naini and Rae Bareli, Small Electronic and Digital Trunk Automatic Exchanges and Switching Exchange Equipment at Palakkad, Electronic Switching System (ESS) and special products at Bangalore and Electronic Digital Switching Equipment at Mankapur and Bangalore.

2. OBJECTIVES

The Company entered into a Memorandum of Understanding (MOU) with the Government of India for 1990-91. The MOU for 1991-92 was signed in December 1991. The objectives envisaged therein are production to full capacity (subject to orders) maintenance of quality and delivery schedules, increase in per capita value addition as well as output, reducing foreign exchange content in products, self reliance, exports and diversification of products and areas.

3. CAPITAL STRUCTURE

In the paid up capital of Rs.88 crores as on 31st March 1992 Govt. of India held shares for Rs.87.69 crores and Govt. of Karnataka for Rs.0.31 crore. Government of India disinvested Rs.17.53 crores of its equity holdings in 1991-92. At the end of 1991-92 Company's long term borrowings stood at Rs.586.70 crores of which Rs.419.03 crores came from bonds issued to public, Rs.57.87 crores from Euro-dollar loans, Rs.81.05 crores from Public Deposits and Rs.28.75 crores from loans taken from Govt. of India.

The reserves and surplus generated by the Company stood at Rs.258.86 crores on 31st March 1992. Capitalised expenditure still to be written off stood at Rs.15.10 crores.

4. DEVELOPMENT & PROJECTS

4.1 The major projects taken up by the Company for their development are indicated below:-

4.2 Telephones at Naini Unit: In August 1970, Rs.7.59 crores was invested for manufacture of telephones at Naini. Capacity was created for manufacture of 2.5 lakhs per annum of one type instead of 5 lakhs of another type approved. The Ministry stated (March 1992) that the increase in cost was due to price escalation and it took over 16 years to complete the project.

4.3 Strowger Switching Equipment at Rae Bareli: Project approved in 1974 was to set up capacity for manufacture of 1 lakh lines of Strowger Switching Equipment by May 1978 at a cost of Rs.16.08 crores. But the Company incurred expenditure of Rs.17.42 crores and set up capacity to manufacture 80,886 lines only by March 1983 because of poor infrastructural facilities at Rae Bareli a green field area. The internal rate of return came down to 13.19 per cent from 16.57.

4.4 Crossbar Capacity at Bangalore: Expansion of Crossbar Capacity from 60,000 lines to 75,000 lines at Bangalore at a cost of Rs.3.05 crores was taken up in May 1979, to be completed by February 1983. The expansion was achieved by May 1989 at a cost of Rs.1.83 crores. But, savings in nickel and silver originally contemplated was not realised because of non-commissioning of the contact welding

machines. But Management stated that consumption of nickel silver in existing machines could not be viewed as excessive.

4.5 ICP Crossbar Equipment at Rae Bareli: Government approved manufacturing facility for 2 lakh lines of electro-mechanical common control ICP Crossbar equipment to be set up at Rae Bareli at a cost of Rs.64.50 crores under foreign collaboration. Nearly all the expenditure was incurred by 1988-89, but capacity of 1 lakh lines only was created in view of the policy to switch over to Digital Switching Equipment. The production from 1982-83 to 1991-92 ranged between 12,154 lines and 86,493 lines per annum only.

4.6 Small Electronic Exchanges and Digital Trunk Automatic Exchanges at Palakkad: Manufacture of 40 line EPABX based on inhouse know-how at a cost of Rs.24 lakhs for 43,000 lines per annum was to be set up. Capital cost of Rs.28.09 lakhs was incurred. Production ranged between 300 and 9680 lines per annum only from 1976-77 to 1980-81. On expansion Rs.98.58 lakhs was incurred but only 23,325 to 33,883 lines per annum were produced from 1981-82 to 1985-86 against estimate of 60,000 lines per annum.

On production of Digital Trunk Automatic Exchanges with foreign collaboration expenditure incurred up to end of March 1992 was Rs.56.39 crores. The details of this project are given in Annexure-I.

Against 3,75,000 lines of DTAX, PABX and RAX equipment to be produced from 1986-87 to 1989-90, only 2,42,863 lines were produced. Management stated (October 1991) that shortfall in production was due to non-approval of capital expenditure between December 1987 to August 1989 by Government. Ministry stated (January 1992) that Company had incurred more expenditure than what was approved which required examination by Government.

The Unit suffered a loss of Rs.2.83 crores from 1986-87 to 1988-89 instead of making profit of Rs.14.39 crores visualised in Feasibility Report because of the excessive capital expenditure.

4.7 E-10B Electronic Switching Systems at Mankapur: A project at a cost of Rs.177.02 crores (including Rs.27.44 crores for providing infrastructure facilities) was taken up (1984) with foreign collaboration for setting it up at Mankapur instead of Bangalore as originally visualised (1982) at a cost of Rs.149 crores for production of 5 lakh lines of digital switching equipment. In March 1990, the project cost went up to Rs.219.36 crores (approved on 27.2.1991) which included Rs.20.15 crores for further infrastructural facilities at Mankapur. The Company incurred extra expenditure of Rs.1.78 crores on flood control and prevention measures.

Production should have been commenced 27 months from the date of commencement of the project and full capacity was to be achieved 60 months thereafter. Due to delays in

execution of project, full capacity was achieved after 92 months as detailed below:-

Phase	Period	Production envisaged		Actual Production (in lines)
		As per FR (in lines)	As revised (in lines)	
P-0	1984-85	28,000	--	--
P-1	1985-86	1,20,000	28,000	28,000
P-2	1986-87	2,20,000	1,20,000	1,12,250
P-3	1987-88	4,00,000	2,20,000	1,74,546
P-4	1988-89	5,00,000	4,00,000	3,41,000
P-5	1989-90	5,00,000	5,00,000	4,56,040
P-6	1990-91	5,00,000	5,00,000	4,48,300
P-7	1991-92	5,00,000	5,00,000	4,73,870

4.8 Rotary and Push Button Electronic Telephones

(i) An in-house rotary telephone developed was tried out and approved by DOT in 1981-82. It was productionised in 1981-82 at Bangalore. But it had been decided earlier (1977) to import new technology for a rotary version of telephone on the ground that for reaching acceptable contemporary levels of quality and long term reliability, it was essential to go in for automated or semi automated manufacture utilising modern technologies and materials. In January 1982, there was also a consensus on introduction of electronic push button telephones.

(ii) Government approved in July 1983 proposal (1981) of the Company for a project for setting up manufacturing capacity for 5 lakh rotary telephones and 7.5 lakh capsules and dials per annum, each at Bangalore and Naini Units at a cost of Rs.18.33 crores with a foreign collaboration with 'F'. The

The collaboration with 'F' for rotary telephones even after the rotary telephone developed inhouse met with the approval of DOT and the plans to switch over to electronic push button telephones in the future foreclosed the options of the Company to choose the best economic alternative for entering into a foreign collaboration agreement.

The Ministry stated (March 1992) that originally the Company decided to have a product mix of Rotary and Electronic Push Button telephone instruments but due to changes in trend of technology, it was decided to switch over from rotary to electronic type later.

4.9 Electronic PABX Equipment at Palakkad Unit: For manufacture of 20,000 ports or lines of EPABX equipment a technology transfer agreement was concluded with C-DOT in March 1986. The Company set up infrastructure and commenced batch production in the last quarter of 1987-88. Out of the 50 exchanges produced upto March 1988 only 15 were sold. Some of the products were upgraded and sold. Production was discontinued in 1988-89.

Management stated (January 1989) that the abandonment of production was due to non-materialisation of orders to the extent of 170 nos., anticipated earlier and stiff competition from later improved versions. C-DOT's know-how was available for the later versions also but Company did not avail of it.

4.10 Second Electronic Switching Systems (ESS) Unit at Bangalore : After the first Electronic Switching Systems factory was decided (November 1982) to be set up in Mankapur, the setting up of a second factory to manufacture 5 lakh lines of Electronic Switching equipment in Bangalore was decided by Government in July 1983 itself. This decision was in view of the likely phasing out of the obsolete Crossbar and Strowger Switching. In 1987 and 1988, it was decided to set up three projects for production of 5 lakh lines of ESS at a cost of Rs.48.65 crores:-

- i) Plant at KEONICS City near Bangalore for 1 lakh lines at a cost of Rs.16.82 crores;
- ii) Plant in Bangalore Complex for 1 lakh lines at a cost of Rs.13.18 crores; and
- iii) Plant at KEONICS City for 3 lakh lines at a cost of Rs.18.65 crores.

Production was to commence in April 1988, January 1988 and October 1989 respectively. The Ministry stated (January 1992) that the reasons for slippage in production was due to delay in giving clearance for design and industrial licence. The full capacity of 5 lakh lines was now expected to be achieved by 1994-95.

UNIT	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Bangalore (*)	26.71	26.16	9.84	3.02	3.78	(27.41)
Naini	16.99	5.84	6.52	3.95	5.24	5.05
Rae Bareli	6.20	8.53	13.27	2.11	2.80	2.37
Palakkad	1.53	(2.26)	(2.27)	11.01	(0.54)	0.03
Mankapur	0.74	(20.87)	(0.29)	14.42	46.41	72.54
Srinagar	0.67	0.87	0.81	(1.02)	(1.70)	(2.90)
Installation & Maintenance	(0.37)	0.01	0.17	0.25	0.08	0.25
E.C. Unit	--	--	(0.09)	1.44	9.50	28.30
Total	52.47	18.28	27.96	35.18	65.57	78.23

* Including Corporate Office.

E.C. = Electronic City

The profits in Bangalore and Rae Bareli Units have gone down during 1989-90 and 1990-91 culminating in a loss in 1991-92 in Bangalore Complex. The profitability of the Company has become very heavily dependent upon the Mankapur unit, disproportionate to the investment there. Production of C-DoT exchange in the Electronic city unit is coming up and yielding profits and may prove to be a second profitable unit.

