

**ASIAN DEVELOPMENT BANK**

**PPA: IND 22139**

**PROJECT PERFORMANCE AUDIT REPORT**

**ON THE**

**TELECOMMUNICATIONS PROJECT  
(Loan 886-IND)**

**AND**

**SECOND TELECOMMUNICATIONS PROJECT  
(Loan 954-IND)**

**IN**

**INDIA**

**August 2000**

## CURRENCY EQUIVALENTS

Currency Unit – Indian rupee/s (Re/Rs)

### Loan 886-IND: Telecommunications Project

	<b>At Appraisal</b> (1 March 1988)	<b>At Project Completion</b> (28 May 1997)	<b>At Post Evaluation</b> (31 March 2000)
Re1.00 =	\$0.07123	\$0.02792	\$0.02293
\$1.00 =	Rs14.04	Rs35.82	Rs43.61

### Loan 954-IND: Second Telecommunications Project

	<b>At Appraisal</b> (31 December 1988)	<b>At Project Completion</b> (12 December 1996)	<b>At Post Evaluation</b> (31 March 2000)
Re1.00 =	\$0.06680	\$0.02809	\$0.02293
\$ 1.00 =	Rs14.97	Rs35.60	Rs43.61

## ABBREVIATIONS

ADB	–	Asian Development Bank
CDTMX	–	computerized digital trunk manual exchange
ckm	–	conductor kilometer
DOT	–	Department of Telecommunications
DTS	–	Department of Telecom Services
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
HCL	–	Hindustan Cables Limited
IDR	–	intermediate digital rate
IGTX	–	international gateway telephone exchange
INTELSAT	–	International Telecommunications Satellite Organization
INMARSAT	–	International Maritime Satellite Organization
MTNL	–	Mahanagar Telephone Nigam Limited
OEO	–	Operations Evaluation Office
PCR	–	project completion report
PIJF	–	polyethylene insulated jelly filled
PPTA	–	project preparatory technical assistance
PPAR	–	project performance audit report
R&D	–	research and development
STD	–	subscriber trunk dialing
TA	–	technical assistance
VSAT	–	very small aperture terminal
VSNL	–	Videsh Sanchar Nigam Limited

## NOTE

The fiscal year of the Government ends on 31 March.

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## BASIC PROJECT DATA

### I. Telecommunications Project (Loan 886-IND)

#### Key Project Data (\$ million)

Item	As Per ADB Loan Documents	Actual
Total Project Cost	247.0	152.86
Foreign Exchange Cost	135.0	88.21
Local Currency Cost	112.0	64.65
ADB Loan Amount/Utilization	135.0	88.21
Foreign Exchange Cost	135.0	88.21
Local Currency Cost	0.0	0.00
ADB Loan Amount Cancellation	0.0	46.79

#### Key Dates

Item	Expected	Actual
Fact-Finding		14 Sep-20 Oct 1987
Appraisal		25 Nov-12 Dec 1987
Loan Negotiations		29 Feb-3 Mar 1988
Board Approval		4 Apr 1988
Loan Agreement		6 May 1988
Loan Effectiveness	5 Aug 1988	28 Jul 1988
First Disbursement		15 Dec 1988
Project Completion	1 Sep 1992	31 Jul 1997
Loan Closing	28 Feb 1993	31 Mar 1997
Months (Effectiveness to Completion)	49	108

#### Key Performance Indicators (%)

Item	Appraisal	PCR	PPAR
Financial Internal Rate of Return	24.4	14.6	—
CDTMX			
- Delhi and Bombay (MTNL)	29.1	—	< 0.0
- Six Cities (DOT) & Domestic Satellite Facilities	12.6	—	< 0.0
- Combined	18.9	—	—
IGTX			
- Delhi, Bombay, Madras	35.8	—	—
- Calcutta Gateway	28.3	—	—
INMARSAT Coast Earth Station	17.6	—	50.2
VSNL Combined	32.0	—	—
VSAT	—	—	—
Economic Internal Rate of Return	36.1	31.3	—
CDTMX			
- Delhi and Bombay (MTNL)	46.8	—	< 0
- Six Cities (DOT) & Domestic Satellite Facilities	21.7	—	< 0
- Combined	30.7	—	—
IGTX			
- Delhi, Bombay, Madras	46.6	—	—
- Calcutta Gateway	43.7	—	—
INMARSAT Coast Earth Station	28.2	—	80.8
VSNL Combined	43.5	—	—
VSAT	—	—	—

**Borrower** India

**Executing Agencies** Department of Telecommunications (DOT)  
Mahanagar Telephone Nigam Limited (MTNL)  
Videsh Sanchar Nigam Limited (VSNL)

## Mission Data

Type of Mission	No. of Missions	Person-days
Fact-Finding	1	87
Appraisal	1	95
Project Administration		
Review	7	95
Special Project Administration	4	42
Project Completion Review	1	57
<b>Total</b>	<b>12</b>	<b>194</b>
Operations Evaluation <sup>a</sup>	1	31

<sup>a</sup> Operations evaluation of the First and Second Telecommunications projects.

## II. Second Telecommunications Project (Loan 954-IND)

### Institution Building

TA No.	Project Title	Type	Consultant Person- Months	TA Amount	Approval Date
1123	Managing Training for Department of Telecommunications (DOT)	ADTA	4.2	\$390,000	9 Feb 1989
1124	Study of DOT's Specifications for Polyethelene-Insulated Jelly-Filled Cable <sup>a</sup>	ADTA	0.0	\$90,000	9 Feb 1989
1125	Study of Industrial Engineering Standards and Costing Systems <sup>a</sup>	ADTA	0.0	\$270,000	9 Feb 1989

ADTA = advisory technical assistance

<sup>a</sup> Cancelled.

### Key Project Data (\$ million)

Item	As Per ADB Loan Documents	Actual
Total Project Cost	254.0	101.62
Foreign Exchange Cost	118.0	67.96
Local Currency Cost	136.0	33.66
ADB Loan Amount/Utilization	118.0	67.96
Foreign Exchange Cost	118.0	67.96
Local Currency Cost	0.0	0.00
ADB Loan Amount Cancellation	0.0	50.04

### Key Dates

Item	Expected	Actual
Fact-Finding		15 May-3 Jun 1988
Appraisal		26 Jul-19 Aug 1988
Loan Negotiations		12-14 Dec 1988
Board Approval		9 Feb 1989
Loan Agreement		15 Mar 1989
Loan Effectiveness	13 Jun 1989	29 May 1989
First Disbursement		5 Sep 1990
Project Completion	31 Dec 1991	31 Dec 1997
Loan Closing	31 Dec 1992	6 Oct 1995
Months (Effectiveness to Completion)	31	103

**Key Performance Indicators (%)**

<b>Item</b>	<b>Appraisal</b>	<b>PCR</b>	<b>PPAR</b>
Financial Internal Rate of Return	17.3	1.2-5.6	—
Economic Internal Rate of Return	28.3	10.1-16.2	< 0

**Borrower** India

**Executing Agency** Hindustan Cables Limited

**Mission Data**

<b>Type of Mission</b>	<b>No. of Missions</b>	<b>Person-days</b>
Fact-Finding	1	54
Appraisal	1	112
Project Administration		
Review	5	82
Special Project Administration	1	8
Project Completion Review	1	36
<b>Total</b>	<b>7</b>	<b>126</b>
Operations Evaluation <sup>a</sup>	1	31

<sup>a</sup> Operations evaluation of the First and Second Telecommunications projects.

## EXECUTIVE SUMMARY

### *The private sector does it better*

In 1988, when the Asian Development Bank (ADB) approved its first telecommunications project in India, telecommunications services in the country were characterized by low levels of access and poor quality. Most of India's telecommunications plants and equipment were old, of poor quality, and technologically obsolete. Telecommunications was a public sector monopoly and the Government of India was the sole provider of telecommunications services. A small number of state-owned enterprises had responsibility for supplying virtually all telecommunications equipment.

The main objective of the Telecommunications Project (Loan 886-IND), approved on 4 April 1988, was to improve the quality of domestic telecommunications services and expand international telecommunications facilities to help meet growing demand. Improved telecommunications were expected to help eliminate infrastructure bottlenecks and promote growth in the commercial and industrial sectors. ADB provided \$135 million from its ordinary capital resources to finance the entire foreign exchange cost of the Project. The actual project cost at completion amounted to \$152.8 million, with a foreign exchange cost of \$88.2 million (58 percent of the actual total cost) and a local currency cost of \$64.6 million. The actual cost of the Project was about 38 percent less than the appraisal estimate because of lower equipment prices.

The Telecommunications Project was expected to have been implemented over a four-year, eight-month period, beginning in January 1988 and ending in August 1992. However, project delays began in the fourth quarter of 1989 when the Government suspended implementation to conduct a review of the telecommunications sector by a telecommunications commission. The suspension lasted about two years. Delays of an additional two years were experienced because the Government failed to issue import licenses for some of the project components. When Project implementation resumed, further delays occurred because of the need to revise tender documents, tender evaluation, and contract awards. This was aggravated by inexperience and unfamiliarity with ADB procedures. As a result of these delays, implementation took nine and a half years.

Even while the first telecommunications project was experiencing delays, ADB approved Loan 954-IND for the Second Telecommunications Project on 9 February 1989 for \$118 million from its ordinary capital resources to finance the entire foreign exchange cost of the Project. The actual project cost at completion amounted to \$101.6 million, with a foreign exchange cost of \$68 million (67 percent of the actual total cost) and a local currency cost of \$33.6 million. The actual cost of the Project was about 60 percent less than the appraisal estimate because of lower equipment prices and the cancellation of a project component. The local cost component was lower because of a change in Government policy on taxes and duties. The second Project was to help expand and improve the quality of telecommunications services, and improve the efficiency of telecommunications equipment manufacturing. Improved telecommunications was expected to help promote growth in the commercial and industrial sectors.

The Government's decision to conduct a review of the telecommunications sector also affected the second Project. The Project was expected to take about three and a half years to complete from July 1988, when advance procurement was authorized by ADB, to project

completion in December 1991. However, overall implementation also took nine and a half years. The main reasons for the delays were the need to retender contracts, a shortage of funds to pay customs duties on some equipment, the slow performance of some suppliers, and a delay in issuing import licenses.

No project preparatory technical assistance (PPTA) was provided to prepare a preliminary design for either project and to assess its technical, financial, and economic feasibility. Moreover, ADB did not do sufficient economic analysis in the telecommunications sector to underpin the rationale for the projects. PPTAs should have been undertaken to clarify the need for the projects and identify key policy issues.

Notwithstanding the long delay, the components of the first Project were implemented satisfactorily. The three satellite earth stations and the associated equipment generated substantial economic and financial benefits and high internal rates of return. However, some of the components are underutilized because of inappropriate technology or inadequate marketing. The second Project was implemented partly satisfactorily. The conversion to polyethylene insulated jelly filled (PIJF) cable production was successful. However, the concast copper rod facility is still not in operation, and the thermo-shrink jointing kits, and telephone and other cord production facilities are idle and will probably never operate. The inability to compete with the private sector in PIJF cable production and the low international prices for PIJF cable made the PIJF cable component economically unviable.

The executing agencies for the first Project are in a good financial position to ensure project sustainability. However, Hindustan Cables Limited (HCL) is in a precarious financial position and the second Project is not sustainable without Government budgetary support. HCL's inability to effectively compete with the private sector in price is the main reason for its small share of the PIJF market.

The experience with the two Projects highlights one major issue. The telecommunications industry is a rapidly changing one with new technologies becoming available frequently. To keep up with these advances, telecommunications companies need flexibility in their investment decisions and the marketing of their services. Public sector enterprises are not suited to operating in the telecommunications sector.

This project performance audit finds that both Projects were unsuccessful. The rationale of the first Project was weak and project preparation was poor. The Government's initial decision to cancel a major portion of the loan as a result of a telecommunications sector review should have been supported by ADB, rather than convincing it to reverse its decision. The major objective of the Project (supporting economic growth) was achieved to a limited extent, although several components of the Project are either underutilized or not in use. The Project was not accompanied by any policy reforms to place the telecommunications sector on a sounder economic footing and there was no evidence that the Project benefited the poor.

The rationale of the second Project was also weak and project preparation poor. The Project added telephone cable manufacturing capacity in an area where the private sector adequately met the market demand. HCL is inefficient and cannot compete with the private sector. Thus, the Project is not sustainable without government support. The Project did not succeed in achieving its objective of improving the efficiency of telecommunications equipment manufacturing.

The evaluation demonstrated the need for a sound project rationale. It should be based on a well-defined and focused country operational strategy, supported by PPTA. A PPTA should be mandatory if there is little or no experience in the sector. Project preparation should include an assessment of the sector's policy environment and the scope for private sector involvement in the sector. Support for interventionist government policies is not appropriate. Project preparation should also assess the institutional capabilities of the executing agency and ensure that sufficient consulting services are provided during project implementation.

Project administration also needs to closely monitor the policy environment in which a project is being implemented, in addition to its usual activities regarding procurement and other implementation activities. Any major changes should be assessed in light of the project's rationale and objectives, and the economic and financial feasibility of the project should be reassessed to ensure continued relevance. If the rationale is no longer relevant or the project is no longer viable, steps should be taken to terminate the project.

## I. BACKGROUND

### A. Rationale

1. Telecommunications services in India in 1988 were characterized by low levels of access and poor quality. The average telephone density was 0.52 direct exchange lines per 100 people, one of the lowest in Asia. The average waiting time for obtaining a telephone connection was more than three years. Most of the country's telecommunications plants and equipment were old, of poor quality, and technologically obsolete. Congestion and fault rates were high. Telecommunications was a public sector monopoly, with the Government as the sole provider of telecommunications services. A small number of state-owned enterprises had responsibility for supplying virtually all telecommunications equipment. Recognizing that poor telecommunications were a serious impediment to economic growth, the Government embarked on a program of modernization and expansion, mainly through the introduction of digital technology, under the 1986-1990 seventh five-year plan. Restrictions on the import of advanced technologies were to be eased and domestic equipment manufacturing was to be gradually liberalized. Efficiency and effectiveness were also to be improved through institutional reforms. The modernization drive was to be underwritten by external financing, including financing from multilateral sources.

### B. Formulation

2. The Telecommunications Project was first brought to the attention of the Asian Development Bank (ADB) during the 24 November–4 December 1986 country programming mission to India. A reconnaissance mission was fielded in February 1987 to decide on the components to be included in the Project. However, because of incomplete documentation, a follow-up reconnaissance mission in August 1987 was required to complete project preparation. A contact mission was then fielded in October 1987 to continue the preparation of the Project, and was subsequently upgraded to a fact-finding mission. The ADB appraisal mission visited India from 24 November to 12 December 1987. The Telecommunications Project loan was approved by ADB's Board of Directors on 7 April 1988. This was ADB's first loan to the telecommunications sector in India.

3. The Government lacked the resources for financing some of the components of its investment plan for telecommunications. These components became the basis for the Telecommunications Project. The Project was formulated as a set of disjointed components that, in some cases, did not seem to have a strong rationale. The Project was not coordinated or monitored as part of an overall investment plan including other funding organizations, such as the World Bank. ADB staff in charge of project preparation were not successful in introducing any policy measures into the Project because of strong Government resistance to policy conditionalities. The Government's stance was supported by senior staff in ADB.<sup>1</sup> In short, project preparation was weak and the Project lacked focus.

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<sup>1</sup> Government officials had direct contact with ADB headquarters during the preparation of the Project, according to ADB mission staff. Thus, mission staff were not in a strong position to negotiate policy conditions for the Project. The lack of policy conditionalities under the Telecommunications Project was a major concern of some members of ADB's Board of Directors.

4. The Government of India requested the Second Telecommunications Project during the 1-12 February 1988 country programming mission. A reconnaissance mission was fielded in May-June 1988 to carry out preparatory work on the Project. This was subsequently upgraded to a fact-finding mission. The appraisal mission visited India in July-August 1988. The Second Telecommunications Project (the second Project) loan was approved by ADB's Board of Directors on 9 February 1989, less than a year after approval of the Telecommunications Project (the first Project).

5. No project preparatory technical assistance (PPTA) was provided to prepare a preliminary design for either project and to assess its technical, financial, and economic feasibility. Since India had begun borrowing from ADB only in 1986, ADB had not done sufficient economic or sector analysis to clarify the rationale for the projects. Even though there was a major lack of understanding of the sector's policy issues, ADB seemed keen to quickly enter a sector in which it had little experience. There was no justification for dispensing with the PPTAs; it would have been highly desirable to implement one for each project to justify the need for each project and identify key policy issues. Although ADB's Board of Directors noted these weaknesses during the discussions on loan approvals, it nevertheless gave its approval.

6. The Board of Directors also noted that the first Project lacked policy content. A major weakness that the Board identified was the lack of measures to privatize the telecommunications sector and the lack of cofinancing in the sector by commercial sources. Some Board members felt that ADB should not finance telecommunications in India because the World Bank and other funding agencies were already providing substantial assistance. But the extent of ADB's coordination with the World Bank and other aid agencies was not evident from the Project documents. The Board also noted weaknesses in the financial position of some of the executing agencies and a lack of rationale for some project components. In the case of the second Project, two Board members abstained from voting on the loan. Board members pointed out that telecommunications was highly protected in India, ADB had no country strategy to guide its program of assistance, and the Government's policy to liberalize and deregulate the sector was vague. It was also pointed out that the Project seemed to be hastily put together and the evaluation in the project documents was superficial. Several Board members did not agree with the inclusion of the three technical assistance (TA) components in the Project.

7. In November 1989, the Government notified ADB that it intended to cancel \$114 million of the \$135 million first Project and was likely to cancel the entire second Project as well because of changes in its telecommunications policy related to procurement of equipment from domestic sources. A formal request was made to cancel the \$114 million in March 1990, but the Government changed its mind and reaffirmed its support for the second Project. The Government reversed its decision to cancel the \$114 million in September 1991 on the advice of the ADB.

8. ADB project staff confirm that ADB actively pursued the reversal of the Government's decision to cancel the major portion of the first Project. The motives are unclear, but it was apparently not for economic or technical reasons. As the PPAR will show, it would have been better to cancel the loan as requested or, at the least, reformulate the Project.

### **C. Purpose and Outputs**

9. The main objective of the first Project was to improve the quality of domestic telecommunications services and expand international telecommunications facilities to help meet growing demand. Improved telecommunications were expected to help eliminate infrastructure bottlenecks, and promote growth in the commercial and industrial sectors. The Project had seven components: (i) modernization of manual trunk services by providing and installing computerized digital trunk manual exchange (CDTMX) equipment at 8 locations; (ii) improvement of domestic satellite facilities at 12 locations by providing intermediate digital rate (IDR) equipment to enable digital transmission; (iii) upgrading of international gateway telephone exchange (IGTX) facilities at Delhi, Mumbai, and Chennai; (iv) establishment and expansion of IGTX at Calcutta in two phases; (v) establishment of an International Telecommunications Satellite Organization (INTELSAT) F2-type earth station at Calcutta; (vi) establishment of an INTELSAT A-type earth station near Calcutta; and (vii) establishment of an International Maritime Satellite Organization (INMARSAT) C-type coast earth station near Mumbai.

10. The objective of the second Project was to help expand and improve the quality of telecommunications services, and improve the efficiency of telecommunications equipment manufacturing. A secondary objective was the institutional strengthening of the Department of Telecommunications (DOT) and the Ministry of Industry's Department of Public Enterprises through the provision of technical assistance. Improved telecommunications were expected to help promote commercial and industrial growth. The Project had six components: (i) provision and installation of equipment to convert cable manufacturing by Hindustan Cables Limited (HCL)<sup>2</sup> at Hyderabad and Rupnarainpur from paper-covered unit twin to polyethylene insulated jelly filled (PIJF), with a total installed capacity of 2.5 million conductor kilometers (ckm), and convert HCL's production of coaxial cables to PIJF at Rupnarainpur, with a total installed capacity of 0.6 million ckm; (ii) civil works, and provision and installation of equipment to establish a new unit for PIJF cable production at Rupnarainpur, with a total installed capacity of 1.8 million ckm; (iii) provision and installation of equipment, and technical collaboration to manufacture thermo-shrink jointing kits at Rupnarainpur; (iv) provision and installation of equipment, and technical collaboration to manufacture telephone cords at Rupnarainpur; (v) provision of equipment to augment HCL's research and development (R&D) at Hyderabad and establish a new R&D unit at Rupnarainpur; and (vi) provision of raw materials for trial-run operations of components (i) to (iv).

### **D. Cost, Financing and Executing Arrangements**

11. ADB approved Loan 886-IND: Telecommunications Project for \$135 million from its ordinary capital resources on 4 April 1988 to finance the entire foreign exchange cost of the Project (Basic Project Data and Appendix 1). The Government provided budgetary support for the local costs incurred by the Department of Telecommunications. The executing agencies, Mahanagar Telephone Nigam Limited (MTNL)<sup>3</sup> and Videsh Sanchar Nigam Limited (VSNL),<sup>4</sup>

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<sup>2</sup> HCL is a wholly Government-owned telephone cable manufacturing enterprise.

<sup>3</sup> MTNL provides telecommunication services in Delhi and Mumbai. It is a publicly traded company with Government majority ownership.

<sup>4</sup> VSNL provides international telecommunication services throughout India. It is entirely owned by the Government.

financed the local costs of their components from their own resources. The loan had a term of 24 years, including a grace period of 4 years, with interest determined in accordance with the pool-based variable lending rate system and a commitment charge of 0.75 percent per annum. ADB financing covered 55 percent of the total project costs of \$247 million as estimated at appraisal. The borrower was India. The Government re-lent the loan funds to MTNL and VSNL at 18 percent<sup>5</sup> for 12 years, with no grace period. The Government bears the foreign exchange risk.

12. ADB approved Loan 954-IND: Second Telecommunications Project for \$118 million from its ordinary capital resources on 9 February 1989 to finance the entire foreign exchange cost of the Project (Basic Project Data and Appendix 2). The executing agency, HCL, financed the local cost components. The loan had a term of 24 years, including a grace period of 4 years, with interest determined in accordance with the pool-based variable lending rate system and a commitment charge of 0.75 percent per annum. ADB financing covered 46 percent of the total project costs of \$254 million as estimated at appraisal. The borrower was India. The Government re-lent the loan funds to HCL at rates in accordance with the Government's standard financing arrangements for development assistance to public sector undertakings and not less than that charged on loans from ADB's ordinary capital resources. Repayment was over 15 years with a 4-year grace period. The Government bears the foreign exchange risk.

## **E. Completion and Self-Evaluation**

13. A project completion report (PCR) for the Telecommunications Project was prepared in December 1997 and discusses the design, scope, implementation, and operational aspects of the Project, and provides detailed project information. The PCR was well prepared and the technical assessment was thorough. However, the economic and financial reevaluations used a different approach from that in the appraisal report. The economic internal rate of return (EIRR) and the financial internal rate of return (FIRR) were based on time-slice analyses whereas the appraisal analyses had been done by component. Since the benefits can be separately identified for most components, EIRRs and FIRRs should have been calculated for each component. The PCR rated the Project as partly successful.

14. The PCR for the Second Telecommunications Project was prepared in September 1997 and also discusses the design, scope, implementation, and operational aspects of the Project, and provides detailed project information. The PCR was adequately prepared from a technical perspective, but it did not sufficiently cover the financial, economic, and institutional aspects of the Project. Although HCL was obviously in financial difficulty, the PCR was still optimistic about HCL's and the Project's prospects. The policy issues that arose from the introduction of competition in the industry were not discussed. The Project was rated as partly successful.

## **F. OEO Evaluation**

15. This project performance audit report (PPAR) focuses on the pertinent aspects of the two Projects, and presents the findings of the Operations Evaluation Mission to India from 16-31 March 2000. The PPAR assesses the projects' relevance, effectiveness in achieving their objectives and generating benefits, and the sustainability of their impacts.

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<sup>5</sup> If loan amounts were repaid within one month of drawdown, the interest rate was 12 percent.

16. The PPAR is based on a review of the PCRs, the appraisal reports, material in ADB files, a report by a consultant engaged by the Operations Evaluation Mission, and discussions with staff members of ADB, the Borrower, and the executing agencies. Copies of the draft PPAR were provided to the Borrower, the executing agencies, and the concerned ADB staff for review and comments. Their comments were taken into consideration in finalizing the report.

## **II. PLANNING AND IMPLEMENTATION PERFORMANCE**

### **A. Formulation and Design**

17. ADB's role in India's development process, according to the Report and Recommendation of the President, was "to provide well-directed and sustained financial assistance in consonance with the Government's own development objectives, priorities, and programs." The operational strategy was "focused on rapid industrialization of the economy, one of the Government's most important objectives." The two projects were consistent with the operational strategy, even though experience had demonstrated that industrialization through public sector investment is generally not efficient and often leads to serious resource misallocation. Moreover, poverty in India was, and still is, endemic with more than half the population living on less than a dollar a day. The project designs did not include any elements specifically for poverty reduction.

18. With the exception of the CDTMX component, the telecommunications equipment appears to have been appropriate and according to industry standard. The CDTMX equipment is industry standard, but it is questionable whether it was appropriate at the time of project appraisal. DOT and MTNL knew that manual trunk traffic would decrease as subscriber trunk dialing (STD) facilities increased, and the writing of customized software to copy a manual operator trunk desk is not generally considered good practice. Nevertheless, the Government insisted on this approach and ADB acceded to its wishes.

19. The first Project underwent substantial design changes during implementation because of the availability of savings in the project cost resulting from lower than expected prices. The number of CDTMX facilities to be procured was increased from 8 to 14. IDR equipment was provided at 4 more locations in addition to the 12 locations envisaged at appraisal. The upgrading of IGTX facilities was expanded to increase the circuit handling capacity of these facilities by a factor of 3 in Mumbai, 5 in Delhi, and 10 in Chennai. The circuit handling capacity of the IGTX facilities at Calcutta was increased by a factor of 4. An additional INTELSAT A-type earth station was established near Chennai. A very small aperture terminal (VSAT) hub station with a capacity of 200 VSAT stations was established near Mumbai. Digital microwave links were installed between Delhi and Dehradun, and between Mumbai and Arvi. The upgrading of the IGTX facilities, the addition of the INTELSAT station, and the digital microwave links strengthened the Project; the other design changes did not. ADB approved two changes in scope, one in 1991 and one in 1992. Given the number and scope of changes, the whole Project should have been reappraised and redesigned.

20. From a technical perspective, the design of the second Project seems to have been appropriate. The changes in scope were related more to changes in the size of the components rather than their objectives. The establishment of a new PIJF cable production facility at

Rupnarainpur was canceled because of the Government's policy of encouraging more private sector involvement in the production of PIJF cable. A new component was introduced to produce concast<sup>6</sup> copper rods for the production of PIJF cables. This was supposed to reduce the expenditure on imported copper cathodes. As a result, concast copper rods were added to the raw materials component for the trial production runs. The scope of the component for the production of coiled and straight telephone cords was expanded to include the production of other electronic cords. HCL said it had identified a market opportunity to sell computer and other similar cords. However, HCL provided no evidence of such an opportunity. Production of these cords is a relatively simple process and the private sector satisfactorily met the market demand for telephone and other electronic cords. HCL had no obvious competitive advantage in the production of these items. Thus, there was no strong justification for including this component in the Project.

21. The second Project included three TAs, for (i) management training of DOT staff, (ii) a study of DOT specifications for PIJF cables, and (iii) a study of industrial engineering standards and costing systems. The latter two TAs were subsequently canceled because DOT felt that the TA for the specifications study was inadequately formulated, and HCL had already embarked on a computerization program.

## **B. Cost and Scheduling**

22. At appraisal, the first Project was estimated at \$247 million, comprising a foreign currency cost of \$135 million and a local currency cost of \$112 million. ADB provided a loan of \$135 million representing 55 percent of the total cost, while the Government and its agencies were to provide the balance to finance the remaining 45 percent of the total cost. The actual project cost at completion amounted to \$152.8 million, with a foreign exchange cost of \$88.2 million (58 percent of the actual total cost) and a local currency cost of \$64.6 million. The actual cost of the Project was about 38 percent less than the appraisal estimate because of lower equipment prices, even though additional components were included under the changes in scope. An amount of \$46.8 million was canceled from the loan.

23. The second Project was estimated at \$254 million at appraisal, comprising a foreign currency cost of \$118 million and a local currency cost of \$136 million. ADB provided a loan of \$118 million representing 46 percent of the total cost, while HCL was to finance the remaining 54 percent of the total cost. The actual project cost at completion amounted to \$101.6 million, with a foreign exchange cost of \$68 million (67 percent of the actual total cost) and a local currency cost of \$33.6 million. The actual cost was about 60 percent less than the appraisal estimate because of lower equipment prices and the cancellation of a PIJF component under the Project. The local cost component was smaller because of the Government's change in policy on taxes and duties. An amount of \$50 million was canceled from the loan.

24. The first Project was expected to have been implemented over a four-year, eight-month period, beginning in January 1988 and ending in August 1992 (Appendix 3). This seems to have been a reasonable implementation schedule. However, project delays began in the fourth quarter of 1989 when the Government suspended implementation to conduct a review of the telecommunications sector by a telecommunications commission. The suspension lasted about

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<sup>6</sup> Concast is an abbreviation for continuous casting process.

two years. Delays of an additional two years resulted because the Government failed to issue import licenses to VSNL for some of the project components. The Government suspension of implementation led to further delays because of the need to revise tender documents, tender evaluation, and contract awards. This was further aggravated by inexperience and unfamiliarity with ADB procedures. As a result of these delays, implementation took nine and a half years.

25. The Government's decision to review the telecommunications sector also affected the second Project (Appendix 4). The Project was expected to take about three and a half years to complete from July 1988, when advance procurement was authorized by ADB, to project completion in December 1991. However, overall implementation took nine and a half years. The main reasons for the delay were the need to retender contracts, a shortage of funds for HCL to pay customs duties on some equipment, the slow performance of some suppliers, and a delay in issuing import licenses.