5.2 PRODUCTION PERFORMANCE

(i) The annual production programme is based on both capacity of machines and order book position. The monitoring of the orders and scheduling of production thereagainst is a combined responsibility of Production Management and Marketing Management. This is appraised in the Chapter on Marketing and Order Management. The

utilisation and Management of capacity for production is appraised herein.

(ii) Capacity in terms of standard production hours depends on availability of manhours and machine hours and there is multiplicity of machines. In the view of the Company, (March 1992) capacity measurement in terms of standard machine or manhours had no relevance in electronic industry. The capacity for products, the targets set and the production achieved in the units in which physical production is measured by the Company are given in Annexure II.

(a) In Bangalore Complex there was shortfall of 72.6 per cent, 41 per cent and 15.9 per cent in the production of C-DOT RAX equipment during the years 1988-89, 1990-91 and 1991-92 respectively, as compared to targets and

(b) the production of telephones was in excess of installed capacity by 11 to 66 per cent which was attributed to labour contributing to higher production.

(iii) Targets and achievements for products manufactured in-house were computed in terms of standard manhours and are given in Annexure-III. Percentage of production to target ranged between 66 per cent to 95 per cent.

(iv) The targets and production of spares in value terms are given in Annexure-IV. Production of Strowger spares exceeded the targets set excepting in 1988-89 and 1991-92. In telephones, transmission and defence production divisions also, the production of spares generally exceeded the targets. The Management stated (May 1989) that the target

targets. The Management stated (May 1989) that the target was only a guideline. Actual manufacture was based on the capacity available for manufacture of the main products. However, achievement in production of main equipments in transmission and telephone Units fell short of targets or capacity in most years as seen from Annexure-II.

(v) In Mankapur unit the capacity for manufacture of Electronic Switching equipment has not been assessed still, though production started in 1986-87 with reference to levels envisaged in Feasibility Reports (Revised projections), production fell short by 20.7 per cent, 14.7 per cent, 8.8 per cent, 10.34 per cent and 5.22 per cent in 1987-88, 1988-89, 1989-90, 1990-91 and 1991-92 respectively. Shortfall was attributed to delay in import of components.

(vi) In Naini Unit for production of VHF systems capacity has not been fixed. The production of MARR systems, exceeded the capacity from 1989-90 and onwards. Production of telephones exceeded installed capacity except in the years 1989-90 and 1991-92. The Management stated (July 1988) that capacity included total manufacturing efforts for telephones including dials, receiver, transmitter and ringer, where transmitters, ringers, and dials were brought from outside, the capacity so released was diverted for manufacturing more telephones.

(vii) In Palakkad Unit, the capacity was 32,500 lines in single shift. The target set in 1984-85 was 26.8 per cent less than the assessed capacity. Still, there were shortfalls in production against targets excepting in 1987-88 and 1989-90. The capacity was expanded to 1,60,000 lines. The Ministry stated (March 1992) that the installed capacity of Palakkad Unit was to be 1,60,000 lines and would increase from 1,60,000 to 2,60,000 lines by 1992-93.

(viii) In Rae Bareli Unit the capacity for production of Strowger and Crossbar Switching equipment have been frozen at 50 per cent of the final capacities envisaged. Machines valued at Rs.3.61 crores were lying surplus. Shortfall in production was attributed to labour unrest and absenteeism.

(ix) In Srinagar Unit the targets fixed were more than the capacity except during 1986-87, 1990-91 and 1991-92 but the targets were not achieved from 1988-89 to 1991-92. The actual production was abnormally low during 1990-91. Shortfall were attributed to non-availability of materials and components, power shortage and quality problems.

(x) Production was not spread out uniformly during the year

as seen from the table below:-

Year	Production in percentage to total		
	In half year ended September	In quarter ending December	In quarter ending March
1986-87	31.5	23.3	45.2
1987-88	34.8	25.8	39.4
1988-89	30.4	19.3	50.3
1989-90	26.3	23.4	50.3
1990-91	29.4	21.1	49.6
1991-92	27.1	20.4	52.5

Even improvement of 10 per cent in the production in the first nine months of the year would speed up the funds flow resulting in a saving of about Rs.3 crores on interest charges apart from the other benefits.

The Management stated (May 1989) that bunching of production in the latter part of the year is a national phenomenon. (in the sense of annual financial, agricultural and festival behaviour pattern cycles). Ministry stated (January 1992) that it had been emphasising the importance of spreading the production uniformly during the year.

(xi) The machine hours available, idle hours and percentage of idle machine hours to available machine hours in Bangalore, Naini, Rae Bareli and Mankapur Units are given in Annexure-V.

The machine utilisation in the Strowger, Crossbar and Telephone Divisions of Bangalore Complex, was 52 per cent to 78 per cent only. Still production in Telephone Division

was in excess of the installed capacity. The underassessment of installed capacity is therefore a possibility and components production being formed out while keeping the in-house capacity idle is also a possibility. Ministry stated (January 1992) that considering the old age of machinery, the utilisation was to be considered normal, thereby confirming the possibility and absence of scientific analysis of viability of inhouse capacity vis-a-vis underassessment.

In other Units at Bangalore, Naini, Rae Bareli and Mankapur (information in respect of Palghat and Srinagar Units was not given), the percentage of idle machine time was high. It was attributed to non-availability of materials, components, tools, operators and orders.

In Bangalore Complex, the Management (January 1992) categorised 195 fully depreciated machines as surplus, and 179 machines were disposed of upto October 1992 for Rs.53.74 lakhs. In Rae Bareli Unit, 121 machines valued at Rs.360.98 lakhs were found surplus for production at level of 90,000 lines of Crossbar equipment. The Ministry stated (January 1992) endeavours to dispose of the machines was being made 35 machines valuing Rs.4.27 lakhs had already been disposed of. Disposal of another lot of 88 machines are under process.

5.3 QUALITY MANAGEMENT

(i) The Company issued two quality manuals at the Corporate level in March 1980 and June 1982. But quality manuals in Naini, Palakkad and Rae Bareli Units were issued only in October 1984, September 1985 and March 1989 respectively. The manuals for Mankapur and Srinagar were issued in January 1992. Earlier quality plans have not been fully implemented in Bangalore, Naini, Rae Bareli and Srinagar Units. Presently, Company was on the first phase of implementation of ISO 9000. Planning for full implementation of ISO 9001 and earning accreditation in 1992-93 had been giving a thrust on 'quality' for the last few years. Management stated (October 1991) that in the last two years it earned "self certification status" from the Department of Telecommunication for five main product lines.

(ii) The following cases of losses of money and image suffered in the past due to failure in Quality Management were noticed in audit.

a) Complaints about plan 103 telephone instruments, resulted in suspension of production from November 1986. Ministry stated in January 1992 that the product was selling well in the market, at present.

b) One Unit did not have a regular primary testing equipment till July 1988, and managed with a simpler Microtronic test system purchased in 1985.

c) Funds to the extent of Rs.182.52 lakhs got locked up entailing a loss of interest of Rs.15.22 lakhs when its products were held up as defective between August 1985 and November 1987. Ministry stated (January 1992) that an attempt was made to economise on capital equipment but later, when found absolutely essential, the test equipment was purchased.

d) In 2 cases, on replacement of failed spark quenchers and varistors and retrofitting of frequency sources Rs.32.70 lakhs was spent and shortages of plan 103 and 104 telephone instruments were experienced as well as loss of order for 1.25 lakh Push Button Passive Telephones because of poor quality control.

e) In July 1985, Quality Assurance Department banned use of some components from two sources in Transmission equipment due to poor quality and reliability. The Naini Unit came to know only after 3 months. The equipment in which these components were used were rejected leading to production loss and replacements.

5.4 MANPOWER MANAGEMENT

(i) The Company employed 30,280 persons as on 31st March 1992. The number of employees was 28,368 in 1983-84. The increase was due to fresh recruitment at Palakkad, Rae Bareli and Mankapur Units which had to be made despite having surplus manpower of around 6000 employees in Bangalore Complex. The policy of transfer of personnel from

one unit to another could not be implemented. The Ministry stated (January 1992) that surplus staff were redeployed after retraining them in new technologies. In the Bangalore Complex under voluntary retirement scheme, only 1717 employees and officers left the Company. Out of surplus labour of 2211 in Crossbar Division at Bangalore 1542 had been redeployed in the Special Products Division (formed in April 1988 to manufacture Electronic Switching and other special products). In Rae Bareli Strowger Division out of surplus manpower of 4000, the expectation is that most of them would be redeployed by 1994-95.

(ii) The manpower strength of 16813 in Bangalore Complex, in March 1989, comprised 7178 persons who were not even matriculates and had no technical qualifications required in the product lines resulting in surplus. In Rae Bareli even though capacity had been frozen at 50 per cent, 85 per cent of manpower required for 100 per cent capacity was recruited upto end of March 1985, resulting in surplus.

(iii) The ratio of indirect employment on production vis-a-vis direct employment was going up in Bangalore and Srinagar. The excess over norm in Bangalore Complex is given below:-

Manpower	Norm	Existing
	(in percentage)	
Direct	70	45
Indirect	10	19
R&D and Engi- neering support	10	11
Services	10	25

(iv) In the number of direct labour hours paid for, the percentage of absentee hours was high and going up in some Units.

	(in lakh hours)					
	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Purchased hours in						
Bangalore	112.60	104.22	88.52	85.47	79.87	78.24
Naini	26.27	26.77	26.21	26.34	25.97	25.85
Palkkad	1.74	2.44	NA	5.39	3.54	4.08
Rae Bareli	40.06	37.82	36.46	35.22	36.60	31.07
Srinagar	1.33	1.47	1.38	NA	1.32	1.13
Mankapur	0.41	7.11	11.61	14.62	16.91	16.76
E.C. Unit	--	NA	NA	0.88	2.04	4.75
Absentee hours in						
Bangalore	19.64 (17.4)	18.68 (17.9)	15.68 (17.7)	11.85 (13.9)	9.94 (12.4)	10.13 (12.9)
Naini	3.15 (11.9)	2.90 (10.8)	3.03 (11.6)	2.94 (11.2)	2.96 (11.4)	2.93 (11.3)
Rae Bareli	6.16 (15.4)	4.90 (12.9)	4.09 (11.2)	4.26 (12.0)	3.88 (10.6)	2.65 (8.5)
Palakkad	0.26 (14.9)	0.56 (23.0)	NA NA	0.71 (13.2)	0.27 (7.6)	0.62 (15.2)
Srinagar	0.17 (12.8)	0.19 (12.9)	0.22 (15.9)	NA	0.27 (20.5)	0.16 (14.2)
Mankapur	0.03 (7.3)	0.70 (9.9)	1.27 (10.9)	1.61 (11.0)	2.10 (12.4)	1.83 (10.9)
E.C. Unit	NA	NA	NA	0.13 (14.8)	0.31 (15.2)	0.52 (11.0)

(Percentage within brackets)

Ministry stated (January 1992) that the level of absentee hours was acceptable, except that in Srinagar Unit, where it was due to law and order situation or severe winter.