### **C. Consultant's Performance, Procurement and Construction**

26. Procurement for both projects was carried out according to ADB's *Guidelines for Procurement*. Equipment for the first Project was procured under international competitive bidding. Additional circuits for the IGTX expansion were procured by repeat order from the original supplier after ADB approval was obtained. The preparation of CDTMX tender documents was very slow and required extensive assistance from ADB staff as DOT was not familiar with ADB procedures. Retendering was required for this component because the Government suspended the Project. DOT took three years to prepare revised CDTMX tender documents, conduct retendering, and award the contract, largely because of rapid developments in digital switching technology and DOT's inability to come to a firm decision on equipment needs. The contractor also had problems with developing the required customized software; after 8 revisions and an additional 10 months, the electronic billing system was commissioned in November 1997. Contracting for the VSAT equipment took more than two years. The contract for the supply and installation of VSAT equipment did not provide for any retention money to be paid on commissioning, as is the normal practice, so the supplier could not be penalized for delays. DOT requested additional software for the VSAT hub during installation, which caused some of the delays. The suppliers of the other components generally performed satisfactorily. No consultants were engaged under the Project, although the provision of consulting services for assistance in tendering would probably have avoided some of the delays.

27. Delays also occurred because of the Government's new policy on procurement of equipment from domestic sources (para. 7). Bids already submitted were broken down by component to identify components that could be contracted locally. The process of scrutinizing each bid was time-consuming and caused additional delays as tenders had to be rewritten and rebid. This fragmentation of contracts made it more difficult to integrate all components into a working system. These delays also added to the risks associated with the selection of technologies. Given the rapid pace of change in the telecommunications industry, technical decisions seldom remain applicable for two years. The fragmentation of the bids to benefit a local supplier is also unfair to other suppliers.

28. Equipment (excluding R&D equipment) and raw materials for the second Project were procured through international competitive bidding. International shopping was used for the R&D equipment because no one supplier could provide all of the components. The supplier of the jointing kits component provided and installed the necessary equipment, but failed to

complete the final phase for the transfer of technology for the manufacture of “preforms.” The manufacture of preforms from raw materials is the initial stage of the production process and the use of imported preforms was not seen as a commercially viable alternative. As a result of this nonperformance, HCL initiated arbitration proceedings in June 1996; this legal action is still ongoing and there is no firm date for this matter to be settled. The performance of the suppliers of PIJF manufacturing, telephone cords, R&D facilities, copper rods, and raw materials components was generally satisfactory. However, the installation of facilities for the manufacture of the telephone and other cords, and for concast copper rods, was delayed because the release of the plant and equipment from the Calcutta port was held up due to HCL’s lack of funds to pay for custom duties. With Government assistance, this plant and equipment have now been delivered and agreements have been reached with the suppliers to finish commissioning the facilities. HCL expects production from these facilities to commence within a year. Like the first Project, no consultants were engaged.

#### **D. Organization and Management**

29. The first Project had three executing agencies. DOT served as the Executing Agency for the CDTMX component outside Delhi and Mumbai, and for the domestic satellite and VSAT components. MTNL was the Executing Agency for the CDTMX component in Delhi and Mumbai, although DOT carried out the procurement on behalf of MTNL. VSNL was the Executing Agency for the IGTX, earth stations, and digital microwave link components. Overall coordination was through DOT’s director of coordination and planning. The director of coordination and planning supervised the implementation of the DOT components, and the general manager (technical) and the general manager (switching planning), supervised the MTNL and VSNL components, respectively. Supervisors of the MTNL and VSNL components satisfactorily discharged their responsibilities. However, DOT did not have the capacity to effectively implement its components of the Project. As a result, long delays occurred even though advance procurement for some parts of the Project was approved by ADB.

30. HCL was the Executing Agency for the second Project. The managing director, assisted by the director (technical and planning), had overall responsibility for implementation. The chief general manager (Hyderabad) and the chief general manager (Rupnarainpur) were responsible for day-to-day implementation at their centers of production. HCL had difficulties implementing the Project. Its financial position was weak and it had problems raising funds for the local cost part of the Project. HCL lacked experience in contracting and selected a supplier (for the jointing kits component) that was not able to supply the necessary technology. Furthermore, the contract conditions between HCL and the supplier did not provide adequate assurance that the technology transfer would be completed.

31. The loan agreements for the two projects contained a number of covenants. In addition to standard covenants related to reporting requirements and the use of loan proceeds, the Loan Agreement for the first Project contained several project-specific covenants related to financial performance. These covenants, except one, were complied with (Appendix 5). The Government was required to furnish ADB with a report on the execution and initial operation of the Project. However, this report was not received by ADB. The main loan covenants of the second Project were also related to financial performance, as well as to the pricing of PIJF cable. However, these were generally not complied with (Appendix 6). The covenanted 13 percent rate of return

on capital employed was not achieved and the financial targets were not amended when the Seventh Pricing Agreement was renegotiated.<sup>7</sup> ADB made no apparent effort to amend the loan covenant's financial targets. The action plan for strengthening HCL's efficiency and productivity was only partly complied with.

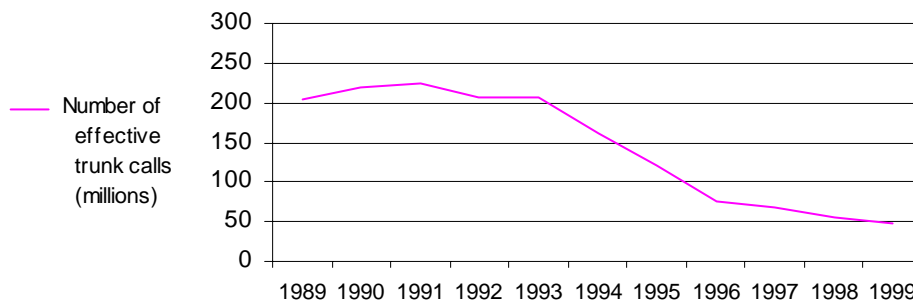
### III. ACHIEVEMENT OF PROJECT PURPOSES

#### A. Operational Performance

##### 1. Telecommunications Project

32. CDTMX facilities were successfully installed at 14 locations<sup>8</sup> and operator training was completed. During implementation, subscribers were beginning to shift from manually switched trunk calls to subscriber trunk dialing (STD) because STD eliminated the need to use an operator for intercity and other calls (Figure). There was also a proliferation of commercially operated public calling offices that used STD. Thus, the number of manual trunk calls fell from 206 million in 1993 to 49 million in 1999 (Appendix 7). Therefore, the use of CDTMXs also fell. Only about 30-40 percent of the CDTMX capacity is currently being utilized and use continues to decline. Although a CDTMX can employ up to 150 operators, the Project's CDTMXs currently employ on average 25 operators. There are no plans to use the CDTMXs for other services.

#### Manual Trunk Traffic



33. The IDR equipment was meant to make more efficient use of the domestic satellite facilities. IDR equipment was installed at 16 locations<sup>9</sup> to enable digital transmission (5 IDR routes with speed at 8 megabits per second and 11 at 2 megabits per second, all using 64 kilobit voice encoding). However, much of the intended cost saving from the IDR equipment was negated by delays in implementing the component. The IDR equipment is operational but the equipment is now used sporadically, in cases where there is equipment failure in other parts of

<sup>7</sup> The Seventh Pricing Agreement stipulated that HCL would sell its output to DOT at cost plus 10 percent. This formula was extended under the Eighth Pricing Agreement that ran from 1989-1992. In 1992, the Pricing Agreement with DOT was terminated.

<sup>8</sup> The 14 locations are Ahmedabad, Bangalore, Calcutta, Chandigarh, Chennai, Delhi, Ernakulam, Hyderabad, Indore, Jaipur, Kanpur, Mumbai, Patna, and Pune.

<sup>9</sup> The 16 locations are Ahmedabad, Bangalore, Bhubaneshwar, Calcutta, Chennai, Delhi, Ernakulam, Guwahati, Hyderabad, Jaipur, Jullundhar, Kalpa, Keylong, Lucknow, Mumbai, and Shimla.

the network or during periods when the network cannot accommodate the volume of traffic. Otherwise, the IDR equipment is idle. The rapid expansion of the fiber optic network<sup>10</sup> has made the IDR equipment largely superfluous.

34. The VSAT hub station was established at Yeur near Mumbai and had a capacity of 200 VSAT stations. However, only 61 VSAT stations are installed at customer premises, about 75 percent at public sector institutions. The poor use of the VSAT stations is because of competition from the private sector. About 9,000 VSAT terminals are presently in use in India. DOT is weak in the marketing of the VSAT service and does not have flexibility in setting the tariff. DOT is also reluctant to sell VSAT terminals, preferring lease arrangements. DOT also required a bank guarantee that customers found onerous and expensive. This requirement has now been removed. DOT currently has 138 customer terminals in stock, which it would like to put into service.

35. IGTX facilities at Chennai, Delhi, and Mumbai were upgraded from analog to digital, and the circuit handling capacity of these facilities was expanded by a factor of 10 in Chennai, 5 in Delhi, and 3 in Mumbai. A digital IGTX was established at Calcutta in two phases. Limited capacity was installed in the first phase to better match capacity with demand. In the second phase, circuit handling capacity was increased by a factor of four. Digital microwave links were installed between Delhi and Dehradun, and between Mumbai and Arvi. The IGTX and digital microwave links are operating as intended.

36. The INTELSAT F2-type earth station was constructed at VSNL's office building in Calcutta where the IGTX facilities were installed. This earth station provides international links for IGTX in the first phase. Two other earth stations, both INTELSAT A-type, were established at Halisahar (near Calcutta) and Thiruvalluvar (near Chennai). All are operating as intended. An INMARSAT C-type coast earth station was established at Arvi, near Mumbai. The rate of utilization of the INMARSAT station has fallen recently, from a traffic volume peak of 2.7 million minutes in 1997 to 1.2 million minutes in 1999. Use is falling because the installed INMARSAT station is based on an analog standard while the new standard is digital. VSNL expects traffic volume for this facility to fall by about 20 percent each year over the next three years.

## **2. Second Telecommunications Project**

37. The conversion of HCL facilities at Hyderabad and Rupnarainpur from paper covered unit twin production to PIJF added 2.5 million ckm of production capacity (Appendix 8). The conversion of coaxial producing facilities to PIJF at Rupnarainpur added another 0.6 million ckm in production capacity. These facilities are still in working order, but are housed in factory buildings that were constructed in 1954 and show signs of advanced deterioration. The standard of maintenance of the PIJF production equipment and the factory floor is low. Equipment is not fine-tuned: chains on pumps are loose and brakes on take-up spools squeal. Waste material from the production process is routinely left on the ground, plastics used in the coating process are not adequately contained, and waste is not properly recycled. At the time of the Operations Evaluation Mission, the factory floor had not been cleaned for some time and may be a safety hazard. The amount of waste from the production process indicates inefficiency. Waste is eventually placed outside on the factory grounds in open piles. In general,

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<sup>10</sup> Fiber optic technology was already in use worldwide during the preparation of the Telecommunications Project.

the maintenance of the PIJF production facilities is inadequate, raising questions about how long the equipment will last.

38. HCL's total production capacity of PIJF cable is now 8.2 million ckm, up from 5.1 ckm in 1992. Production of PIJF cable at the new facilities began in 1993. However, actual production of PIJF cable before 2000 was significantly less than capacity (Table 1).

**Table 1: HCL PIJF Production**  
(in million ckm)

Year	Output	% of Rated Capacity
1993	3.9	48
1994	4.4	54
1995	6.5	80
1996	2.7	33
1997	3.6	44
1998	1.9	23
1999	1.2	15
2000	8.4	104

The Project added 3.1 million ckm to HCL's PIJF capacity. However, the 5.1 million ckm of original capacity could have produced all the PIJF cable demanded annually by DOT, except in 1995 (Appendix 8). Moreover, the private sector began PIJF cable production in 1989 and, by 1997, it had established about 40 million ckm of PIJF production capacity, compared to a total demand of 26.5 million ckm. Today, the private sector capacity is about 80 million ckm and the demand from DOT, the major buyer, is about 50 million ckm annually. Therefore, HCL is a small player in the PIJF cable market. The private sector's involvement in PIJF cable production brings into question the need to have augmented PIJF cable production capacity in HCL. The Project should have been cancelled when the Government changed its policy to encourage private sector investment in the telecommunications sector.

39. HCL's inability to effectively compete with the private sector on price was the main reason for its small share of the PIJF market.<sup>11</sup> Even though a plan was developed for HCL to reduce costs and increase productivity as part of the loan's covenants, HCL was not able to implement the plan with any great success because of a lack of Government support. HCL's high cost structure was the result of a number of factors: (i) substantial surplus labor; (ii) above market wage rates; (iii) a top-heavy management; (iv) high levels of social overheads, including provision of housing, transport, health, education, and other benefits to staff; and (v) burdensome bureaucratic procedures in managing the firm.

40. The Government became concerned about HCL's excess capacity and inability to compete in the market. To improve HCL's competitiveness, the Government agreed to subsidize the voluntary retirement of labor from HCL's workforce; HCL's workforce was reduced

<sup>11</sup> DOT rates 60 percent of the tenders for PIJF cable on price, and the balance on delivery and quality.

from 6,790 persons in 1995 to 5,134 in 1998. Today, the work force is about 4,400.<sup>12</sup> Nevertheless, the current workforce may still be too high. For example, the Rupnarainpur factory employs about 2,000 persons. However, the factory uses about 370 persons for each of three shifts, which is full capacity utilization. This indicates an excess of about 900 persons. The Government also directed state-owned financial institutions to reduce the interest rate on loans to HCL to 4-5 percentage points below the market rate. To improve capacity utilization, DOT was directed to allocate 30 percent of its demand for PIJF cable in 2000 to HCL based on the lowest bid price. The balance was allocated to the private sector based on tender submissions. In 2001, the proportion allocated to HCL will be reduced to 25 percent and, in 2002, the Government will review this policy. Giving HCL a share of the PIJF cable market at the behest of the Government does not encourage efficiency and penalizes the more efficient private producers.

41. The equipment procured for the thermo-shrink jointing kits is stored in an unused, locked factory building at HCL's Rupnarainpur site. It has been sitting unprotected, covered in dust and cobwebs, for the past five years. The equipment seems to be deteriorating from humidity and other natural causes. It is doubtful that this equipment could ever be used for the purpose it was designed. The equipment for the production of telephone and other cords is similarly stored, although it seems to be in better condition. HCL and the supplier of the equipment have agreed to put this equipment into operation, but it is uncertain whether the equipment is still in working condition. The facilities for the production of concast copper rods were installed about a year ago, but are not yet in operation because of a lack of electronic equipment to ensure an uninterrupted power supply.<sup>13</sup> The equipment is in good condition and should operate as designed when uninterrupted power is provided (assuming the facility is soon put into operation). However, there is a risk that HCL will not hire skilled staff to monitor and control the quality of the casting process. The R&D equipment, primarily cable testing equipment, is in good working order.

## **B. Performance of the Operating Entity**

### **1. Telecommunications Project**

42. Three agencies implemented the components of the Telecommunications Project: DOT, MTNL, and VSNL. DOT, renamed the Department of Telecom Services (DTS) in November 1999, operates independently from the Ministry of Communications and prepares its own financial statements (Appendix 9). Over the past 10 years, this department has earned a profit and a high rate of return on its fixed assets. It does not pay income tax but, if it had, it would still be highly profitable. The tariff allowed by the Government is adequate to maintain DTS's good financial position. Its debt load is relatively light with a debt-equity ratio of about 15 percent in 1999. MTNL is an independent, largely government-owned telecommunications company. Its financial statements (Appendix 10) show that MTNL is profitable with a manageable debt load. MTNL pays income tax and a regular dividend. MTNL's shares are listed on several stock exchanges, including London. Its shares are expected to be listed on the New York Stock Exchange next year. VSNL is also an independent, government-owned telecommunications

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<sup>12</sup> The exact number of staff is not available for 2000.

<sup>13</sup> The electronic equipment would ensure that power is restored to the induction furnace within 60 seconds to prevent major damage caused by solidifying copper metal.

company. Its financial statements (Appendix 11) show that VSNL is profitable with virtually no debt. VSNL pays income tax and a regular dividend. With an expanding telecommunications market and falling equipment prices, economies of scale should ensure good financial performance for DTS, MTNL, and VSNL, even without tariff increases.

43. Components of the Project were designed to service the market for long distance calls, both domestic and international. Some of the components provide services that can be identified separately, such as incremental transmission capacity for long distance voice and data services from the IGTX/earth stations, the intermediate digital rate equipment, the VSAT hub, and the digital microwave links. The CDTMX component is an integral part of the overall communications system and its benefits cannot be easily isolated. Nevertheless, some judgment may be made on the impact of this component. Since the CDTMX facilities are grossly underutilized and the trend to STD calls is firmly established, the expected economic benefits of this component have clearly not been realized. The CDTMX was not a least cost solution. Moreover, placing a long distance call via the CDTMX increases revenue to DTS and MTNL by Rs5.00 (about \$0.11). Therefore, there is little incremental financial benefit from the CDTMX service and the FIRR is deemed negative. As pointed out in para. 33, the IDR component is largely superfluous and consequently the economic and financial impacts of this component are negative.

44. The VSAT component is also grossly underutilized, with most of the VSAT terminals still in storage. Nevertheless, the 61 VSAT terminals that have been leased to customers are generating substantial revenue for DTS. For example, in 2000, revenues from the VSAT service were double the initial capital cost of the VSAT hub and terminals. Also, the initial capital cost of the investment was completely recovered in the first three years of operation. Therefore, the calculation of an EIRR or FIRR would not result in any meaningful measure of economic or financial performance. However, the use of scarce public resources has not been efficient. The private sector has more flexibility and provides a more efficient service. Although this component is financially successful, in economic terms, the private sector provides the service at a lower cost.

45. The economic benefits of the components for upgrading the IGTX facilities at Delhi, Mumbai, and Chennai, expanding the IGTX facilities at Delhi, and installing the digital microwave link from Delhi to Dehrandum cannot be estimated separately because these components are relatively small and form an integral part of the whole international telephone network. Nevertheless, the upgrading and expansion of these facilities were necessary from a technical perspective because of the global shift from the analog to the digital standard. Therefore, the economic and financial impact has been positive and substantial.

46. The INMARSAT C-type coastal station, the expansion of the IGTX at Mumbai, and the Arvi-Mumbai digital microwave link are part of the same network that provides marine telecommunications. Therefore, these components are evaluated together, details of which are found in Appendix 13. The calculation of the EIRR and the FIRR assumes that these components require no incremental operating and maintenance costs, as advised by VSNL. Since 1999, telecommunication traffic on the INMARSAT has been falling and is expected to fall about 20 percent per annum because the INMARSAT coastal station is based on an outdated analog standard. Nevertheless, the economic and financial benefits of this component have been substantial. The composite EIRR for these components is 80.8 percent. The corresponding FIRR is 50.2 percent.

47. The two INTELSAT A-type earth stations at Calcutta and Chennai, the INTELSAT F2-type earth station at Calcutta, and the IGTX equipment at Calcutta and Chennai form a unit that may be evaluated together. As in the VSAT and INMARSAT components, the revenues generated by this component have been substantial. By 1994, this component had recovered the entire initial capital investment and, therefore, the calculation of an EIRR or FIRR would not result in any meaningful measure of economic or financial performance. It may be safely concluded that this component is successful from the economic and financial perspectives.

## **2. Second Telecommunications Project**

48. HCL's financial position is precarious and deteriorating rapidly<sup>14</sup> (Appendix 12). HCL has been incurring increasing losses since 1996, losing a record \$65 million in 1998. HCL's equity capital is negligible and is positive only because the Government is subsidizing HCL's losses. Without Government assistance, HCL would quickly become insolvent. HCL seems to have difficulty controlling its expenses. Although the workforce is being reduced, the company's wage bill is still increasing. Staff welfare expenses are inordinately high. Interest payments are high and form a major expenditure item. Although the Government has taken steps to improve profitability (para. 40), it is uncertain whether these measures to turn HCL around financially will be successful. In the meantime, the Government is likely to provide budgetary support to HCL to maintain a company that is inefficient and whose product has little demand.

49. The largest component of the Project was the PIJF cable conversion. The PPAR reevaluates this component on the basis of a with and without project analysis. The concast copper rod, R&D equipment, and raw material components are integral parts of the PIJF cable production process. Subsequent to the approval of the Project, Government policy in the telecommunications sector changed. The private sector was allowed to compete with HCL in the production and sale of PIJF cable in 1989 and the demand for PIJF cable could have been easily met without the Project (para. 38). Therefore, the net economic benefit of these components is negative. The prudent course of action would have been to cancel the Project in the early 1990s when it became obvious that the Project was not needed.

50. Without the policy change allowing the private sector to enter the PIJF cable market, could this Project component have been successful? Appendix 14 indicates that the Project would still not have been economically viable. Based on 2000 labor, raw material, and utility costs, an import price of \$10.00 per ckm of PIJF cable at Calcutta, and the assumption of full capacity utilization of the Project component, the Project has a negative net present value of Rs1,616.7 million. There are three reasons for this outcome. First, HCL is an inefficient producer because of its highly inefficient use of labor and the high cost of raw materials purchased from other state-owned enterprises that are similarly inefficient. Second, international prices of PIJF cable are low. And third, capacity was not fully utilized in the early years of the Project when PIJF cable prices were higher.

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<sup>14</sup> According to HCL's auditors, its financial position is worse than indicated in its financial statements. In 1998, HCL underreported depreciation expenses and made no provision for accrued leave liabilities or for bad and doubtful debts.

51. The components for the manufacture of thermo-shrink jointing kits and of telephone and other electronic cords are not in operation. Given the amount of time that has passed since expenditure on these facilities took place and the uncertainty about when production from these facilities will begin, it is safe to assume that the EIRR and FIRR of these components are negative.

### **C. Sustainability**

52. DTS, MTNL, and VSNL are in a good financial position to ensure the Project's sustainability. On the other hand, HCL is technically insolvent and bankrupt and could not continue operating without Government budgetary support. Given India's vast developmental needs, the Government can ill afford to prop up poorly managed companies such as HCL. With a large number of private sector companies producing PIJF cable, there is no reason for the public sector to be involved in this area. Divestiture of HCL or its assets should be considered and supported by ADB.

## **IV. ACHIEVEMENT OF OTHER DEVELOPMENT IMPACTS**

### **A. Socioeconomic and Sociocultural Impacts**

53. The purpose of the first Project was to improve the domestic and international long distance telephone service. The main beneficiaries of this Project were firms that conduct business nationally and internationally, and households in the higher income brackets. Firms benefited by improving their access to telecommunications that, in turn, improved their efficiency and ability to compete. There is no evidence that the poor benefited from the Project to any significant extent.

54. The socioeconomic impact of the second Project is indirect. HCL requires budgetary support to maintain solvency. These resources could be better used elsewhere, for example, to augment Government poverty reduction programs. Therefore, the Project probably had a negative income distribution effect. There were no gender-specific impacts in either project.

### **B. Environmental Impacts**

55. The first Project had no apparent negative impact on the environment. The second Project resulted in the production of some waste that was not disposed of in an optimal manner. However, this waste is environmentally benign and does not create a hazard except, perhaps, in terms of safety. Nevertheless, as waste builds up (assuming that production continues at the present rate), HCL will need to develop a continuous, environmentally acceptable, disposal process for it.

### **C. Impacts on Institutions and Policy**

56. The first Project made no effort at institutional reform or capacity building. The Project also had no measures to address the policy environment in which the telecommunications sector operates. The lack of policy measures was at the insistence of the Government to which ADB acquiesced (para. 3). The major effort of the second Project at institutional strengthening

was the training TA.<sup>15</sup> Implementation took place from November 1993 to January 1995. The objective of the TA was to strengthen the management capabilities of DOT's middle level managers who are engaged in critical line functions. The areas of focus were (i) network planning for forecasting the needs of the expanding telecommunications system and planning for orderly growth and efficient operations; (ii) operational management to identify and solve problems, monitor and control traffic flow, handle day-to-day routing operations, and organize and schedule work activities; and (iii) development of management information systems to satisfy key information requirements; build effective data bases; use computers to store, process, and retrieve information; and monitor and measure performance.

57. The main TA activities comprised (i) an initial training needs assessment that served as a basis for selecting DOT participants and formulating training modules; (ii) design of course modules;<sup>16</sup> and (iii) provision of four training courses of four weeks each at the consultant's training college in the UK, each involving 10 senior DOT officials. The training courses provided DOT managers with a basic foundation related to network expansion, improvement in the quality of service, and technology change. However, senior DOT officials were not aware of the training that was undertaken in DOT and therefore it is not possible to assess the impact of the TA. The Project had no measures to address the policy environment of the telecommunications sector.

## V. OVERALL ASSESSMENT

### A. Telecommunications Project

58. **Relevance.** The rationale for the Project was weak and project preparation was poor. The motivation for the Project seemed to be to rapidly build up a loan portfolio in India. Project preparation did not include a PPTA and the Project was designed in a piecemeal fashion. There was a lack of understanding of the sector's policy issues and no economic or sector work was undertaken in advance. Although the Project was apparently consistent with the Government's development strategy and ADB's strategic objectives, investment in public enterprises is not the optimal way to achieve these objectives. The Project did not attempt to bring about policy reforms to place the telecommunications sector on a sounder economic footing. Moreover, the Project supported and perpetuated Government policies in the sector that created economic distortions. Opening telecommunications to the private sector would have had a greater economic impact. The Project also had no specific measures to address the poverty issue.

59. **Efficacy.** The major objective of the Project (supporting economic growth) may be said to have been partly achieved. The Project improved the quality of telecommunications services and helped to eliminate some infrastructure bottlenecks. However, not all of the components contributed to the efficacy of the Project – the CDTMX, IDR and VSAT components are underutilized. The introduction of the private sector in a competitive environment would have been more effective in supporting economic growth.

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<sup>15</sup> TA 1123-IND: *Management Training for Department of Telecommunications*, approved on 9 February 1989 for \$390,000. The Government signed the TA Agreement only in January 1991 because of its review of telecommunication policy.

<sup>16</sup> Course components consisted of (i) technical management skills, (ii) operational management skills, (iii) resource management, (iv) personal effectiveness skills, (v) change management, and (vi) a personal action plan. Visits to operational facilities such as customer service centers were included.

60. **Efficiency.** The economic and financial impacts of the first Project are mixed. The IGTX facilities installed in Delhi, Mumbai and Chennai and the digital microwave link from Delhi to Dehrandum were required for technical reasons, so their economic and financial impact is positive and substantial. The component comprising the INMARSAT C-type coastal station, the IGTX facilities at Mumbai, and the Arvi-Mumbai digital microwave link is also a successful investment with a high EIRR and FIRR. The two INTELSAT A-type earth stations at Calcutta and Chennai, the INTELSAT F2-type earth station at Calcutta, and the associated IGTX equipment have also resulted in substantial economic and financial benefits that exceed the opportunity cost of capital. On the other hand, the CDTMX facilities are grossly underutilized and the IDR equipment is not in use. These two components are not cost effective. Although the VSAT component earns a high financial rate of return, the underutilization of the VSAT facilities also results in a lack of cost effectiveness. The lack of policy content in the Project perpetuated distortions in the market that result in a monopoly position for the telecommunications service providers. The Project did nothing to improve economic efficiency in the sector.

61. **Sustainability.** The executing agencies for the Project are in a good financial position to ensure the Project's sustainability.

62. **Institutional Development and Other Impacts.** The Project provided no measures to address institution development and socioeconomic issues. It is unlikely that any of the benefits of the economic growth from the Project trickled down to the poor because long distance telecommunications is a service primarily utilized and higher income groups. Therefore, the Project has no perceivable impact on poverty

63. **Overall Project Rating.** Table 2 summarizes the overall assessment of the Project. The Project is rated as unsuccessful.

**Table 2: Assessment of Overall Project Performance  
Telecommunications Project**

Criteria	Assessment	Rating (0-3)	Weight (%)	Weighted Rating
1. Relevance	Irrelevant	0	25	0.00
2. Efficacy	Less efficacious	1	25	0.25
3. Efficiency	Inefficient	0	25	0.00
4. Sustainability	Substantial	2	15	0.30
5. Institutional Development	Negligible	0	10	0.00
<b>Overall Rating</b>			<b>100</b>	<b>0.55</b>

Rating for relevance: 3=highly relevant; 2=relevant; 1=partly relevant; 0=irrelevant

Rating for efficacy: 3=highly efficacious; 2=efficacious; 1=less efficacious; 0=inefficacious

Rating for efficiency: 3=highly efficient; 2=efficient; 1=less efficient; 0=inefficient

Rating for sustainability: 3=most likely; 2=likely; 1=less likely; 0=unlikely

Rating for institutional development impacts: 3=substantial; 2=moderate; 1=little; 0=negligible

Overall Rating:

HS = highly successful  $2.5 < HS \leq 3.0$

S = successful  $1.6 \leq S \leq 2.5$

LS = less than successful  $0.6 \leq LS < 1.6$

U = unsuccessful  $< 0.6$

64. **Assessment of ADB and Borrower Performance.** The performance of ADB was unsatisfactory in two respects. First, during the preparation of the Project, ADB should have insisted on policy conditions to deregulate and liberalize the telecommunications sector. Second, it was inappropriate for ADB to lobby the Government to reverse its decision to cancel the major portion of the Telecommunications Project loan.

65. During the implementation of the Project, ADB sent seven review missions and four special project administration missions. Additional review was provided by other ADB missions to India. These missions mainly followed up on the progress of procurement of equipment for the Project and provided assistance and advice in this regard. The review missions were not effective in ensuring the timely completion of the Project. Overall, ADB performance was less than satisfactory.

66. The implementation performance of the Government was also less than satisfactory. The Government delayed implementation by delaying the issuance of import licenses to the executing agencies for equipment financed under the Project. Delays were also caused by the Government's new procurement policy that required the fragmentation of tender bids to identify components that could be contracted locally. Decision-making in the Government and executing agencies was sluggish.

## **B. Second Telecommunications Project**

67. **Relevance.** The rationale for the Project was also weak and project preparation poor. Project preparation did not include a PPTA and there was no economic or sector work undertaken in advance. The Project and HCL's financial position were inadequately appraised during project formulation. There is no justification for ADB to finance public sector manufacturing, particularly when public policy discourages private sector participation. Moreover, the Government's policy to liberalize and deregulate the sector was vague. The objective of improving commercial and industrial growth through provision of incremental capacity for PIJF cable production was also spurious.