(v) The number of production hours after excluding absentee hours, and idle hours is given below:-

(In lakh hours)

	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Hours available net of absentee hours						
Bangalore	92.96	85.54	72.84	70.36	69.93	68.11
Naini	23.12	23.87	23.18	23.40	23.01	22.92
Palakkad	1.45	1.88	NA	4.68	3.27	3.46
Rae Bareli	33.90	32.92	32.37	30.96	32.72	28.42
Srinagar	1.15	1.28	1.16	NA	1.05	0.97
Mankapur	0.38	6.41	10.34	13.01	14.81	14.93
E.C. Unit	--	NA	NA	0.74	1.73	4.23
Idle hours						
Bangalore	12.21	11.57	6.38	5.90	10.92	7.99
Naini	4.64	4.78	4.64	3.51	3.45	3.64
Palakkad	0.10	0.13	NA	0.42	0.29	0.77
Rae Bareli	2.86	2.37	1.30	1.16	1.21	0.77
Srinagar	0.11	0.16	0.13	NA	0.80	0.27
Mankapur	NA	1.94	2.38	0.79	--	NA
E.C. Unit	--	NA	NA	0.07	0.18	0.38
Production Hours						
Bangalore	80.75 (71.7)	73.97 (71.0)	66.56 (75.2)	64.66 (75.7)	59.01 (73.9)	60.12 (76.8)
Naini	18.48 (70.3)	19.09 (71.3)	18.54 (70.7)	19.89 (75.5)	19.56 (75.3)	19.28 (74.6)
Palakkad	1.03 (59.2)	1.36 (55.7)	1.75 (NA)	4.26 (79.0)	2.98 (84.2)	2.69 (65.9)
Rae Bareli	31.04 (77.5)	30.55 (80.8)	31.07 (85.2)	19.8 (56.2)	31.51 (86.1)	27.65 (89.0)
Srinagar	1.04 (78.2)	1.12 (76.2)	1.03 (74.6)	NA	0.52 39.4	0.70 (61.9)
Mankapur	0.38 (92.7)	4.47 (62.9)	7.96 (68.6)	12.22 (83.6)	14.81 (87.6)	NA (NA)
E.C. Unit	-- --	NA (NA)	NA (NA)	0.67 (76.1)	1.47 (72.1)	3.85 (81.1)

(Percentage of production hours to hours paid for within brackets)

The percentage of production hours to hours paid for was quite low. The Ministry stated (January 1992) that the idle time in Naini included try out and inspection time and percentage of production hours would go up if they were not included. But in all divisions of the Company tool try out and Inspection time is treated as non-productive idle time. In Bangalore unit analysis of idle time attributable to a definite cause eg., inspection or recess was done still leaving significant time as inexplicably idle.

(in lakhs hours)

Year	Total idle time	Analysed idle time	Unanalysed idle time	%age of un- analysed idle time to total idle time
1986-87	12.21	6.89	5.32	43.6
1987-88	11.57	7.74	3.83	33.1
1988-89	6.38	3.45	2.93	45.9
1989-90	5.90	2.03	3.87	65.6
1990-91	10.92	3.74	7.18	65.8
1991-92	7.99	7.99	NIL	NIL

The Ministry stated (January 1992) that the idle time at Bangalore Complex was recorded against about 200 causes but only major groups were analysed.

(vi) Some of the reasons for idle time were 'want of components and materials, cleaning of machines, want of shop orders, mechanical and electrical breakdown, want of tools, methods and try out, power failure and welfare, indicating that many of them were result of management failure in controlling the causes. The number of such avoidable idle

hours and their percentage to total hours paid for is given below:-

	(in lakh hours)					
	Avoidable idle hours					
	(Percentage to hours paid for in brackets)					
	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Bangalore	4.53 (4.0)	4.06 (3.9)	1.56 (1.8)	2.03 (2.4)	2.26 (2.8)	NIL
Naini	3.27 (12.4)	3.28 (12.3)	3.17 (12.1)	2.07 (7.9)	3.45 (13.3)	3.64 (14.8)
Palakkad	0.03 (1.7)	0.05 (2.0)	NA (NA)	0.41 (7.6)	NA (NA)	NIL
Rae Bareli	1.00 (2.5)	1.36 (3.6)	0.61 (1.7)	0.40 (1.1)	1.21 (3.3)	0.77 (2.5)
Srinagar	0.01 (0.8)	NA (NA)	NA (NA)	NA (NA)	NA (NA)	NIL

(vii) Labour productivity was computed as percentage of standard hours required for the jobs to actual hours paid for and the figures are given below:-

Labour Productivity

	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Bangalore	83.01	75.00	74.85	67.33	65.92	60.86
Naini	77.39	79.57	86.15	86.75	88.45	86.11
Palakkad	62.64	53.69	NA	82.93	75.14	79.41
Rae Bareli	58.76	69.91	81.65	77.60	78.47	85.10
Srinagar	84.21	75.51	75.36	NA	NA	NA
Mankapur	68.29	55.84	56.50	58.28	70.85	81.56
E.C. Unit	--	NA	NA	44.32	73.05	90.74

The labour productivity in Rae Bareli Unit was low during 1986-87 compared to the other units. Management stated (December 1988) that this was attributable to the low learning curve in Rae Bareli. In Mankapur the productivity was low in the year 1986-87 to 1990-91. In Bangalore it was coming down.

5.5 MATERIALS MANAGEMENT

(i) The inventory levels in the Company in recent years is given below:-

(Rupees in lakhs)

Particulars	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
a) Raw materials and stores	10096	15126	28155	29239	24472	22250
b) Raw materials with fabricators	13	25	21	417	213	259
c) Non-production stores in stock	1271	1412	1373	1275	1299	1301
d) Tools and gauges in stock	660	594	231	460	311	334
e) Materials in transit	4895	6042	8037	12330	5942	6503
f) Work-in-progress	3997	6439	11373	15841	17239	22341
g) Finished goods in stock	2824	3812	11026	11936	11009	11283
	23756	33450	60216	71498	60485	64271

(ii) The holding vis-a-vis norms is given below:-

	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
1. Raw materials in months of consumption	6.8	8.7	12.3	8.2	6.2	6.3
(Norm: 1 to 6 months)						
2. Non-production stores(in months of consumption)	10.0	8.3	6.9	8.1	7.8	--
(Norm not fixed)						
3. Work-in- progress(in months of production)	1.2	1.5	1.8	1.1	2.1	2.3
(Norm:1.5 months)						
4. Finished goods (in months of sales)	0.8	0.9	1.9	1.5	1.3	1.3
(Norm:0.5 months)						
5. Total inven- tory as a percentage of sales	54%	66%	96%	75%	62%	59%
(Norm:50%)						

(iii) Unitwise excess in inventories over norms are given below:-

(Rs. in lakhs)

Unit	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Bangalore	2600	4164	620	7404	7126	527
Naini	1214	2412	2813	3128	2900	2773
Palakkad	1412	1690	3518	2189	1459	2506
Rae Bareli	2267	2100	2316	3277	2504	674
Srinagar	25	11	--	--	47	NA
Mankapur			13954	6671	3696	4907
	-----	-----	-----	-----	-----	-----
	7518	10377	23221	22669	17732	11387

Management attributed (October 1988) excesses to the need to supply by due dates. This however is not borne out by the findings in Marketing Management dealt with in a subsequent chapter.

(iv) Non-moving items and slow moving items in the inventory in various units are given below:-

(Rs. in lakhs)

Unit	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Bangalore	513	428	398	150	73	337
Palakkad	25	33	20	-	-	NA
Rae Bareli	175	135	70	21	160	133
Naini	161	63	188	29	12	382
Mankapur	NA	NA	NA	133	180	NIL
Srinagar	NA	NA	1	1	1	1
	---	---	-----	-----	-----	-----
Total	874	659	677	334	426	853

Raw materials of the 'C' class (representing 70 per cent of the items by number and forming about 10 per cent by value), held in different units of the Company accounted for the excessive accumulation. It was high in Bangalore, Naini

and Rae Bareli. The Management stated that guidelines for control and maintenance of 'C' class items have been included in the new purchase manual. It was being redrafted on introduction of ISO 9001.

(v) Excesses and shortages noticed during physical verification of inventories amounted to excess of Rs.269.50 lakhs at the end of March 1992.

(vi) Material rejected during Inspection had accumulated by the unit and at the end of March 1992 valued Rs.211.29 lakhs in Bangalore and Rs.229.44 lakhs in Rae Bareli and Rs.158.88 lakhs at Mankapur at the end of March 1991.

5.6 RESEARCH AND DEVELOPMENT MANAGEMENT

(i) The Company has set up Research and Development divisions at Bangalore in 1952, at Naini in 1972, at Rae Bareli in 1989 and at Mankapur in 1990.

(ii) In 1948 know-how came from collaborators and was limited to knowledge of manufacture of Automatic Exchanges using Strowger Switching system. It was transferred from Bangalore to Rae Bareli. Know-how for producing Desk 332 type telephone came from abroad and further models developed inhouse. Technology for Crossbar Switching Equipments was imported in 1964 but system ICP was developed, and was produced in Rae Bareli Unit.