68. **Efficacy.** The objective of the Project to expand and improve the quality of telecommunications services and to improve the efficiency of telecommunications equipment manufacturing was not achieved. The Project created excess capacity in telecommunications equipment manufacturing. To date, the thermo-shrink jointing kit component, the telephone and other cord production component, and the concast copper rod production component are not in use.

69. **Efficiency.** The PIJF cable production component of the second Project was not needed because the private sector installed sufficient capacity to meet the demand for PIJF cable. Moreover, HCL is an inefficient producer of PIJF cable. The thermo-shrink jointing kit component, the telephone and other cord production component, and the concast copper rod production component generate no economic benefits. Therefore, the net economic benefit of the Project is negative. With the large number of private sector companies producing PIJF cable, there is no reason for the public sector to be involved in this area. The Second Telecommunications Project should have been canceled when it became evident that the private sector had the capacity to meet market demand for PIJF cable.

70. **Sustainability.** HCL is technically insolvent and bankrupt and cannot continue operating without Government budgetary support. The Project is not sustainable.

71. **Institutional Development and Other Impacts.** The Project provided three TAs for institutional development. Two of the TAs were subsequently canceled, indicating a poor assessment of institutional needs at TA formulation. The TA that was implemented in DOT could not be assessed because DOT officials were not aware of the TA's impact or the whereabouts of the trainees. Therefore, it may be concluded that the TA was not successful. The Project had no impact on poverty.

72. **Overall Project Rating.** Table 3 summarizes the overall assessment of the Project. The Project is rated as unsuccessful.

**Table 3: Assessment of Overall Project Performance  
Second Telecommunications Project**

Criteria	Assessment	Rating (0-3)	Weight (%)	Weighted Rating
1. Relevance	Irrelevant	0	25	0.00
2. Efficacy	Inefficacious	0	25	0.00
3. Efficiency	Inefficient	0	25	0.00
4. Sustainability	Unlikely	0	15	0.00
5. Institutional Development	Negligible	0	10	0.00
<b>Overall Rating</b>			<b>100</b>	<b>0.00</b>

Rating for relevance: 3=highly relevant; 2=relevant; 1=partly relevant; 0=irrelevant

Rating for efficacy: 3=highly efficacious; 2=efficacious; 1=less efficacious; 0=inefficacious

Rating for efficiency: 3=highly efficient; 2=efficient; 1=less efficient; 0=inefficient

Rating for sustainability: 3=most likely; 2=likely; 1=less likely; 0=unlikely

Rating for institutional development impacts: 3=substantial; 2=moderate; 1=little; 0=negligible

Overall Rating:

HS = highly successful  $2.5 < HS \leq 3.0$

S = successful  $1.6 \leq S \leq 2.5$

LS = less than successful  $0.6 \leq LS < 1.6$

U = unsuccessful  $< 0.6$

73. **Assessment of ADB and Borrower Performance.** The performance of ADB was unsatisfactory. During the implementation of the Project, ADB fielded five review missions. Additional review was also provided by other ADB missions to India. The review missions focused largely on procurement, and did not adequately monitor the more substantive and crucial operational aspects, such as the deterioration in HCL's financial position and the policy environment.

74. The implementation performance of the Government was also not satisfactory. The Government delayed implementation by delaying the issuance of import licenses to the executing agencies for equipment financed under the Project. Decision-making in the Government and executing agencies was also sluggish. The Government was slow in reacting to resolving HCL's problem of insufficient counterpart funds.

## VI. ISSUES, LESSONS AND FOLLOWUP ACTIONS

### A. Key Issues for the Future

75. The telecommunications industry is a rapidly changing one with prices of equipment falling and new technologies becoming available all the time. To keep up with these advances, telecommunications companies need flexibility in their investment decisions and the marketing of their services. It has long been understood that state-owned enterprises, in India and elsewhere, do not have this required flexibility and need to overcome a certain amount of inertia when making decisions. In the Telecommunications Project, this lack of flexibility has resulted in

the installation of some equipment that soon became obsolete. Given the characteristics of this industry and public sector inefficiencies, the public sector is not suited to operate in the telecommunications sector and manage the inherent risks.

76. The Government has maintained high prices for telecommunications services in the face of increasing economies of scale and falling equipment prices. This excess revenue has been transferred to Government coffers in the form of income tax and dividends. In essence, the state-owned telecommunications enterprises in India behave like monopolists. Economic theory suggests that monopolies that keep prices above the competitive level result in net welfare losses. Government policies that encourage this kind of monopoly should not be supported. The appropriate policy initiatives in these circumstances should include privatization and competition in the sector.

77. Recent studies<sup>17</sup> have demonstrated that the expansion of telecommunications into rural areas has significant poverty impacts. An improvement in telecommunications benefits commercially active rural people by improving their access to market information, such as commodity prices, and making it easier to order supplies. This results in higher incomes. Improved telecommunications links also encourage the establishment of service sector businesses, such as tea shops, guest houses, and stores. Rural telecommunications improve the delivery of social services. Reduced isolation encourages teachers and health workers to move to remote areas. Better government administration and banking services have also been attributed to access to telecommunications in rural areas. Governments should encourage the private sector to invest in rural telecommunications.

## **B. Lessons Identified**

78. The evaluation demonstrates the need for a sound project rationale. It should be based on a well-defined and focused country operational strategy, supported by PPTA. A PPTA should be mandatory if there is little or no experience in the sector. Project preparation should include an assessment of the sector's policy environment and the scope for private sector involvement in the sector. Support for interventionist government policies is not appropriate. Project preparation should also assess the institutional capabilities of the executing agency and ensure that sufficient consulting services are provided during project implementation.

79. Project administration needs to closely monitor the policy environment in which a project is being implemented, in addition to its usual activities regarding procurement and other implementation activities. Any major changes should be assessed in light of the project's rationale and objectives, and the economic and financial feasibility of the project should be reassessed to ensure continued relevance. If the rationale is no longer relevant or the project is no longer viable, steps should be taken to terminate the project.

80. Project administration also needs to closely monitor tender evaluation and procurement procedures to ensure that they conform to ADB guidelines. It is not acceptable for an executing agency to fragment bids to identify components that could be contracted by other suppliers. This practice is contrary to ADB guidelines and causes delays in implementation.

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<sup>17</sup> For example, *Rural Telecommunications in Nepal* (October 1998) prepared by Intelcon for the Royal Danish Embassy in Nepal.

**C. Follow-Up Actions**

81. Project administration staff in Infrastructure Department West should assist DTS in fully utilizing the remaining VSAT terminals that are in storage. In particular, DTS should be encouraged to sell these terminals on the same conditions that the private sector does, rather than leasing them. Otherwise, ADB should engage the Government in a dialogue with a view to DTS divesting itself of this component. This may be the better option. The matter should be undertaken immediately to resolve the issue at the earliest possible time.

## APPENDICES

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**PROJECT COSTS AT APPRAISAL AND ACTUAL EXPENDITURES**  
**(Loan 886-IND: Telecommunications Project)**  
(\$ million)

	Appraisal Estimates			Actual Costs		
	Foreign Exchange Cost	Local Currency Cost	Total Cost	Foreign Exchange Cost	Local Currency Cost	Total Cost
<b>A. Computerized Digital Trunk Manual Exchanges (CDTMX) at 8 Sites</b>						
1. Digital Exchanges	22.6	19.3	41.9			
2. Operator Positions	29.1	24.7	53.8			
3. Buildings	—	1.0	1.0			
4. Airconditioning	—	0.2	0.2			
5. Spare Parts	5.2	4.4	9.6			
6. Shipping/Supplier Supervision	6.2	4.8	11.0			
7. Training (180 person-months) <sup>a</sup>	0.9	—	0.9			
<b>Subtotal</b>	<b>64.0</b>	<b>54.4</b>	<b>118.4</b>			
<b>B. Domestic Satellite Facilities at 12 Sites</b>						
1. Low-Noise Amplifiers	0.9	0.2	1.1			
2. Echo Cancellers	2.9	0.7	3.6			
3. Microwave Link Equipment	2.4	0.6	3.0			
4. Power Supply/Aircon/Tower	—	4.2	4.2			
5. Test Equipment	4.0	1.0	5.0			
6. Spare Parts	1.1	0.7	1.8			
7. Shipping/Supplier Supervision	1.2	0.3	1.5			
8. Training (15 person-months) <sup>a</sup>	0.1	—	0.1			
<b>Subtotal</b>	<b>12.6</b>	<b>7.7</b>	<b>20.3</b>			
<b>C. International Gateway Telephone Exchanges (IGTX) (including Phase 1 Calcutta)</b>						
1. 4 New Exchanges	10.6	9.0	19.6			
2. Operator Positions	1.5	1.3	2.8			
3. Echo Cancellers	2.0	1.6	3.6			
4. Power Supply/Aircon/Tower	—	0.4	0.4			
5. Spare Parts	1.4	1.3	2.7			
6. Land and Building	—	0.7	0.7			
7. Shipping/Supplier Supervision	2.9	1.3	4.2			
8. Training (15 person-months) <sup>a</sup>	0.6	—	0.6			
<b>Subtotal</b>	<b>19.0</b>	<b>15.6</b>	<b>34.6</b>			
<b>D. IGTX at Calcutta, Phase 2</b>						
1. New Exchange	2.6	2.2	4.8			
2. Operator Positions	0.3	0.3	0.6			
3. Echo Cancellers	0.4	0.3	0.7			
4. Power Supply/Aircon/Tower	—	0.2	0.2			
5. Spare Parts	0.3	0.3	0.6			
6. Land and Building	—	0.3	0.3			
7. Shipping/Supplier Supervision	0.7	0.3	1.0			
8. Training (30 person-months) <sup>a</sup>	0.2	—	0.2			
<b>Subtotal</b>	<b>4.5</b>	<b>3.9</b>	<b>8.4</b>			
<b>A. CDTMX at 14 Sites</b>						
1. Machinery & Equipment <sup>a</sup> (Exchanges & Training)	17.3	—	17.3			
2. Machinery & Equipment (Operator Positions & Others)	—	2.6	2.6			
3. Civil Works & Installation	—	1.2	1.2			
4. Taxes & Duties	—	11.4	11.4			
<b>Subtotal</b>	<b>17.3</b>	<b>15.2</b>	<b>32.5</b>			
<b>B. Domestic Satellite Facilities at 16 Sites</b>						
1. Low-Noise Amplifiers	0.1	—	0.1			
2. Echo Cancellers	0.7	—	0.7			
3. Microwave Link Equipment	2.6	—	2.6			
4. Up/Down Converter	1.7	—	1.7			
5. RF Spectrum Analyzer	0.2	—	0.2			
6. IDR Modem	2.1	—	2.1			
7. Microwave Link Analyzer	0.4	—	0.4			
8. Spare Parts	0.4	—	0.4			
9. Other Equipment	—	—	—			
<b>Subtotal</b>	<b>8.2</b>	<b>0.0</b>	<b>8.2</b>			
<b>C. VSAT Network Facilities</b>						
1. Machinery & Equipment <sup>a</sup>	4.6	0.9	5.5			
2. Civil Works & Installation	—	0.3	0.3			
3. Taxes & Duties	—	3.8	3.8			
<b>Subtotal</b>	<b>4.6</b>	<b>5.0</b>	<b>9.6</b>			
<b>D. (i) Expansion of IGTX at Delhi, Mumbai, and Chennai, and IGTX at Calcutta, Phase 1</b>						
1. Machinery & Equipment <sup>a</sup> (4 Exchanges & Training)	12.9	—	12.9			
2. Machinery & Equipment (Operator Positions & Others)	—	1.6	1.6			
3. Civil Works & Installation	—	—	—			
4. Taxes & Duties	—	10.8	10.8			
<b>Subtotal</b>	<b>12.9</b>	<b>12.4</b>	<b>25.3</b>			
<b>D. (ii) Expansion of IGTX at Delhi, Mumbai, and Chennai</b>						
1. Machinery & Equipment <sup>a</sup> (3 Exchanges & Training)	7.6	—	7.6			
2. Machinery & Equipment	—	—	—			
3. Civil Works & Installation	—	—	—			
4. Taxes & Duties	—	9.0	9.0			
<b>Subtotal</b>	<b>7.6</b>	<b>9.0</b>	<b>16.6</b>			
<b>Total of D.(i) and D.(ii)</b>	<b>20.5</b>	<b>21.4</b>	<b>41.9</b>			
<b>E. IGTX at Calcutta, Phase 2</b>						
1. Machinery & Equipment <sup>a</sup> (Exchange & Training)	1.8	—	1.8			
2. Machinery & Equipment	—	—	—			
3. Civil Works & Installation	—	—	—			
4. Taxes & Duties	—	1.1	1.1			
<b>Subtotal</b>	<b>1.8</b>	<b>1.1</b>	<b>2.9</b>			

Appraisal Estimates				Actual Costs			
	Foreign Exchange Cost	Local Currency Cost	Total Cost		Foreign Exchange Cost	Local Currency Cost	Total Cost
<b>E. INTELSAT F2-Type Earth Station</b>				<b>E. INTELSAT F2-Type Earth Station at Calcutta</b>			
1. Ground Com. Equipment	0.7	0.6	1.3	1. Machinery & Equipment <sup>a</sup>	0.8	0.7	1.5
2. Antenna/Generator/Power Supply	—	0.5	0.5	2. Civil Works & Installation	—	—	—
3. Spare Parts	0.1	0.1	0.2	3. Taxes & Duties	—	1.1	1.1
4. Shipping/Supplier Supervision	0.1	0.1	0.2	<b>Subtotal</b>	<b>0.8</b>	<b>1.8</b>	<b>2.6</b>
5. Training (15 person-months) <sup>a</sup>	0.1	—	0.1				
<b>Subtotal</b>	<b>1.0</b>	<b>1.3</b>	<b>2.3</b>	<b>G.(i) INTELSAT A-Type Earth Station near Calcutta</b>			
<b>F. INTELSAT A-Type Earth Station near Calcutta</b>				1. Machinery & Equipment <sup>a</sup>	4.7	—	4.7
1. Ground Com. Equipment	1.3	1.1	2.4	2. Civil Works & Installation	—	—	—
2. Antenna/Generator/Power Supply	—	1.5	1.5	3. Taxes & Duties	—	3.8	3.8
3. Microwave Link	0.3	1.6	1.9	<b>Subtotal</b>	<b>4.7</b>	<b>3.8</b>	<b>8.5</b>
4. Spare Parts	0.2	0.5	0.7				
5. Land and Building	—	0.4	0.4	<b>G.(ii) INTELSAT A-Type Earth Station near Chennai</b>			
6. Shipping/Supplier/Supervision	0.3	0.2	0.5	1. Machinery & Equipment <sup>a</sup>	4.7	—	4.7
<b>Subtotal</b>	<b>2.1</b>	<b>5.3</b>	<b>7.4</b>	2. Civil Works & Installation	—	3.9	3.9
				3. Taxes & Duties	—	4.5	4.5
				<b>Subtotal</b>	<b>4.7</b>	<b>8.4</b>	<b>13.1</b>
				<b>Total of G.(i) and G.(ii)</b>	<b>9.4</b>	<b>12.2</b>	<b>21.6</b>
<b>G. INMARSAT Coast Earth Station at Arvi, near Mumbai</b>				<b>H. INMARSAT Coast Earth Station at Arvi, near Mumbai</b>			
1. Ground Com. Equipment	3.6	3.1	6.7	1. Machinery & Equipment <sup>a</sup>	3.7	0.9	3.7
2. Antenna/Generator/Power Supply	0.9	1.0	1.9	2. Civil Works & Installation	—	0.4	0.4
3. Spare Parts	0.5	0.4	0.9	3. Taxes & Duties	—	4.4	4.4
4. Building	—	0.5	0.5	<b>Subtotal</b>	<b>3.7</b>	<b>5.7</b>	<b>9.4</b>
5. Shipping/Supplier/Supervision	1.0	0.4	1.4				
6. Training (15 person-months) <sup>a</sup>	0.1	—	0.1	<b>I.(i) Digital Microwave Link Between Delhi and Dehradun</b>			
<b>Subtotal</b>	<b>6.1</b>	<b>5.4</b>	<b>11.5</b>	1. Machinery & Equipment <sup>a</sup>	1.4	—	1.4
				2. Civil Works & Installation	—	—	—
				3. Taxes & Duties	—	1.2	1.2
				<b>Subtotal</b>	<b>1.4</b>	<b>1.2</b>	<b>2.6</b>
				<b>I.(ii) Digital Microwave Link Between Mumbai and Arvi</b>			
				1. Machinery & Equipment <sup>a</sup>	0.8	—	0.8
				2. Civil Works & Installation	—	—	—
				3. Taxes & Duties	—	0.9	0.9
				<b>Subtotal</b>	<b>0.8</b>	<b>0.9</b>	<b>1.7</b>
				<b>Total of I.(i) and I.(ii)</b>	<b>2.2</b>	<b>2.1</b>	<b>4.3</b>
<b>Subtotal A-G</b>	<b>109.3</b>	<b>93.6</b>	<b>202.9</b>	<b>Subtotal A-I</b>	<b>68.5</b>	<b>64.5</b>	<b>133.0</b>
<b>J. Contingencies</b>				<b>J. Contingencies</b>			
1. Physical Contingencies	5.5	4.7	10.2	1. Physical Contingencies	—	—	—
2. Price Contingencies	1.0	1.7	2.7	2. Price Contingencies	—	—	—
<b>Subtotal</b>	<b>6.5</b>	<b>6.4</b>	<b>12.9</b>	<b>Subtotal</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>K. Interest and Other Charges During Construction</b>	<b>19.2</b>	<b>12.0</b>	<b>31.2</b>	<b>K. Interest and Other Charges During Construction</b>	<b>19.8</b>	<b>—</b>	<b>19.8</b>
<b>Total</b>	<b>135.0</b>	<b>112.0</b>	<b>247.0</b>	<b>Total</b>	<b>88.3</b>	<b>64.5</b>	<b>152.8</b>

**PROJECT COSTS AT APPRAISAL AND ACTUAL EXPENDITURES**  
**(Loan 954-IND: Second Telecommunications Project)**  
(\$ million)

Item	Appraisal Estimate			Actual Cost		
	Foreign Exchange Cost	Local Exchange Cost	Total Cost	Foreign Exchange Cost	Local Exchange Cost	Total Cost
<b>A. PIJF Conversion Components</b>						
1. Conversion from PCUT to PIJF at Rupnarainpur Unit 1						
Machinery and Equipment	12.3	11.1	23.4	9.0	—	9.0
Taxes and Duties <sup>a</sup>	—	—	—	—	5.1	5.1
Civils and Installation	—	0.5	0.5	—	0.2	0.2
<b>Subtotal</b>	<b>12.3</b>	<b>11.6</b>	<b>23.9</b>	<b>9.0</b>	<b>5.3</b>	<b>14.3</b>
2. Conversion from PCUT to PIJF at Rupnarainpur Unit 3						
Machinery and Equipment	10.5	10.0	20.5	6.7	—	6.7
Taxes and Duties <sup>a</sup>	—	—	—	—	4.5	4.5
Civils and Installation	—	0.5	0.5	—	0.2	0.2
<b>Subtotal</b>	<b>10.5</b>	<b>10.5</b>	<b>21.0</b>	<b>6.7</b>	<b>4.7</b>	<b>11.4</b>
3. Conversion from PCUT to PIJF at Hyderabad Unit 1						
Machinery and Equipment	11.9	10.7	22.6	7.3	—	7.3
Taxes and Duties <sup>a</sup>	—	—	—	—	4.3	4.3
Civils and Installation	—	0.7	0.7	—	0.3	0.3
<b>Subtotal</b>	<b>11.9</b>	<b>11.4</b>	<b>23.3</b>	<b>7.3</b>	<b>4.6</b>	<b>11.9</b>
4. Conversion from Coaxial to PIJF at Rupnarainpur Unit						
Machinery and Equipment	9.2	8.3	17.5	6.6	—	6.6
Taxes and Duties <sup>a</sup>	—	—	—	—	5.5	5.5
Civils and Installation	—	0.4	0.4	—	0.1	0.1
<b>Subtotal</b>	<b>9.2</b>	<b>8.7</b>	<b>17.9</b>	<b>6.6</b>	<b>5.6</b>	<b>12.2</b>
<b>Total</b>	<b>43.9</b>	<b>42.2</b>	<b>86.1</b>	<b>29.6</b>	<b>20.2</b>	<b>49.8</b>
<b>B. PIJF Expansion Component</b>						
PIJF Cables at Rupnarainpur New Unit						
Machinery and Equipment	22.2	23.0	45.2	—	—	—
Taxes and Duties <sup>a</sup>	—	—	—	—	—	—
Civils and Installation	—	6.9	6.9	—	—	—
<b>Total</b>	<b>22.2</b>	<b>29.9</b>	<b>52.1</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>C. Thermo-Shrink Jointing Kits</b>						
Machinery and Equipment	4.6	5.4	10.0	3.0	—	3.0
Technical Collaboration	2.0	0.5	2.5	—	—	—
Taxes and Duties <sup>a</sup>	—	—	—	—	—	—
Civils and Installation	—	0.9	0.9	—	—	—
<b>Total</b>	<b>6.6</b>	<b>6.8</b>	<b>13.4</b>	<b>3.0</b>	<b>—</b>	<b>3.0</b>

Item	Appraisal Estimate			Actual Cost		
	Foreign	Local	Total Cost	Foreign	Local	Total Cost
	Exchange	Exchange		Exchange	Exchange	
Cost	Cost	Cost	Cost	Cost		
<b>D. Telephone Cords</b>						
Machinery and Equipment	1.5	1.6	3.1	2.4	—	2.4
Technical Collaboration	0.1	—	0.1	—	—	—
Taxes and Duties <sup>a</sup>	—	—	—	—	1.0	1.0
Civils and Installation	—	0.5	0.5	—	—	—
<b>Total</b>	<b>1.6</b>	<b>2.1</b>	<b>3.7</b>	<b>2.4</b>	<b>1.0</b>	<b>3.4</b>
<b>E. Concast Copper Rod</b>						
Machinery and Equipment	—	—	—	2.9	—	2.9
Taxes and Duties <sup>a</sup>	—	—	—	—	1.2	1.2
Civils and Installation	—	—	—	—	0.1	0.1
<b>Total</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>2.9</b>	<b>1.3</b>	<b>4.2</b>
<b>F. Research and Development</b>						
Equipment	1.6	2.6	4.2	0.6	—	0.6
Taxes and Duties <sup>a</sup>	—	—	—	—	0.2	0.2
Civils and Installation	—	0.3	0.3	—	—	—
<b>Total</b>	<b>1.6</b>	<b>2.9</b>	<b>4.5</b>	<b>0.6</b>	<b>0.2</b>	<b>0.7</b>
<b>G. Raw Materials</b>						
Raw Materials	14.6	18.3	32.9	17.5	—	17.5
Taxes and Duties <sup>a</sup>	—	—	—	—	11.0	11.0
Civils and Installation	—	—	—	—	—	—
<b>Total</b>	<b>14.6</b>	<b>18.3</b>	<b>32.9</b>	<b>17.5</b>	<b>11.0</b>	<b>28.5</b>
<b>Subtotal (A to G)</b>	<b>90.5</b>	<b>102.2 <sup>b</sup></b>	<b>192.7</b>	<b>56.0</b>	<b>33.7</b>	<b>89.6</b>
<b>H. Contingencies</b>						
Physical	4.5	5.1	9.6	—	—	—
Price	6.2	8.9	15.1	—	—	—
<b>Total</b>	<b>10.7</b>	<b>14.0</b>	<b>24.7</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>I. IDC</b>	<b>16.8</b>	<b>19.8</b>	<b>36.6</b>	<b>12.0</b>	<b>—</b>	<b>12.0</b>
<b>Total</b>	<b>118.0</b>	<b>136.0</b>	<b>254.0</b>	<b>68.0</b>	<b>33.7</b>	<b>101.6</b>

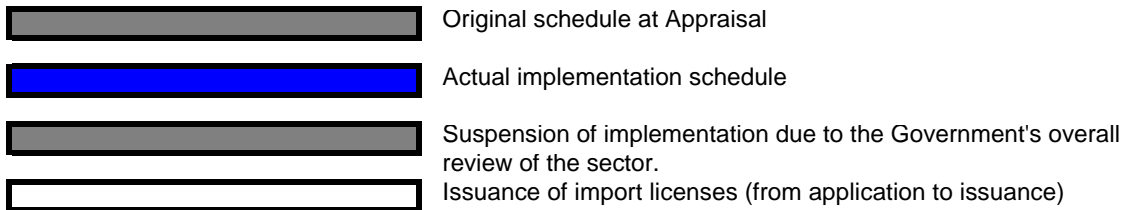
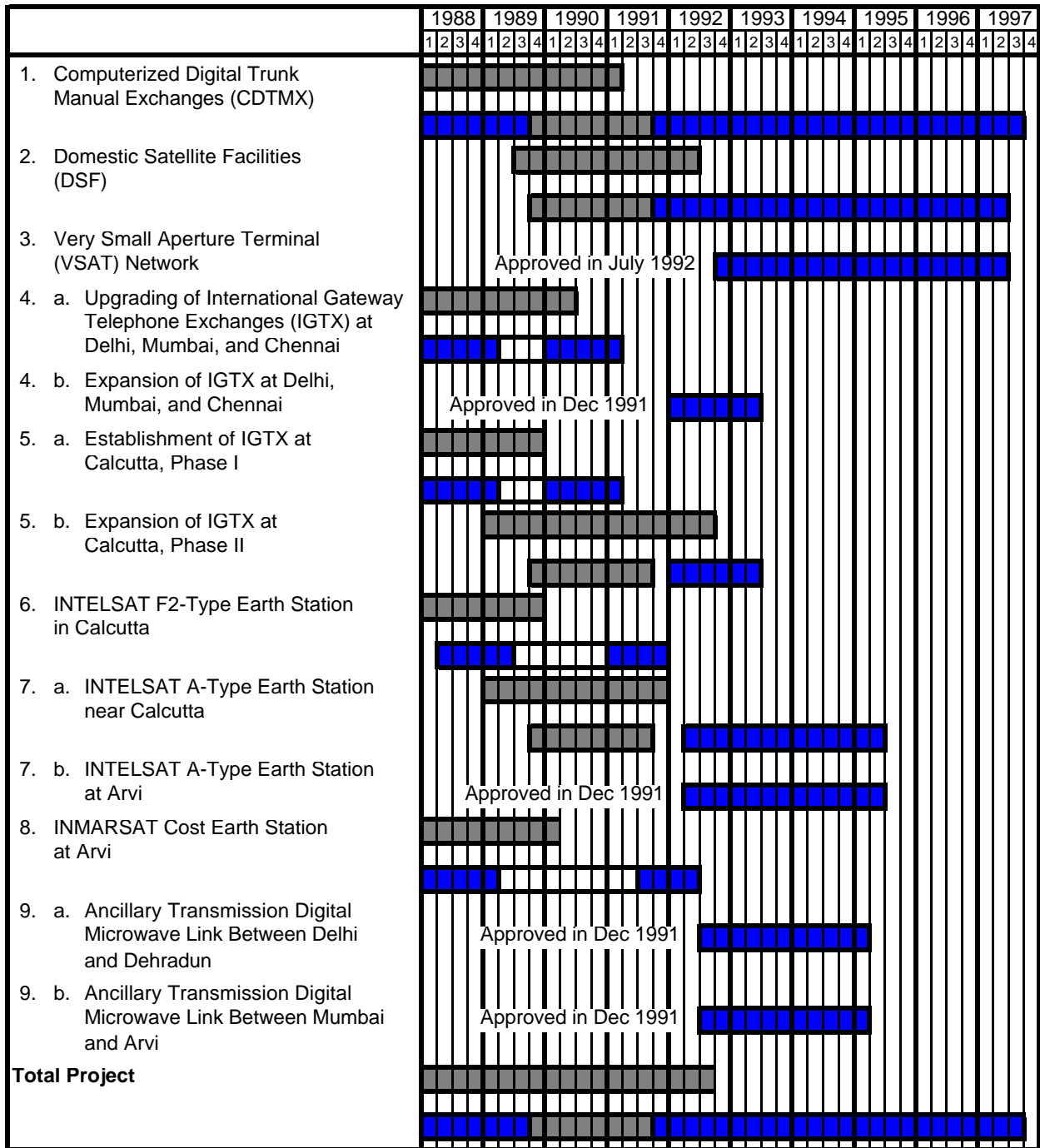
— = magnitude zero

IDC = interest during construction; PCUT = paper cut unit twin; and PIJF = polyethylene insulated jelly-filled.

<sup>a</sup> At appraisal, taxes and duties were included in "civils and installation".

<sup>b</sup> Subtotal comprised taxes and duties of \$83.7 million, civil works of \$10.7 million and indigenous equipment of \$7.8 million.

**PROJECT IMPLEMENTATION SCHEDULE  
(Loan 886-IND: Telecommunications Project)**





**COMPLIANCE WITH LOAN COVENANTS  
(Loan 668-IND: Telecommunications Project)**

Covenant	Reference to Loan Agreement	Status of Compliance
<b>Financial Covenants</b>		
1. The Borrower will maintain, or ensure maintenance of, records and accounts adequate to identifying the goods, services, and other items of expenditure financed through the loan, and to reflect the operations and financial condition of Department of Telecommunications (DOT), Mahanagar Telephone Nigam Limited (MTNL), and Videsh Sanchar Nigam Limited (VSNL).	Loan Agreement (LA), Section (Sec) 4.06 (a)	Complied with.
2. The Borrower will furnish to the Asian Development Bank (ADB), as soon as available but not later than nine months after the end of each related fiscal year, certified copies of such audited accounts and financial statements and the reports of the auditors relating thereto.	LA, Sec. 4.06 (b)	Delayed compliance. Most of audited financial statements were submitted more than nine months after fiscal year.
3. The Borrower will ensure that DOT and MTNL take all measures required to realize an annual rate of return on a consolidated basis of not less than 11 percent of the average net value of DOT's and MTNL's fixed assets in operation.	LA, Schedule (Sch) 5, Para. 4	Complied with.
4. The Borrower will ensure that VSNL produces funds from internal sources equivalent to not less than 50 percent of the annual average of VSNL's capital expenditures incurred for that year, and the previous fiscal year, and expected to be incurred for the next fiscal year.	LA, Sch. 5, Para. 6	Complied with.
<b>Other Covenants</b>		
5. Overall coordination and monitoring of the Project will be carried out by the director, coordination and planning, in DOT, who will also be responsible for the implementation of the DOT components. The MTNL component will be implemented under the supervision of the general manager (technical), MTNL. For the VSNL components, implementation will be supervised by the general manager (switching and planning), VSNL.	LA, Sch. 5, Para. 2	Complied with.