Other systems developed included 16 transmission systems. The value of production of own developed systems

and products accounted for 60 per cent of value of production during 1987-88 and 1988-89.

(iii) The Telecommunications Research Centre (TRC) is a wing of the DOT. From September 1988, TRC limited itself to R&D functions and engineering support was entrusted to a newly formed society called Telecommunication Centre which was under the DOT. In August 1984, a Centre for Development of Telematics (C-DOT) had been set up also as a registered society fully funded by Government. In August 1989, the R&D functions of TRC were taken over by C-DOT which came under the Telecommunications Commission of DOT. The Ministry stated (January 1992) that product development and engineering was entrusted to the Company's R&D, while system engineering and technical development was entrusted to Telecommunications Research Centre under DOT.

(iv) Out of 185 R&D projects taken up by the Company from 1975-76 to 1989-90, 17 were completed at a cost of Rs.3.58 crores but were not productionised for want of orders or import of foreign technology. On 82 projects Rs.6.82 crores were spent but they were abandoned or short closed between 1980-81 and 1989-90 consequent to acquisition of foreign technology, unlikelyhood of orders, unsatisfactory performance, or lack of infrastructure in the Company.

(v) Expenditure on R&D projects undertaken by the Company at the instance of TRC were reimbursed by the DOT upto 31.3.1989.

(vi) The progressive expenditure on R&D in two units upto end of 31.3.1992 is given below:-

(Rs. in lakhs)

	Bangalore Unit	Naini Unit	Total
Capital Expenditure	4024.64	1253.63	5278.27
Revenue Expenditure	23469.97	4232.16	27702.13
Staff engaged on R&D as on 31.3.1992 (Nos.)			
-Officers/Engineers	693	109	
-Non-Officers/Non- Engineers)	523	279	
	----	---	
	1216	388	

The nature of the R&D projects and expenditure thereon in recent years yearwise in Bangalore Complex are given below:-

(Rs.in crores)

Year	Gross R&D Expenditure	Expenditure related to		
		Production activities (%age to gross expenditure in brackets)	Projects for DOT	Other Projects
1986-87	22.29	9.41 (42.2)	6.02	6.86
1987-88	28.28	13.71 (48.5)	6.56	8.01
1988-89	30.61	19.38 (63.31)	2.98	8.25
1989-90	25.12	12.99 (51.71)	2.35	9.78
1990-91	27.18	13.46 (49.52)	2.22	11.50
1991-92	24.26	10.57 (43.57)	5.71	7.98

6. MARKETING, PRICING AND COST CONTROL

6.1 The customer composition of sales in recent years is given below:-

(Rupees in crores)

	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Govt. Departments						
DOT	390.84	454.04	550.46	880.51	913.15	901.21
Non-DOT	33.92	38.80	57.92	42.01	49.49	72.02
	-----	-----	-----	-----	-----	-----
Total	424.76	492.84	608.38	922.52	962.64	973.23
	-----	-----	-----	-----	-----	-----
Public Sector						
Undertakings	7.26	6.16	7.85	32.58	13.60	110.50
Exports	0.53	0.35	0.32	0.27	0.30	0.97
Others	8.15	9.13	8.63	3.38	1.92	--
	-----	-----	-----	-----	-----	-----
	440.70	508.48	625.18	958.75	978.46	1084.70

Till March 1985, the Company which was the only one major producer in the country for most equipment in the telecommunication sector enjoyed a captive market, with most of its sales, going to the Department of Telecommunications. Thereafter under the change in Industrial Policy Telephone Instruments, small exchanges, PCM system microwave and UHF systems, FDM Multiplex, Multi-access Radio, Telemetry, Tele-control systems and turnkey jobs became open to others who gave competition to the Company. From around 1991-92 the Company has to compete with many others who have entered the market and possess know-how in the state-of-the-art technology. Competition is on both price and quality fronts. The Company's sales to non-DOT customers came down

from 11.3 percent of the total sales in 1986-87 to 6.7 percent in 1990-91 and went upto 16.9 per cent in 1991-92. Ministry was of the view that control of cost was necessary to make the Company's prices competitive. Otherwise the Company was unlikely to secure sizeable orders, as in the past.

6.2 Price Agreements with DOT

Earlier, under a pricing agreement, from 1980, Company received on orders from the Department of Telecommunications(DOT) a profit margin based on a normative return on net worth after allowing the standard cost of production. From April 1986, a new agreement became effective for three years. After March 1989, no fresh agreement was reached but the price as per earlier agreement is being allowed on the subsequent supplies. On escalation over standard cost ad-hoc amounts were allowed. Due to non-computation of itemised standard costs, itemised prices including the margin were not prepared from 1.4.1980 upto 31.3.1986 in Bangalore, Naini and Srinagar Units and from 1.4.1983 in Rae Bareli Unit. Therefore, the practice of adopting a "condensed method" came to be followed. A summary factor allowing for escalations was applied on itemised price lists as on 1.4.1979 or 1.4.1982. On supplies from the year 1986-87 itemised price lists were again prepared. The agreement effective from April 1986, interalia, provided for payment with the purchase order of

advance at 35% (which was revised to 45% with effect from 1st April 1989) of the supplies to be made in the first 12 months from the purchase order. The Company received advances on 26 purchase orders amounting to Rs.38.01 crores after delays of 15 to 925 days. The reasons for the delay were given as non-availability of technical and commercial clarifications from customer, non-availability of rates in respect of certain equipments and non-fixation of delivery schedules which carried penalty of liquidated damages for delay. Liquidated damages for delays were subject to a maximum of 5% of the value. According to the Company, in reality, the clause on advances had never been implemented by DOT. The Ministry stated (November 1991) that, Company did not claim the advance. In some cases claims were made by Company and accepted by DOT. The Ministry also stated that if the advance remained unadjusted beyond the original delivery schedule, the Company would have to pay commercial rate of interest. Company, however, paid interest of Rs.3.54 crores on cash credit obtained from bank because of the non-claiming of advance in the 26 cases.

The Company had to pay liquidated damages amounting to Rs.49.35 crores on supplies made during the years 1987-88 to 1990-91. Ministry refuted (January 1992) the Company's view that DOT was recovering liquidated damages irrespective of the delivery lead time. It was levied only on purchase orders where delivery conditions had been accepted by the

Company. In most cases the Company had also accepted advances.

Rs.20.15 crores were disallowed by DOT on supplies made upto 1986-87 under the old pricing agreement upto 31st March, 1988 because of failure in sequence of supplies. On supplies from 1987-88 onwards the Company was barred from preferring bills till the sequence of supplies was completed. Upto end of 1991-92 Rs.137.11 crores could not be billed by Company for this reason in Bangalore Complex.

6.3 On items supplied to non-DOT customers, the Company was adding a percentage towards R&D expenditure, escalation at 10 per cent per annum and profit margin of 20 per cent, to the itemised cost. For non-DOT items the price was fixed based on Engineers' estimate of cost adding cost of contingencies and profit margin decided by Management. This was because the Company was quoting against competitive bids and the other method of price fixation was not valid. Ministry stated (Jan. 1992) that the prices adopted varied and took into account the competition and cost structure. In the case of supplies to DOT continuously for long time there was no provision for escalation assuming the delivery schedules were less than 12 months.

6.4 Diversification

In June 1985, Government advised the Company that "it was high time, it went for diversification, unless it widens

its market range beyond supplies to DOT, it would be difficult for the Company to expand". Management stated (October 1991) that Company had diversified into informatics area and there was vast scope in the development of telecommunications. Diversification into other than telecommunication areas was not appropriate. The following diversification schemes had been taken up since 1985-86:-

i) Special Product Division at Bangalore - manufacture of C-DOT, RAX, ESAX, ILT , MILT, Key phones, Piece parts and Antennae and ILT, MILT and Power Plant at Rae Bareli.

ii) Micro Electronic Division, Bangalore - manufacture of thick film, thin film and LSI/VLSI.

iii) Rae Bareli Unit: manufacture of RTS, 3 Channel open wire system, Master Clock, and Piece parts for Mankapur Unit.

Ministry stated (January 1992) that further plans were on hand to diversify into MDF, Power Plant, Antennae, AC/DC Convertors, critical components and PCB. These would cater mainly to DOT.

6.5 Exports and Import Substitution

Exports were negligible highest being Rs.53 lakhs in 1986-87 i.e., about 0.5 per cent of the sales. Ministry stated (1992) that efforts involved in export were not commensurate with results, unless suitable assistance was given by the Government. There was great potential for

exporting Telephone instruments, small capacity Rural Telephone Exchange and PCM equipments. The objective was to export telecom products worth Rs.500 crores by the end of the eighth five year plan.

The Company had been pressing DOT for placement of orders to utilise capacity for production of electro-mechanical Strowger and Crossbar equipment at Bangalore and Rae Bareli Units. In November 1986, the Company understood that DOT was importing equipment.

The Management stated (November 1988) that there was reduced requirement in DOT for electro-mechanical switching equipment. Import was for electronic switching systems. But imports of electro-mechanical switching equipment had taken place as per the reports made to the Board of the Company in November 1986. The Company did not also furnish details of "no objection certificate", given by it for imports by DOT to enable verification by audit of the reasons for such imports.

Public Accounts Committee in their 19th Report (1990-91) commented on the import of 3.04 lakh lines of Crossbar exchange equipments in the year 1980-84 and incurring of extra expenditure of Rs.12.64 crores on the import of 1.7 lakhs lines by DOT. Information on imports in the subsequent years was not made available to Audit.

6.6 Marketing and Order Management

The sales targets and achievement in recent years are given below:-

(Rupees in crores)						
Unit	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Bangalore						
- Target	176.39	176.58	245.23	373.79	437.36	250.79
- Achievement	186.61	211.49	239.45	290.64	295.50	310.04
			(2.4)	(22.2)	(32.4)	--
Naini						
- Target	64.06	69.67	86.70	162.85	132.82	179.04
- Achievement	73.76	67.96	91.83	122.55	141.38	173.20
		(2.45)		(24.75)		(3.26)
Rae Bareli						
- Target	67.61	75.79	106.11	126.66	109.06	161.33
- Achievement	68.40	82.25	99.80	95.22	101.00	128.88
			(5.9)	(24.8)	(7.4)	(20.11)
Palakkad						
- Target	33.70	38.98	65.26	66.77	111.13	74.57
- Achievement	12.10	27.32	50.74	102.09	61.40	86.89
	(64.1)	(29.9)	(22.2)		(44.7)	--
Srinagar						
- Target	5.42	8.37	9.68	12.00	14.87	3.14
- Achievement	7.78	8.91	10.34	7.56	3.06	1.14
				(37.0)	(79.4)	(63.69)
Mankapur						
- Target	111.12	182.98	358.65	350.00	351.49	388.48
- Achievement	91.96	110.06	132.10	334.82	342.46	300.60
	(17.2)	(39.8)	(63.2)	(4.3)	(2.6)	(22.62)
I&M Unit						
- Target	--	15.73	29.06	34.28	40.06	NIL
- Achievement	0.09	0.49	0.84	0.90	1.93	5.18
		(96.9)	(97.1)	(97.4)	(95.2)	--
E.C.Unit						
- Target	--	--	12.74	20.4	80.72	67.45
- Achievement	--	--	0.08	4.97	31.49	78.77
			(99.4)	(75.6)	(61.0)	--
Company as a whole						
- Target	458.66	568.10	913.43	1097.44	1270.78	921.78
- Achievement	440.70	508.48	625.18	958.75	978.46	1084.70
	(3.9)	(10.5)	(31.6)	(12.6)	(23.0)	--

Note: Figures in bracket indicate percentage of shortfall in achievement.

The shortfall in sales achievement for the Company as a whole ranged between 4 and 32 per cent of the targets during the period 1986-87 to 1990-91. However, it was 63 per cent

in Mankapur and 22.2 per cent in Palakkad during 1988-89. Shortfall was more than 95 per cent in the four years from 1987-88 in Installation & Maintenance Unit, and during 1988-89 in E.C.Unit. The shortfall was persisting in these units till 1990-91. According to Management (October 1991), the shortfall was attributable to inability to procure raw material and components in time. But it was seen that for many items there was shortfall in orders vis-a-vis planned production i.e., failure to generate orders as seen from details in Annexure VI. The allocation of orders to various units was done by the Corporate Office but information on pending orders in the various units, was not obtained in Corporate Office to regulate allocation of orders. At the unit level also the information was not available. The monitoring of order management in marketing side was very poor.

Management stated (June 1989 and October 1991) that the break up of orders was being collected separately and monitoring at Corporate level was not done, in view of the large number of orders for a variety of equipment.

6.7 Failure of Marketing Management to Schedule Production:

A. Orders from DOT:

(i) The commitments made to DOT and the supplies actually made in recent years are given in Annexure VII, to the extent made available by Company. In many cases there were shortfalls (particularly from Naini Unit) or excess supplies both of which affected plans and sequence disciplines

stipulated by the DOT. In supply of transmission equipment, there were mismatches between different parts and systems supplied from Bangalore and Naini Units. They affected commissioning of telephone exchanges and transmission lines by DOT. There was no monitoring by the Marketing Management.

(ii) Due to shortfalls in supplies from Rae Bareli, Bangalore and Mankapur Units, 102 Strowger exchanges of 63,400 lines, 15 Penta Conta Crossbar exchanges of 31,100 lines, 13 ICP Crossbar Exchanges of 19,000 lines and 4 Electronic Exchanges of 38,000 lines commissioning due in 1983-84, 1986-87 and 1987-88 had to be delayed to the subsequent years. There was no monitoring by the Marketing Management.

(iii) Shortfalls in supplies from Bangalore Complex in respect of 1252 exchanges covering 79,780 lines (MAX II, MAX III traffic relief, STD/SLOD and auto telex equipment) committed upto 1984-85 and in respect of 109 exchanges of 130684 lines (Local Exchanges, Trunk Auto Exchanges, Digital and Local TDM exchanges and traffic relief/junction equipment) for supply in 1983-84 to 1985-86 also affected plans of DOT. There was no monitoring of production by Marketing Management to ensure customer satisfaction.

(iv) Defective spark quenchers and varisters supplied by Bangalore Unit affected the functioning of many crossbar exchanges and entailed burden of Rs.23.50 lakhs on Company

on free replacements. There was no monitoring by Marketing Management over production and quality control.

(v) There were slippages and imbalances in the supply of almost all major equipments viz., Microwave, Co-axial, PCM, Open Wire System Video Co-axial links, Multiaccess Rural Radio Systems, MUX equipment, Interstice Systems and Single Channel UHF Equipment. Supplies were as low as 3 per cent to 14 per cent in some cases and the time required to overtake the backlog in Naini Unit is 6 to 7 years. In production of Open Wire Carrier Systems there was heavy backlogs in orders of 1986-87 and earlier years in Naini Unit despite utilisation of capacity. The slippages affected switch over to digital versions by DOT in June 1985 and also the plan of the Company to phase out analog equipment from 1986-87. There was no monitoring by Marketing Management over production units.

(vi) There were heavy slippages in the supplies of Telephone instruments (Plan 103 and Plan 104) by Bangalore Complex and complaints on their performance and consequent suspension of supplies from November 1986. There was backlog of 40,000 Nos. in supply of Electronic Telephone Instruments committed for supply during 1985-86. There was no monitoring by Marketing Management.

(vii) Due to inordinate delays in supplies of Strowger, Crossbar, Transmission, DTAX, TAX and Auto Telex equipment by the Company to DOT as well as, defects in equipment supplied, loss of revenue to DOT was Rs.24.51 crores and

import of equipment valued at Rs.0.63 crore had to be made by the DOT. There was no monitoring by Marketing Management.

(viii) Management stated (October 1991) that orders placed by DOT lacked sufficient details and gave insufficient lead time. Delays in getting import licence was also a reason for delay by Company. Ministry stated (March 1992) that supplies of equipments and submission of bills by Company was quite uneven and delay in granting import licences was due to the Company not furnishing sufficient details. The approach of Company confirm failure to develop a Marketing Management to schedule production to achieve customer satisfaction and improve control over order management.

B. Orders from Defence

Upto May 1985, the Transmission Division of Bangalore Complex was producing and supplying equipment for Defence also. A Defence Production Division was formed in Bangalore Complex carved out of the Transmission Division. Orders received and supplies made between June 1985 and March 1992 are given below :-

(Rs. in lakhs)

Particulars	June 1985 to Mar. 1986	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
1.Orders on hand at beginning of the period/ year	7646	8087	6671	6684	5521	4569	5345
2.Order received- during the year/ period	1635	1052	1888	1533	1774	4957	1530
3.Total Orders (1+2)	9281	9139	8559	8217	7295	9526	6875
4.Orders cancelled during the period/ year	77 (March, 1986)	1030 (November, 1988)	NIL	NIL	NIL	306	NIL
5.Net orders (3-4)	9204	8109	8559	8217	7295	9220	6875
6.Supplies made during the period/ year	1117	1438	1875	2696	2726	3875	3731
7.Closing balance of orders at the end of the period/ year	8087 -----	6671 -----	6684 -----	5521 -----	4569 -----	5345 -----	3144
8.No. of years sales represented- by the closing balance (7)	7.2	4.6	3.6	2.0	1.7	1.4	0.8

The reasons for the heavy backlogs in making supplies, and for accumulation of orders at the end of years 1985-86 to 1989-90 were not made available despite request by Audit.

On the slippages in supplies, the Company paid liquidated damages amounting to Rs.68.74 lakhs to the Defence during the years 1983-84 to 1989-90.

6.8 Absence of Marketing Approach for Customer Satisfaction in Supply of Spares

There were considerable delays in supply of all categories of spares by the Company to its customers.

The Management stated (May 1989) that DOT's demand for spares had increased and exceeded the capacity with Company for production of spares. Arrangements were being made to increase supply of spares and position of supply of critical spares would improve.

6.9 Sundry Debts

The Sundry Debts vis-a-vis sales in recent years are given below:-

(Rs. in crores)

Year	Sales	Sundry Debts	Debts considered doubtful	Percentage of Sundry debts to sales	No. of months sales represented by Sundry Debts
1986-87	440.70	409.69	6.47	92.9	11.2
1987-88	508.48	456.29	8.48	89.7	10.8
1988-89	625.18	496.95	7.12	79.5	9.5
1989-90	958.75	600.49	0.56	62.6	7.5
1990-91	978.46	651.76	0.91	66.6	8.0
1991-92	1084.70	782.12	1.26	72.1	8.6

The reasons for such heavy accumulation of Sundry Debts vis-a-vis sales were understood to be:

- (i) Non-payment by DOT.
- (ii) Non-submission of bills by Company.
- (iii) Objection raised on bills by DOT.
- (iv) Inadequacy in billing, despatch to wrong consignees and clerical errors in Company.
- (v) Delay in approving rates for billing.
- (vi) Delay in agreement on adhoc escalations to be claimed.

The Ministry stated (March 1992) that the Company sent heavy bills at the end of the year and gave insufficient time to DOT to check them. Also if the supplies were evenly spread during the year and billing was evenly made by the Company during the year the problems could be avoided.

6.10 Cost Control

(i) For the purpose of costing, standard costs are adopted based on (a) standard quantities of raw materials as per the process sheets, (b) standard labour hours as fixed by Industrial Engineering Department and (c) overheads as a fixed percentage of direct labour cost. The differences between the actual costs and standard cost estimates are booked to a "cost variation adjustment account", and variations analysed.

Management stated (November 1988) that under the existing system, the ascertainment of actual cost was

possible only after closure of each shop order. Value of manufactured components at standard cost and value of purchased components get merged in the stores and both are drawn for further production against shop orders and the actual cost of the final saleable unit varies because of this also. Therefore, updated standard costs come nearer "actual" costs which should ideally be the basis for pricing. Also, overall variations from standards were not significantly high.