Covenant	Reference to Loan Agreement	Status of Compliance
6. The Borrower will ensure that quarterly reports are furnished to ADB on the implementation of the Project, and the operation and management of the project facilities.	LA, Sec. 4.07 (b)	Partially complied with. DOT and MTNL did not consistently furnish the quarterly reports.
7. The Borrower will prepare and furnish to ADB a report on the execution and initial operation of the Project, promptly after physical completion of the Project, but in any event not later than four months thereafter.	LA, Sec. 4.07 (c)	Partially complied with. The report on DOT and MTNL components has not been furnished to ADB.
8. The Borrower will ensure that the executing agencies monitor productivity and quality of service indicators covering physical, efficiency, and financial targets that have been agreed with ADB, and forward the details of compliance with such indicators annually to ADB.	LA, Sch. 5, Para. 7	Complied with.
9. The Borrower will ensure that VSNL utilizes the international gateway telephone exchange equipment at Calcutta provided under Phase 1 at another location.	LA, Sch. 5, Para. 10	Not applicable, since the equipment is utilized at Calcutta.

**COMPLIANCE WITH LOAN COVENANTS**  
**(Loan 954-INO: Second Telecommunications Project)**

Covenant	Reference to Loan Agreement	Status of Compliance
<b>Financial Covenants</b>		
1. Hindustan Cables Limited (HCL) will maintain an annual rate of return on capital employed of not less than 13 percent.	Loan Agreement (LA), Schedule (Sch) 5, Para. 2 (a) and Project Agreement (PA)	Not complied with.
2. The financial covenant referred to in para. 2, Sch. 5, LA will be applicable until the Seventh Pricing Agreement between DOT and HCL is amended or terminated, at which time the Borrower, HCL, and ADB will review HCL's financial condition and agree on an appropriate financial target for HCL.	LA, Sch. 5, Para. 3	Not complied with.
3. The requirements set forth in para. 3, Sch. 5, LA will be reviewed if necessary from time to time between the Borrower, HCL and ADB.	LA, Sch. 5, Para. 4	Not complied with.
4. HCL will maintain separate accounts for the Project and its overall operations, have the accounts audited annually, and furnish to ADB, not later than six months after the close of the fiscal year, certified copies of such audited accounts and financial statements.	PA, Sec. 2.09.	Complied with.
<b>Other Covenants</b>		
5. The Project will be implemented under the overall coordination, control, and monitoring of the chairman-cum-managing director of HCL, who will be assisted by the director (technical and planning).	LA, Sch. 5, Para. 1	Complied with.
6. The Borrower will ensure that the agreed DOT plan of expanding competition in the domestic procurement of telecommunications equipment is carried out, and will inform ADB annually of progress in this regard.	LA, Sch. 5, Para. 5	Complied with.
7. HCL will carry out the agreed HCL plan, in accordance with the time schedule set forth therein, with respect to its manpower policy, cost accounting, and factory layout in order to strengthen its productivity and efficiency and will inform ADB annually of progress in this regard.	LA, Sch. 5, Para. 6	Partially complied with. Cable production, productivity, and accounts receivable were below the target.

	Covenant	Reference to Loan Agreement	Status of Compliance
8.	HCL will take all necessary measures to ensure that it complies at all times with the environmental and pollution control laws applicable in India.	LA, Sch. 5, Para. 7	Complied with.
9.	HCL will furnish to ADB quarterly reports on the execution of the Project, and on the operation and management of the project facilities.	PA, Sec. 2.08. (b)	Complied with.
10.	HCL will prepare and furnish to ADB a project completion report not later than three months after physical completion of the Project.	PA, Sec. 2.08. (c)	Complied with. The report was submitted although three components are yet to be completed.

## DEVELOPMENT OF TELECOMMUNICATIONS SERVICES

**Table A7.1: Domestic Services**

Item	Fiscal Year Ending 31 March										
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>I. Network and Traffic Expansion</b>											
A. Direct Exchange Lines ('000)											
DOT	3,149	3,478	3,855	4,414	5,210	6,176	7,587	9,370	11,531	14,395	17,940
MTNL	1,018	1,112	1,220	1,396	1,587	1,850	2,208	2,608	3,012	3,407	3,654
<b>Total</b>	<b>4,167</b>	<b>4,590</b>	<b>5,075</b>	<b>5,810</b>	<b>6,797</b>	<b>8,026</b>	<b>9,795</b>	<b>11,978</b>	<b>14,543</b>	<b>17,802</b>	<b>21,594</b>
Percentage Increase	9.9	10.2	10.6	14.5	17.0	18.1	22.1	22.3	21.4	22.4	21.3
B. Number of Telephone Metered Call Units (billion)	20.3	21.5	23.9	30.6	40.1	46.7	58.6	78.4	93.3	117.7	146.6
C. Manual Trunk Call Traffic (million)	204	220	224	206	206	162	122	76	68	56	49
Percentage Increase	—	7.8	1.8	-8.0	0.0	-21.4	-24.7	-37.4	-10.5	-17.6	-12.5
<b>II. Productivity</b>											
A. Number of Staff ('000)											
DOT	312	320	326	322	331	335	358	358	358	362	362
MTNL	50	50	49	51	54	60	61	63	63	63	62
<b>Total</b>	<b>362</b>	<b>370</b>	<b>375</b>	<b>373</b>	<b>385</b>	<b>395</b>	<b>419</b>	<b>421</b>	<b>421</b>	<b>425</b>	<b>424</b>
B. Staff per 1,000 DELs											
DOT	99	92	85	73	64	54	47	38	31	25	20
MTNL	49	45	40	37	34	32	28	24	21	18	17
<b>Total</b>	<b>87</b>	<b>81</b>	<b>74</b>	<b>64</b>	<b>57</b>	<b>49</b>	<b>43</b>	<b>35</b>	<b>29</b>	<b>24</b>	<b>20</b>
C. Faults/100 Stations/Month	21.2	19.9	18.5	19.1	18.2	18.3	17.9	15.8	17.2	17.4	16.4

— = nil.

DEL = direct exchange lines; DOT = Department of Telecommunications; MTNL = Mahanagar Telephone Nigam Limited.

Source: DOT and MTNL annual reports.

**Table A7. 2: International Services**

Item	Fiscal Year Ending 31 March											
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	
<b>I. IGTX Capacity and Traffic</b>												
A. International Telephone Traffic												
1. Annual Paid Minutes (million minutes)	235.2	306.6	369.4	473.9	614.2	742.8	942.0	1,147.6	1,384.9	1,684.5	1,945.0	
B. Traffic Handling Capacity												
1. Number of Circuits	1,993	1,993	2,323	4,513	11,053	15,703	15,703	15,393	23,899	25,560	25,560	
2. Capacity in Annual Minutes <sup>a</sup> (million minutes)	178.9	178.9	208.5	405.0	992.0	1,409.3	1,409.3	1,381.5	2,144.9	2,294.0	2,294.0	
<b>II. Performance Indicators for VSNL</b>												
A. Telephone Paid Minutes (million)	235.30	306.56	369.44	473.90	614.20	742.82	942.00	1,147.56	1,384.90	1,684.51	1,935.01	
B. Telex Paid Minutes (million)	51.80	50.83	47.00	42.10	38.67	30.99	24.19	20.40	17.35	14.02	11.06	
C. Television Traffic (minutes)	48,621	47,780	48,314	70,955	55,748	62,159	99,811	116,683	143,050	185,930	92,530	
D. Data Transmission ('000 minutes)	0	541	989	1,977	3,522	4,868	8,673	7,725	7,982	8,920	7,929	
E. INMARSAT Traffic												
Telephone ('000 minutes)	0	0	0	0	754	1,808	2,250	2,597	3,307	2,660	1,961	
Telex ('000 minutes)	0	0	0	0	347	770	930	983	878	807	272	
F. Telephone Circuits	—	—	2,109	3,331	4,789	8,520	11,525	12,873	14,184	15,431	17,922	
G. Telex Circuits	—	—	1,143	1,124	936	1,039	1,064	1,128	1,081	1,012	787	
H. Satellite Circuits	1,252	1,434	1,430	2,465	3,749	6,937	7,702	8,573	9,200	9,266	10,609	
I. Cable Circuits	654	615	679	866	1,040	1,583	3,781	4,300	4,964	6,165	7,313	
J. Total Staff	2,990	2,880	2,798	2,757	2,852	2,806	2,769	2,814	2,873	2,861	2,975	

— = not available.

IGTX = international gateway telephone exchange; INMARSAT = International Maritime Satellite Organization; VSNL = Videsh Sanchar Nigam Limited.

<sup>a</sup> Calculation assumes: 90 calls/circuit/day, 2.77 minutes/call, 360 days/year.

Source: VSNL annual reports.

## HCL PRODUCTION HISTORY OF CABLES

Fiscal Year Ending 31 March	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
A. PIJF Cables (million conductor kilometers)												
1. Rupnarainpur Unit												
a. Original Facilities (listed capacity: 1.6)	0.6	0.4	0.4	0.5	1.3	1.1	1.4	0.4	—	—	—	—
b. Project Facilities												
i. Coaxial to PIJF (listed capacity: 0.6)	0	0	0	0	0.2	0.6	0.8	0.2	—	—	—	—
ii. PCUT to PIJF Unit 1 (listed capacity: 0.8)	0	0	0	0	0	0	0.8 <sup>a</sup>	0.3 <sup>a</sup>	—	—	—	—
iii. PCUT to PIJF Unit 3 (listed capacity: 0.8)	0	0	0	0	0	0	0	0	—	—	—	—
<b>Subtotal of Project Facilities</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.2</b>	<b>0.6</b>	<b>1.6</b>	<b>0.6</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>
<b>Total of Rupnarainpur Unit</b>	<b>0.6</b>	<b>0.4</b>	<b>0.4</b>	<b>0.5</b>	<b>1.4</b>	<b>1.7</b>	<b>3.0</b>	<b>0.9</b>	<b>0.6</b>	<b>0.3</b>	<b>0.4</b>	<b>3.8</b>
2. Hyderabad Unit												
a. Original Facilities												
i. Unit 1 (listed capacity 0.5)	0.6	0.2	0.1	0.1	0.4	0.5	0	0	0	0	0	0
ii. Unit 2 (listed capacity 3.0)	2.5	1.6	1.4	0.8	2.1	2.2	2.8	1.4	2.0	—	—	—
b. Project Facilities												
i. PCUT to PIJF Unit 1 (listed capacity: 0.9)	0	0	0	0	0	0	0.7	0.4	1.0	—	—	—
<b>Total of Hyderabad Unit</b>	<b>3.1</b>	<b>1.8</b>	<b>1.5</b>	<b>0.9</b>	<b>2.5</b>	<b>2.7</b>	<b>3.5</b>	<b>1.8</b>	<b>3.0</b>	<b>1.6</b>	<b>0.8</b>	<b>4.6</b>
3. Total Production												
a. Original Facilities	3.7	2.2	1.9	1.4	3.8	3.8	4.2	1.7	—	—	—	—
b. Project Facilities	0	0	0	0	0.2	0.6	2.3	1.0	—	—	—	—
<b>Total Production of PIJF Cables</b>	<b>3.7</b>	<b>2.2</b>	<b>1.9</b>	<b>1.4</b>	<b>3.9</b>	<b>4.4</b>	<b>6.5</b>	<b>2.7</b>	<b>3.6</b>	<b>1.9</b>	<b>1.2</b>	<b>8.4</b>
4. Listed Production Capacity												
a. Original Facilities	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
b. Project Facilities	0	0	0	0	0.6	0.6	3.1	3.1	3.1	3.1	3.1	3.1
<b>Total Production Capacity</b>	<b>5.1</b>	<b>5.1</b>	<b>5.1</b>	<b>5.1</b>	<b>5.7</b>	<b>5.7</b>	<b>8.2</b>	<b>8.2</b>	<b>8.2</b>	<b>8.2</b>	<b>8.2</b>	<b>8.2</b>

— = not available.

PCUT = paper covered unit twin; PIJF = polyethylene insulated jelly filled.

<sup>a</sup> Total production of unit 1 and unit 3.

Source: Department of Telecommunications.

## DEPARTMENT OF TELECOMMUNICATIONS' FINANCIAL STATEMENTS

**Table A9.1: Income Statements**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>A. Operating Revenue</b>	23,590	27,770	34,590	39,980	46,940	62,680	76,540	96,760	121,839	145,903	176,375
<b>B. Operating Expenses</b>											
Staff Expenses	8,550	9,420	10,350	11,580	12,350	13,590	15,370	18,000	22,614	31,400	35,191
Operating Cost	2,140	2,360	2,590	2,890	3,090	3,400	3,840	4,500	9,416	7,850	8,798
Depreciation	2,360	3,020	3,880	4,910	6,400	7,760	9,760	12,230	15,244	18,323	21,866
<b>Total Operating Expenses</b>	<b>13,050</b>	<b>14,800</b>	<b>16,820</b>	<b>19,380</b>	<b>21,840</b>	<b>24,750</b>	<b>28,970</b>	<b>34,730</b>	<b>47,274</b>	<b>57,573</b>	<b>65,855</b>
<b>C. Operating Income</b>	10,540	12,970	17,770	20,600	25,100	37,930	47,570	62,030	74,584	88,330	110,520
<b>D. Other Income</b>	1,520	1,640	1,100	1,130	3,510	3,940	5,110	6,560	7,929	7,263	7,121
<b>E. Interest Expense</b>	2,490	3,110	3,980	4,630	6,660	15,030	12,920	12,020	20,428	13,482	11,221
<b>F. Net Income</b>	9,570	11,500	14,890	17,100	21,950	26,840	39,760	56,570	62,085	82,111	106,420
<b>G. Operating Ratio</b>	55.3%	53.3%	48.6%	48.5%	46.5%	39.5%	37.8%	35.9%	38.8%	40.4%	38.0%
<b>H. Return on Fixed Assets</b>	24.8%	23.2%	24.7%	22.9%	21.7%	24.8%	24.1%	25.4%	24.7%	24.0%	25.0%

Source: Department of Telecommunications annual reports.