(ii) A computer statement generation of excess material (above the value of Rs.5000) over standard drawn against shop-orders was being reviewed by production managers and will be sent to Finance Division also for review. The computerised data showed excess in several cases but no action was taken despite output varying from quantity for which shop indented for material. Illustrative cases are given in Annexure VIII.

(iii) For costing rejections and cost of re-work only instructions were issued (December 1991) for introducing a suitable and effective system but little progress had been made to adjust variation between actuals and standard and update standards. Similarly as variations between standard and actual overhead costs which show significant variations of (-) 169 to (+) 151 per cent in various units, suitable adjustment in standards were not being made with consequential distortions in pricing.

The Management also stated (November 1988) that overhead expenditure to a large extent was of fixed nature and per unit overheads cost depended greatly on production volume which varied. Under the new Pricing Agreement (of 1987) overhead and profit was limited to 20% of landed cost of SKD/CKD in case of assembly and delivery, which did not cover such costs in Palakkad Unit.

(iv) Transfer of materials between shops is not intimated to the costing or planning department with the result that shop orders disclosed incorrect cost.

(v) Costing for gold used

(a) The consumption of gold vis-a-vis the norm fixed for its consumption in recent years is given below:-

(Quantity in grams)

Year	To be used as per norms	Actual consumption	Excess/ Saving (-)
1986-87	5579.11	6182.28	603.17
1987-88	3152.45	4337.62	1185.17
1988-89	4816.19	6136.89	1320.70
1989-90	4772.56	4034.29	(-)738.27
1990-91	5347.84	5584.81	236.97
1991-92	6877.09	5168.68	(-)1708.41

On the excess of 3346.01 grams of gold upto 1990-91, the Management stated (June 1992) that the difference included quantity transferred to other Divisions (1030.01), gone into solution and still to be recovered (200); quantity recovered, assayed and deposited (96) quantity recovered from gold plating solution (50). The balance excess of

1231.73 grams, was attributed by the Management to the failure to maintain the specified thickness in plating on wires and gigs i.e., to assumed overissue compared to amount for which cost estimates included for cost of gold for pricing.

(b) On the rejected gold plated components that had accumulated in Bangalore Complex, the Management stated (June 1989) that they were kept under safe custody but shopwise data was not readily available. The Ministry stated (January 1992) that a Committee was constituted for looking into the subject and draft a manual.

(c) In Naini Unit, Gold Potassium Cyanide is used for Gold Plating parts of Printed Circuit Boards. Rejection of gold plated printed circuit boards ranged between 10 and 15 per cent. The Company retrieved 6.65 gms of gold out of 500 rejected cut cards against a theoretical maximum recovery of 20 gms.

(d) Precious metals such as silver, palladium and platinum in the form of wires or contacts are used for contact welding of certain types of spring bars in Strowger and Crossbar equipment. No time limit was prescribed for the return of the excess materials drawn and they were returned on closure of shop orders. But they are returned only after collection of end pieces of 500 to 1000 gms. The Chief Superintendent of shop is required to make out a precious

metals balance taking scrap into account with 15 per cent allowance. Such balance was not on record.

N. Sivasubramanian

(N.SIVASUBRAMANIAN)

Deputy Comptroller and Auditor General
-cum-Chairman, Audit Board

New Delhi
The

31 MAR 1993

Countersigned



(C.G. SOMIAH)

Comptroller and Auditor General of India

New Delhi

The

31 MAR 1993

ANNEXURE-I (Referred to in Para 4.6)

Palakkad Project

P H A S E	Feasibility Report	Approval	Equipment covered	Year	Production per annum		Capital Cost	
					Projected (lines in double shift)	Actuals (lines)	Estimated	Actuals
							(Rupees in lakhs)	
III	November 1980	March 1981 (Govt.)	Digital Trunk Automatic Exchanges under foreign collaboration (60000 lines) and Digital Rural Automatic Exchange (50000 lines) and Digital PABX and PAX (40000 lines) of in - house R&D design.	1986-87	-DTAX 21000 -PABX 15000 -RAX 15000	3421 8800 950		1595.00
	September 1982	July 1983 (Govt.)	- do -	1987-88	-DTAX 60000 -PABX 25000 -RAX 30000	12893 19550 15400		3372.00
	April 1986	Not received	DTAX under foreign collaboration	1988-89	-DTAX 60000 -PABX 37500 -RAX 50000	25339 14200 8000		6195.00
	September 1987 (Revised Estimates)	Not received	- do -	-do-	-do-	-do-		6758.00
								5639.00 (Upto March 1992)

In addition, the Unit produced EPABX (Phase II equipment) in the Phase III period also utilising the capacity already created in 1986-87, 1987-88 and 1988-89.

ANNEXURE - II (Referred to in para 5.2(ii))
Installed capacity, production (with target in brackets).

Particulars	Installed Capacity	Unit of Measurement	1986-87 Production (& Target)	1987-88 Production (& Target)	1988-89 Production (& Target)	1989-90 Production (& Target)	1990-91 Production (& Target)	1991-92 Production (& Target)
1	2	3	4	5	6	7	8	9
STROWGER								
Bangalore	150000	Equivalent lines	115675 (115000)	95885 (90000)	132347 (90000)	98305 (88700)	Phased out from 1.4.1990	NIL (NIL)
Rae Bareli	50000	"	50850 (55000)	58353 (50000)	80886 (77775)	77470 (75000)	85787 (70000)	39235 (30000)
Total	200000	"	166525 (170000)	154238 (140000)	213233 (167775)	175775 (163700)	85787 (70000)	39235 (30000)
CROSSBAR								
Bangalore	60000	"	42545 (35000)	30824 (30200)	Phased	out since	1.4.1988	NIL (NIL)
Rae Bareli	100000	"	46500 (60000)	67100 (45000)	86493 (75000)	63486 (57000)	57878 (60000)	55165 (60000)
Total	160000	"	89045 (95000)	97924 (75200)	86493 (75000)	63486 (57000)	57878 (60000)	55165 (60000)
ELECTRONIC (C-DOT RAX)								
Palakkad	Expansion of capacity to 160000 in project stage	"	55026 (71750)	85026 (85000)	74508 (100000)	90676 (80000)	132570 (152600)	71400 (105300)

Mankapur	Project stage	"	1190000 (120000)	174546 (190000)	341000 (345000)	456040 (500000)	448300 (500000)	473870 (500000)
Bangalore	Project stage	"	-	-	9600 (35000)	34700 (31000)	61432 (104000)	150000 (178300)
Total			174026 (191750)	259572 (275000)	425108 (480000)	581416 (611000)	642302 (756600)	695270 (783600)
SPECIAL PROJECTS								
Bangalore not fixed		"	-	-	-	-	-	-
4 Items		"	-	-	32868 (NIL)	83980 (80000)	157040 (171000)	NA (NA)
7 items		Nos./Systems	-	-	94 (821)	-	-	NA (NA)
11 items		Rs. in lakhs	-	-	510 (410)	-	-	NA (NA)
TELEPHONES								
Bangalore	275000	Numbers	306636 (400000)	360348 (360000)	456069 (400000)	356015 (350000)	372586 (500000)	311800 (459000)
Naini	250000	"	320000 (300000)	276439 (300000)	351351 (300000)	233084 (420000)	362515 (400000)	181600 (450000)
Srinagar	100000	"	125286 (100000)	140055 (140000)	140130 (150000)	100000 (150000)	42725 (100000)	24000 (50000)
Total	625000	"	751922 (800000)	776842 (800000)	947550 (850000)	689099 (700000)	777826 (1000000)	517400 (959000)
TRANSMISSION								
Bangalore								
1. Microwave Radio Equipment	2000	KMS	440 (1600)	2000 (2280)	3640 (3940)	2660 (NA)	3750 (NA)	76 (NA)

2. Co-axial Equipment	1650 upto 1987-88 2000 from 1988-89	Route KMS	1620 (1220)	588 (848)	872 (650)	1252 (NA)	2768 (NA)	27 (NA)
3. Multiplexing Equipment Bays	1200	Numbers	1090 (991)	314 (450)	402 (449)	241 (NA)	240 (NA)	2356 (NA)
4. Groups	2200 Upto 1987-88 3000 from 1988-89	Numbers	1620 (1220)	588 (848)	872 (650)	1252 (NA)	2768 (NA)	
5. Inter- stice Equip- ment Bays	100	"	55 (57)	NIL (58)	30 (63)	187 (NA)	36 (250)	153 (NA)
6. Groups	250	"	215 (287)	NIL (274)	70 (NA)	336 (NA)	168 (1052)	768 (NA)
7. VFT Channel	3000	"	3772 (NA)	5660 (NA)	6228 (NA)	6877 (NA)	6204 (NA)	239 (NA)
8. Field Telephones	7000 Upto 1987-88 10000 from 1988-89	"	NIL (NIL)	4218 (6000)	6000 (6000)	1387 (5000)	3032 (5000)	4443 (NA)
9. Defence & Misc. Equipment	1200 Rs. in lakhs		1560 (NA)	1720 (NA)	1150 (NA)	1095 (1238)	858 (1317)	551 (NA)
10. PCM (Primary MUX)	4000 System from 1988-89		-	160 (NA)	616 (600)	920 (800)	408 (122)	NA (NA)
11. Satcom	50 LNA From 1988-89		-	28 (NIL)	23 (NIL)	44 (24)	35 (47)	NA (NA)

TRANSMISSION

Naini

1. Co-axial 30 line equip- ment	RKM	9 (27)	9 (45)	36 (NIL)	NIL (45)	63 (45)	NA (NA)
2. FDM-MUX 20000 Equipment	Chl-ends	11340 (10200)	9144 (18000)	15912 (12000)	23178 (15960)	12456 (19800)	2319 (1975)
3. Open-wire 1200 carrier system	Chis	1129 (1160)	1147 (1499)	1198 (1050)	2453 (4200)	3199 (3465)	1884 (1640)
4. PCM 3000 Systems	Chis	3000 (3000)	1260 (6450)	13020 (15000)	16650 (15000)	18370 (3000)	692 (700)
5. Level 150 Measuring Set-ups	Numbers	145 (180)	146 (150)	190 (150)	202 (200)	124 (150)	133 (200)
6. VHF NA Systems	"	-	6 (20)	-	12 (200)	280 (200)	50 (400)
7. MARR 24 Systems	"	4	19 (20)	5 (20)	42 (100)	80 (80)	102 (165)

DIGITAL SYSTEMS EQUIPMENT

Bangalore	Not fixed	Rs. in Lakhs	153 (200)	261 (250)	508 (500)	1964 (2800)	1061 (NA)	NA (NA)
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Note : Crossbar Division, Bangalore was phased out of and Special Products Division, Bangalore was formed with effect from 1.4.1988.

ANNEXURE-III (Referred to in para 5.2(iii))

Production and Targets in Bangalore Complex for item manufactured inhouse.
(In lakhs standard manhours)

Division/Particulars	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
1. STROWGER						
a) Inhouse Manufacture						
- Targets	43.20	40.46	39.66	35.61	14.99	8.55
- Achievements	39.47	34.29	35.07	27.50	11.21	6.83
- Percentage	91.37	84.75	88.43	77.23	74.79	79.88
b) Percentage of Achievement of overall Production target	100.59	106.54	NA	67.38	77.00	
2. CROSSBAR						
a) Inhouse Manufacture						
- Targets	18.37	14.22	-	-	-	
- Achievements	14.56	10.77	-	-	-	
- Percentage	79.26	75.74	-	-	-	
b) Percentage of Achievement of overall Production target	121.56	102.07	-	-	-	
3. TELEPHONES						
a) Inhouse Manufacture						
- Targets	20.85	19.94	19.05	17.20	17.56	11.39
- Achievements	15.90	13.69	18.07	13.49	13.98	8.24
- Percentage	76.26	68.66	94.86	78.43	79.62	72.34
b) Percentage of Achievement of overall Production target	76.66	100.07	NA	77.84	111.00	
4. TRANSMISSION (Including Defence Production)						
a) Inhouse Manufacture						
- Targets	21.62	22.20	19.82	11.73	14.09	13.26
- Achievements	17.96	14.69	17.45	11.13	11.69	10.78
- Percentage	83.07	66.17	88.04	94.88	82.97	81.30
b) Percentage of Achievement of overall production target	96.60	92.07	NA	114.00	104.00	
5. ELECTRONIC SWITCHING DIVISION						
a) Inhouse Manufacture						
- Targets	-	-	-	-	9.53	11.43
- Achievements	-	-	-	-	7.92	9.75
- Percentage	-	-	-	-	83.11	85.30
b) Percentage of Achievement of overall production targets	-	-	-	-	94.00	

ANNEXURE-IV (Referred to in Para 5.2(iv))

Targets and Production of spares in Bangalore Complex.

Division/Year	Original Target	Production	Percentage of Shortfall/ (Excess)
A. STROWGER DIVISION (Rs. in lakhs)			
1986-87	480	607	(26.5)
1987-88	600	900	(50)
1988-89	1500	1220	18.67
1989-90	1000	1100	(10.00)
1990-91	497	750	(50.91)
1991-92	1550	1147	26.00
B. TELEPHONE DIVISION (Rs. in lakhs)			
1986-87	400	736	(84.00)
1987-88	600	581	3.17
1988-89	600	621	(3.5)
1989-90	650	506	22.16
1990-91	200	727	(263.5)
1991-92	250	391	(56.40)
C. TRANSMISSION DIVISION (Numbers)			
1986-87	8000	6240	22.00
1987-88	6000	9117	(51.95)
1988-89	6000	7940	(32.34)
1989-90	5000	5875	(17.50)
1990-91	NIL	NIL	NIL
1991-92	1150	1162	(1.04)
D. DEFENCE PRODUCTION			
1986-87	6000	8860	(47.7)
1987-88	6000	4685	21.92
1988-89	4000	4798	(19.9)
1989-90	3500	8000	(128.57)
1990-91	2000	9624	(381.2)
1991-92	NA	NA	NA

ANNEXURE-V (Referred to in Para 5.2(xi))

• Machine Utilisation in different Units/Divisions of the Company.
(In lakh hours)

Division/Year	Machine Hours Available	Idle	Percentage of Idle hours to available hours.
BANGALORE			
STROWGER DIVISION			
1986-87	15.68	3.67	23.40
1987-88	15.23	3.53	23.18
1988-89	14.86	3.92	26.38
1989-90	13.01	3.56	27.36
1990-91	7.34	2.10	28.61
1991-92	4.28	0.93	21.73
CROSSBAR DIVISION			
1986-87	6.18	2.47	39.97
1987-88	6.02	2.53	42.03
1988-89	-	-	-
1989-90	-	-	-
1990-91	-	-	-
1991-92	-	-	-
TELEPHONE DIVISION			
1986-87	8.02	2.33	29.05
1987-88	7.94	2.32	29.22
1988-89	7.23	1.74	24.07
1989-90	7.20	2.21	30.69
1990-91	6.47	2.61	40.34
1991-92	6.57	3.14	47.79
TRANSMISSION DIVISION			
1986-87	3.64	0.78	24.43
1987-88	2.80	0.57	20.36
1988-89	2.68	0.54	20.15
1989-90	2.71	0.54	19.93
1990-91	2.71	0.59	21.77
1991-92	2.05	0.25	12.20
SPECIAL PRODUCTS DIVISION			
1988-89	3.36	2.34	69.64
1989-90	2.65	1.68	63.40
1990-91	2.84	1.34	47.18
1991-92	NA	NA	

NAINI

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1986-87	-	-	36.51
1987-88	-	-	29.45
1988-89	-	-	27.56
1989-90	1.84	0.42	22.82
1990-91	1.84	0.40	21.73
1991-92	1.85	0.47	25.41

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1986-87	-	-	35.52
1987-88	-	-	29.67
1988-89	-	-	27.22
1989-90	2.27	0.51	22.46
1990-91	2.24	0.44	19.65
1991-92	2.25	0.56	24.89

RAE BARELI

STROWGER DIVISION

1986-87	9.37	3.17	33.83
1987-88	9.34	2.42	25.91
1988-89	10.30	2.76	26.79
1989-90	9.70	2.85	29.38
1990-91	9.64	2.25	23.34
1991-92	9.49	2.33	24.55

CROSSBAR DIVISION

1986-87	-	-	-
1987-88	1.99	0.44	22.11
1988-89	3.19	0.72	22.57
1989-90	3.16	0.83	26.26
1990-91	3.23	0.88	27.24
1991-92	3.25	0.64	19.69

MANKAPUR

E.S.S.

1986-87	3.91	3.19	81.59
1987-88	5.49	3.43	62.48
1988-89	16.05	8.06	50.22
1989-90	12.37	3.71	30.00
1990-91	13.69	0.64	4.67
1991-92	3.14	1.79	57.01

*(Includes Defence Production Division from June 1985)

NOTE : Figures for the column left blank are not available.

ANNEXURE-VI (Referred to in Para 6.6)

STREAM	1989-90				1990-91				1991-92		
	PLND PROD	FIRM ORD AVL	LOI AVL	BAL ORD REQD	PROV PROG	FIRM ORD AVL	LOI AVL	BAL ORD LOT REQD	FIRM ORD AVL	LOI AVL	BAL ORD AVL LOT REQD
1. STROWGER											
MAI II & III(LF) LINE	120000	122050	-	-	-	-	-	-	-	-	-
MAI I & II(US) LINE	70000	64100	10200	5900	50000	29400	3000	17600	NIL	NIL	50000
2. CROSSBAR											
ICP TYPE LINE	75000	62000	11500	13000	80000	28000	90500	-	4000	84000	-
3. ELECTRONIC											
A. E10-B LINE	520000	521260	-	-	665000	104000	690000	-	NIL	838000	-
B. DTAX CCIS	38000	42700	28200	-	45000	1500	NIL	43500	NIL	NIL	45000
C. ILT 512P LINE	76000	43500	6000	32500	263400	NIL	130000	133400	NIL	NIL	263400
D. ILT2048P LINE	35000	NIL	36000	35000		NIL	40000		NIL	NIL	
E. MILT64P UNITS	760	520		240	1100	NIL	1000	1100	NIL	NIL	1100
F. EPAX PAN LINE	20000	14600	6600	5400	22000	4000	20000	-	NIL	NIL	22000
G. C-DOT RAX 128P LINE	50000	25874	26400	24126	68000	NIL	NIL	68000	NIL	NIL	68000
H. C-DOT MAX LINE	50000	1000	NIL	49000	72000	NIL	81500	-	NIL	176500	-
4. TELEPHONES											
VARIOUS TYPES NOS.	1020000	419000	306000	601000	1137000	NIL	NIL	1137000	NIL	NIL	1137000

PRODUCT	1989-90					1990-91				1991-92		
	PLND PROD	FIRM ORD	ABO AVL	LOI AVL	BAL ORD REQD	PROV PROG	ORD AVL	LOI/ APO	BAL ORD/ LOI REQD	ORDER AVL	LOI/ APO	BAL ORD/ AVL LOI REQD
TRANSMISSION												
1a. Radio Eqpt Analog Bays	62	22	55	33	40	30	NIL	NIL	30	NIL	NIL	30
b. Digital Radio Eqpt I/R	300	248	-	92	52	380	NIL	NIL	380	NIL	NIL	380
2a. Coax Eqpt Analog Bays	50	31	-	39	19	10	NIL	NIL	10	NIL	NIL	10
b. Digital Coax 140 MB TML	38	54	-	-	-	52	NIL	NIL	52	NIL	NIL	52
c. Digital Coax 140 MB RFTR	259	452	-	-	-	222	NIL	NIL	222	NIL	NIL	222
3. Multiplexing (i) line Bays	215	296	17	120	-	100	NIL	NIL	100	NIL	NIL	100
Multiplexing (ii) MUX (CP-7) CRPS	1200	753	38	244	247	600	NIL	NIL	600	NIL	NIL	600
a. MFB BAY Nos.	40	62	-	-	-	80	NIL	12	68	NIL	NIL	80
b. CTE MK II BAY Nos.	100	151	-	-	-	360	82	18	260	NIL	NIL	360
c. CTE MII Groups Nos.	700	1464	-	-	-	2400	NIL	1500	900	NIL	NIL	2400
d. GTE MII BAY Nos.	20	52	-	-	-	100	NIL	NIL	100	NIL	NIL	100
e. GTE MII Groups Nos.	100	418	-	-	-	800	NIL	41	759	NIL	NIL	800
f. 4 Wire ACCESS BAY Nos.	100	173	-	-	-	22	-	79	-	NIL	NIL	-
g. LM Ericsson Chig Nos.	700	595	NIL	NIL	105	600	NIL	NIL	600	NIL	NIL	600
h. 12 Chl Bay (CP-5) Nos.	100	111	-	-	-	-----Phased out-----						
i. 12 Chl Groups (CP-5) Nos.	500	669	-	-	-	-----Phased out-----						

4a. TDM VFT Terminal	484	1051	-	-	-	784	-	-	784	-	-	784
VFT Groups Nos.	23	134	-	-	-	80	-	-	80	-	-	80
4b. TDM VFT Terminal Nos.	150	142	-	400	-	600	NIL	600	-	NIL	NIL	600
5. INTERSTICE BAY Nos.	76	101	-	-	-	100	NIL	NIL	100	NIL	NIL	100
INTERSTICE Groups	276	484	-	-	-	300	NIL	NIL	300	NIL	NIL	300
6. SATCOM												
a. LCTD Bay Nos.	21	58	-	-	-	36	-	-	36	-	-	36
b. LNA (1+1) Sys.	21	72	-	-	-	22	-	-	22	NIL	NIL	22
c. BCE Chains (TX/RT) Nos.	18	11	NIL	NIL	7	12	NIL	NIL	12	NIL	NIL	12
7. PCM Systems:												
a. 2 Nos. (Primary Mux) Sys.	1250	556	NIL	NIL	694	1200	NIL	NIL	1200	NIL	NIL	1200
b. PCM Line Eqpt sys	1500	1001	NIL	NIL	499	5650*	NIL	NIL	5650	NIL	NIL	5650
c. 8 Nos. (11 order) TMLS	1200	831	NIL	366	369	2730	NIL	NIL	2730	NIL	NIL	2730
d. 34 Nos. (11 Order) TMLS	600	382	NIL	249	218	940	NIL	NIL	940	NIL	NIL	940
8. Fibre Optics TMLS	150	438	-	-	-	855	NIL	NIL	855	NIL	NIL	855
9. DC IS 18.0 Mc US Sets	175	159	NIL	NIL	16	200	NIL	NIL	200	NIL	NIL	200
10. MARR Sys.	50	79	-	20	-	105	NIL	NIL	105			
11. Single Chl. VHF BAY Nos.	100	212	-	-	-	3000	NIL	NIL	3000	NIL	NIL	3000
12. Video Coax. Bay Nos.	10	14	-	8	-	10	NIL	NIL	10	NIL	NIL	10
13. Open wire system												
a. 3 Chl. Bay Nos.	1800	3142	-	-	-	400	NIL	NIL	400	NIL	NIL	400
b. 8 Chl. Bay Nos.	200	924	-	-	-	150	NIL	NIL	-	NIL	NIL	-

* INCLUDES THE REFRATERS.

ANNEXURE-VII (Referred to in Para 6.7)

Statement showing commitments and supplies of equipments by the Company to DOT.

Sl. Particulars No.	1984-85		1985-86		1986-87		1987-88		1988-89		1989-90		1990-91		1991-92		
	Commitment	Actual supplies (\$ short-fall in brackets)	Commitment	Actual supplies (\$ short-fall in brackets)	Commitment	Actual supplies (\$ short-fall in brackets)	Commitment	Actual supplies (\$ short-fall in brackets)	Commitment	Actual supplies (\$ short-fall in brackets)	Commitment	Actual supplies (\$ short-fall in brackets)	Commitment	Actual supplies (\$ short-fall in brackets)	Commitment	Actual supplies (\$ short-fall in brackets)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
I. STROWGER (Bangalore & Rae Bareli)																	
i) RACKS							1. MAX I Rae Bareli (lines)	52100	33500	35100	33300	27000 (18.9)	50000	70500	31700	27100	
a) Uniselector	100	151	155	151 (3)	110	107 (3)	2. MAX II Rae Bareli (lines)	20000	-	-	30800	34900	-	-	-	-	
b) Group Selector	191	393	371	396	510	335 (34)	3. MAX III Bangalore (lines)	60000 53345	63000	78350	45000	45575	-	-	-	-	
							4. MAX II Bangalore	-	25100	35800	30700	26100 (15)	-	-	-	-	
c) Final Selector	285	81 (72)	40	42	75	101	5. SAX Bangalore (lines)	25000	25000	25000	23800 (4.8)	25200	20800 (17.5)	20000	22200	11600	25000
d) Composite	275	266 (3)	210	307	410	573	6. PABX Bangalore (lines)	5000	3700	4500	5500	5330 (3.6)	-	-	-	-	
e) Misc Racks	549	819	791	857	920	825 (10)	7. Telex Bangalore Dig units(Nos.)	2625	3000	4693	4000	4344	25	35	21	43	
f) Meter Racks	-	-	93	114	50	121	Strowger ITEX (No. of exchange)	10	14	15	20	0 (100)	-	-	-	-	
TOTAL RACKS	1400	1710	1660	1867	2075	2062 (1)	Auto Telex (lines)	240	240	-	-	-	-	-	-	-	
							STD, SL00, MLOD (No. of exchanges)	34	34	29	24	-	-	-	-	-	

ANNEXURE-VII (Referred to in Para 6.7)

Statement showing commitments and supplies of equipments by the Company to DOT.

Sl. Particulars No.	1984-85		1985-86		1986-87		1987-88		1988-89		1989-90		1990-91		1991-92		
	Commit- ment	Actual supplies (% short- fall in brackets)	Commit- ment	Actual supplies (% short- fall in brackets)	Commit- ment	Actual supplies (% short- fall in brackets)	Commit- ment	Actual supplies (% short- fall in brackets)	Commit- ment	Actual supplies (% short- fall in brackets)	Commit- ment	Actual supplies (% short- fall in brackets)	Commit- ment	Actual supplies (% short- fall in brackets)	Commit- ment	Actual supplies (% short- fall in brackets)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ii) Small Exchange lines-MAX III	55000	45785	48000	52055	48000	59650	-	-	-	-	-	-	-	50000	70500	31700	27100 (85)
iii) Switches	66000	73611	69000	76676	77000	70497 (8)	-	-	-	-	-	-	-	-	-	-	-
iv) Relay Sets	31850	33106	33000	37088	37000	37950	-	-	-	-	-	-	-	-	-	-	-
II. CROSSBAR (Bangalore and Rae Bareli)																	
i) Selector frames	6895	4170 (40)	7166	6590 (8)	7548	7280 (4)	Penta Conta Lines (Bangalore) 68232 28482 (58)		-	-	-	-	-	-	-	-	-
ii) Relay frames	8554	7118 (17)	7180	8471	8310	7632 (8)	ICP LINES (Rae Bareli) 60000 75000		76000	62500 (18)	54000	12500 (77)	60000	41000	54000	60000	
iii) Distribution																	

ANNEXURE-VIII (Referred to in Para 6.00 (ii))

Illustrative cases of quantity ordered vis-a-vis quantity delivered for the shop orders opened for more than 6 months.

		Quantity			
		Order No.	Ordered	Delivered	Percentage
I. TELEPHONE DIVISION					
1.	TA06D006 DJL	011634L	60000	47500	79.16
2.	TA06D009 DJL	015330A	250000	60170	24.07
3.	TA006E050 DL	01057/A1	10000	3500	35.00
4.	TA06G084 DL	015334/A	50000	16675	33.35
5.	TB06D001 DL	097020/A-1	50000	43087	86.17
II. STROWGER					
1.	SC05D046 DL	075519A	300000	220715	73.57
2.	SD06M007 BL	071607A	200000	159029	79.51
3.	SD06J015 BL	071607X	100000	79410	79.41
III. CROSSBAR					
1.	BA06A001 AP	504796	20000	2750	13.75
2.	BA06E011 AP	3399408	480000	314900	65.60
3.	BPO6B172 ABO	10910020	30	9	30.00
4.	B906A187 PREL	0331133	1000	764	76.40
5.	BA06A002 AP	504738	100000	2820	2.82
6.	BA078018 AP	3899420	160000	8000	5.00
IV. TRANSMISSION					
1.	XE56G201 DE	526580/A4	120	20	16.66
2.	XG27G237 DE	526934/A1	182	96	52.74
3.	XG27G401 DE	112089/A1	22	4	18.18

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
530 SOUTH EAST ASIAN AVENUE
CHICAGO, ILLINOIS 60607

RECEIVED
JAN 15 1964

TO: DR. J. H. GOLDSTEIN
FROM: DR. J. H. GOLDSTEIN
SUBJECT: [Illegible]

RE: [Illegible]

DATE: [Illegible]

BY: [Illegible]

FOR: [Illegible]

BY: [Illegible]

FOR: [Illegible]

ERRATA

<u>S.No.</u>	<u>PAGE No.</u>	<u>REFERENCE</u>	<u>FOR</u>	<u>READ</u>
1.	15	Last line	The Management Deleted stated (May 1989) that the target	
2.	16	First line	targets.	Deleted
3.	60	Headings of Columns 1990-91	BAL ORD LOT REQD	BAL ORD/ LOI REQD
4.	60	Headings of Columns 1991-92	BAL ORD AVL LOT REQD	BAL ORD/ LOI REQD
5.	61	Headings of Columns 1989-90	ABO AVL	APO
6.	61	Headings of Columns 1991-92	BAL ORD/ AVL LOI REQD	BAL ORD/ LOI REQD

ERRATA

Page	Line	Original	Correction
1	12	LAST LINE	THE 2nd word
2	54	FIRST LINE	LAST LINE
3	80	Heading of	Heading of
4	80	Column	Column
5	80	Heading of	Heading of
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