**Table A9.2: Balance Sheets**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>A. Assets</b>											
Current Assets											
Cash/Bank	5,060	5,300	5,690	6,220	6,210	7,860	8,350	2,760	—	—	—
Accounts Receivable	5,300	6,170	7,530	9,710	12,500	16,700	20,080	25,650	28,552	33,734	38,911
Inventories	1,870	2,970	3,910	2,880	3,270	3,110	3,080	3,670	3,856	4,714	5,171
<b>Total Current Assets</b>	<b>12,230</b>	<b>14,440</b>	<b>17,130</b>	<b>18,810</b>	<b>21,980</b>	<b>27,670</b>	<b>31,510</b>	<b>32,080</b>	<b>32,408</b>	<b>38,448</b>	<b>44,082</b>
Fixed Assets											
Gross Fixed Assets	76,040	96,190	117,990	145,440	183,910	230,810	288,180	359,350	433,098	517,946	610,817
Accumulated Depreciation	11,740	14,350	17,900	22,380	28,230	35,450	44,430	55,520	69,209	85,919	106,153
<b>Net Fixed Assets</b>	<b>64,300</b>	<b>81,840</b>	<b>100,090</b>	<b>123,060</b>	<b>155,680</b>	<b>195,360</b>	<b>243,750</b>	<b>303,830</b>	<b>363,889</b>	<b>432,027</b>	<b>504,664</b>
Investment in MTNL	8,620	8,570	8,370	8,170	7,950	7,740	7,520	7,300	27,693	28,298	28,255
<b>Total Assets</b>	<b>85,150</b>	<b>104,850</b>	<b>125,590</b>	<b>150,040</b>	<b>185,610</b>	<b>230,770</b>	<b>282,780</b>	<b>343,210</b>	<b>423,990</b>	<b>498,773</b>	<b>577,001</b>
<b>B. Liabilities</b>											
Current Liabilities											
Accounts Payable	2,060	2,240	2,370	2,810	3,470	4,250	4,470	5,290	6,149	7,224	8,785
<b>Total Current Liabilities</b>	<b>2,060</b>	<b>2,240</b>	<b>2,370</b>	<b>2,810</b>	<b>3,470</b>	<b>4,250</b>	<b>4,470</b>	<b>5,290</b>	<b>6,149</b>	<b>7,224</b>	<b>8,785</b>
<b>C. Capital/Fund</b>											
Retained Earnings	49,810	66,370	84,850	108,010	142,600	186,070	236,740	301,440	363,532	374,185	475,019
Borrowed Funds	29,550	32,150	33,870	34,260	34,530	35,430	35,430	35,430	35,427	97,500	73,737
Telecom Capital Fund	3,730	4,090	4,500	4,960	5,010	5,020	6,140	1,050	18,882	19,864	19,460
<b>Total Capital/Fund</b>	<b>83,090</b>	<b>102,610</b>	<b>123,220</b>	<b>147,230</b>	<b>182,140</b>	<b>226,520</b>	<b>278,310</b>	<b>337,920</b>	<b>417,841</b>	<b>491,549</b>	<b>568,216</b>
<b>Liabilities and Capital</b>	<b>85,150</b>	<b>104,850</b>	<b>125,590</b>	<b>150,040</b>	<b>185,610</b>	<b>230,770</b>	<b>282,780</b>	<b>343,210</b>	<b>423,990</b>	<b>498,773</b>	<b>577,001</b>
<b>D. Debt/Equity Ratio</b>	59.3%	48.4%	39.9%	31.7%	24.2%	19.0%	15.0%	11.8%	9.3%	24.7%	14.9%

Source: Department of Telecommunications annual reports.

**Table A9.3: Sources and Applications of Funds**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>A. Sources of Funds</b>											
Net Income	9,570	11,500	14,890	17,100	21,950	26,840	39,760	56,570	62,085	82,111	106,420
Depreciation	2,360	3,020	3,880	4,920	6,400	7,760	9,760	12,230	15,244	18,323	21,866
Other Sources	2,490	3,110	3,980	4,630	6,660	15,030	12,920	12,020	18,050	4,474	(18,489)
<b>Total Internal Sources</b>	<b>14,420</b>	<b>17,630</b>	<b>22,750</b>	<b>26,650</b>	<b>35,010</b>	<b>49,630</b>	<b>62,440</b>	<b>80,820</b>	<b>95,379</b>	<b>104,908</b>	<b>109,797</b>
Borrowed Funds (Net)	380	2,590	3,830	390	270	890	0	0	0	0	0
<b>Total Sources</b>	<b>14,800</b>	<b>20,220</b>	<b>26,580</b>	<b>27,040</b>	<b>35,280</b>	<b>50,520</b>	<b>62,440</b>	<b>80,820</b>	<b>95,379</b>	<b>104,908</b>	<b>109,797</b>
<b>B. Applications of Funds</b>											
Capital Expenditure	16,570	20,710	22,140	27,880	39,020	47,440	58,160	72,310	75,302	86,461	94,503
Debt Service	2,490	3,110	3,980	4,630	6,660	15,030	12,920	12,020	20,428	13,482	11,221
Increase/Decrease in Working Capital	(4,560)	(3,840)	70	(6,000)	(10,390)	(13,610)	(9,130)	(250)	(531)	4,965	4,073
<b>Total Applications</b>	<b>14,500</b>	<b>19,980</b>	<b>26,190</b>	<b>26,510</b>	<b>35,290</b>	<b>48,860</b>	<b>61,950</b>	<b>84,080</b>	<b>95,199</b>	<b>104,908</b>	<b>109,797</b>
<b>C. Increase/Decrease in Cash</b>	300	240	390	530	(10)	1,660	490	(3,260)	180	0	0
<b>D. Debt-Service Ratio</b>	5.8	5.7	5.7	5.8	5.3	3.3	4.8	6.7	4.1	8.4	12.4

Source: Department of Telecommunications annual reports.

**MAHANAGAR TELEPHONE NIGAM LIMITED FINANCIAL STATEMENTS**

**Table A10.1: Income Statements**

(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>A. Operating Revenue</b>											
Telephone	9,176	10,326	11,786	14,214	17,134	23,848	28,301	33,422	39,128	45,433	49,238
Telex	778	728	817	792	727	635	535	444	361	267	216
Circuits	329	468	497	547	489	593	633	615	820	846	871
<b>Total Operating Revenue</b>	<b>10,283</b>	<b>11,522</b>	<b>13,100</b>	<b>15,553</b>	<b>18,350</b>	<b>25,076</b>	<b>29,469</b>	<b>34,481</b>	<b>40,309</b>	<b>46,546</b>	<b>50,325</b>
<b>B. Operating Expenses</b>											
1. Personnel	1,133	1,177	1,367	1,677	1,848	2,167	2,495	3,128	4,284	5,167	6,165
2. a. Use of National Network	2,269	2,578	3,533	3,477	4,101	5,494	6,337	7,613	8,823	10,240	10,912
b. Levy/License Fee	771	1,609	1,570	450	0	1,249	1,480	1,986	2,347	2,711	3,066
3. Operation and Maintenance	0	0	0	0	629	784	1,046	1,040	1,557	1,731	1,945
4. Administration	1,068	1,111	1,349	1,867	1,789	2,114	2,378	2,656	3,211	4,502	4,307
5. Depreciation	1,619	1,929	2,482	3,109	3,790	3,998	4,290	4,654	5,150	5,856	6,571
<b>Total Operating Expenses</b>	<b>6,860</b>	<b>8,404</b>	<b>10,301</b>	<b>10,580</b>	<b>12,157</b>	<b>15,806</b>	<b>18,026</b>	<b>21,077</b>	<b>25,372</b>	<b>30,207</b>	<b>32,966</b>
<b>C. Operating Income</b>	<b>3,423</b>	<b>3,118</b>	<b>2,799</b>	<b>4,973</b>	<b>6,193</b>	<b>9,270</b>	<b>11,443</b>	<b>13,404</b>	<b>14,937</b>	<b>16,339</b>	<b>17,359</b>
<b>D. Interest on Bonds and Long-Term Loans</b>	<b>529</b>	<b>750</b>	<b>949</b>	<b>1,457</b>	<b>1,637</b>	<b>1,607</b>	<b>1,686</b>	<b>1,629</b>	<b>1,476</b>	<b>866</b>	<b>729</b>
<b>E. Nonoperating Income (Net)</b>	<b>187</b>	<b>201</b>	<b>80</b>	<b>246</b>	<b>257</b>	<b>140</b>	<b>682</b>	<b>705</b>	<b>653</b>	<b>1,247</b>	<b>2,268</b>
<b>F. Income before Tax</b>	<b>3,081</b>	<b>2,569</b>	<b>1,930</b>	<b>3,762</b>	<b>4,813</b>	<b>7,803</b>	<b>10,439</b>	<b>12,480</b>	<b>14,114</b>	<b>16,720</b>	<b>18,898</b>
<b>G. Tax</b>	<b>560</b>	<b>770</b>	<b>900</b>	<b>2,050</b>	<b>2,730</b>	<b>4,362</b>	<b>4,674</b>	<b>5,185</b>	<b>5,493</b>	<b>5,247</b>	<b>6,016</b>
<b>H. Dividend</b>	<b>840</b>	<b>840</b>	<b>360</b>	<b>360</b>	<b>480</b>	<b>600</b>	<b>600</b>	<b>1,200</b>	<b>1,200</b>	<b>1,827</b>	<b>1,890</b>
<b>I. Retained Profit</b>	<b>1,681</b>	<b>959</b>	<b>670</b>	<b>1,352</b>	<b>1,603</b>	<b>2,841</b>	<b>5,165</b>	<b>6,095</b>	<b>7,421</b>	<b>9,646</b>	<b>10,992</b>

Source: Mahanagar Telephone Nigam Limited annual reports.

**Table A10.2: Balance Sheets**  
(Year Ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>A. Assets</b>											
1. Gross Fixed Assets	15,057	18,060	23,149	28,856	35,047	42,025	48,720	60,110	69,856	80,581	89,461
2. Accumulated Depreciation	3,897	5,821	8,265	11,369	15,188	19,226	23,164	27,445	31,611	37,100	42,997
3. Net Fixed Assets	11,160	12,239	14,884	17,487	19,859	22,799	25,556	32,665	38,245	43,481	46,464
4. Capital Work in Progress	2,594	4,396	4,135	4,073	4,764	6,154	9,436	7,882	7,812	6,213	7,106
5. Investment	0	0	874	2,000	1,500	0	0	0	0	0	0
6. Loans and Advances <sup>a</sup>											
a. Loan to Government	10,500	15,500	17,220	23,240	35,670	46,756	56,486	59,328	70,333	62,723	37,960
b. Others	2,214	2,312	4,470	5,533	14,856	14,173	7,325	8,801	13,698	13,547	16,981
<b>Subtotal</b>	<b>26,468</b>	<b>34,447</b>	<b>41,583</b>	<b>52,333</b>	<b>76,649</b>	<b>89,882</b>	<b>98,803</b>	<b>108,676</b>	<b>130,088</b>	<b>125,964</b>	<b>108,511</b>
7. Current Assets											
a. Cash and Deposits	346	462	1,054	3,478	1,475	2,790	2,764	3,061	3,721	13,285	13,564
b. Accounts Receivable											
i. Sundry Debtors	963	1,313	1,780	2,618	3,312	4,088	4,639	5,409	6,223	6,106	6,549
ii. Income Accrued	1,234	1,434	1,731	2,489	2,484	3,233	3,715	4,130	4,310	5,391	5,886
iii. Others Accrued	2	3	42	1	27	1	0	2	0	0	0
Total Accounts Receivable	2,199	2,750	3,553	5,108	5,823	7,322	8,354	9,541	10,533	11,497	12,435
c. Inventories	1,771	2,140	2,301	1,450	2,217	1,992	2,821	2,312	2,457	2,558	2,274
<b>Subtotal</b>	<b>4,316</b>	<b>5,352</b>	<b>6,908</b>	<b>10,036</b>	<b>9,515</b>	<b>12,104</b>	<b>13,939</b>	<b>14,914</b>	<b>16,711</b>	<b>27,340</b>	<b>28,273</b>
<b>Total Assets</b>	<b>30,784</b>	<b>39,799</b>	<b>48,491</b>	<b>62,369</b>	<b>86,164</b>	<b>101,986</b>	<b>112,742</b>	<b>123,590</b>	<b>146,799</b>	<b>153,304</b>	<b>136,784</b>
<b>B. Equity and Liabilities</b>											
1. Share Capital - Paidup	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,300	6,300
2. Retained Earnings	2,679	3,638	4,309	5,661	7,265	10,107	15,273	21,368	29,376	45,318	56,193
<b>Subtotal</b>	<b>8,679</b>	<b>9,638</b>	<b>10,309</b>	<b>11,661</b>	<b>13,265</b>	<b>16,107</b>	<b>21,273</b>	<b>27,368</b>	<b>35,376</b>	<b>51,618</b>	<b>62,493</b>
3. Telephone Bonds	11,336	18,334	23,681	35,416	37,835	52,431	59,195	62,786	73,614	64,216	38,136
4. Government Loans											
a. IBRD Project	162	455	559	580	536	492	441	391	342	277	242
b. ADB Project	0	0	0	0	0	0	0	0	0	0	0
c. Other	2,600	2,819	2,869	2,170	10,505	4,736	7,267	6,303	2,085	1,000	0
<b>Subtotal</b>	<b>2,762</b>	<b>3,274</b>	<b>3,428</b>	<b>2,750</b>	<b>11,041</b>	<b>5,228</b>	<b>7,708</b>	<b>6,694</b>	<b>2,427</b>	<b>1,277</b>	<b>242</b>
5. Subscriber Deposits	2,577	3,162	3,656	4,399	5,323	6,216	7,713	8,724	9,686	10,497	10,925
6. Current Liabilities											
a. Accounts Payable	1,132	713	968	479	8,744	9,840	1,678	895	794	1,333	429
b. Advance Rentals	86	103	139	146	177	187	288	443	428	425	485
c. Income Tax Provision	16	123	1,664	2,050	2,730	4,363	4,674	5,185	10,667	10,630	11,153
d. Dividend Provision	840	840	360	360	480	600	600	1,200	1,200	1,827	1,890
e. Other	3,356	3,612	4,286	5,108	6,569	7,014	9,613	10,295	12,607	11,481	11,032
<b>Subtotal</b>	<b>5,430</b>	<b>5,391</b>	<b>7,417</b>	<b>8,143</b>	<b>18,700</b>	<b>22,004</b>	<b>16,853</b>	<b>18,018</b>	<b>25,696</b>	<b>25,696</b>	<b>24,989</b>
<b>Total Equity and Liabilities</b>	<b>30,784</b>	<b>39,799</b>	<b>48,491</b>	<b>62,369</b>	<b>86,164</b>	<b>101,986</b>	<b>112,742</b>	<b>123,590</b>	<b>146,799</b>	<b>153,304</b>	<b>136,785</b>

<sup>a</sup> Bond funds transferred to the Government for assisting in Department of Telecommunications' capital financing.

Source: Mahanagar Telephone Nigam Limited annual reports.

**Table A10.3: Sources and Applications of Funds**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>A. Sources</b>											
1. Operating Income	3,423	3,118	2,799	4,973	6,193	9,270	11,443	13,404	14,937	16,339	17,359
2. Depreciation	1,634	1,924	2,444	3,104	3,819	4,038	3,938	4,281	5,150	5,856	6,571
3. Nonoperating Income (net)	187	201	80	246	257	140	682	705	653	1,247	2,268
4. Subscriber Deposits	324	585	494	743	924	893	1,497	1,011	962	811	428
<b>Subtotal</b>	<b>5,568</b>	<b>5,828</b>	<b>5,817</b>	<b>9,066</b>	<b>11,193</b>	<b>14,341</b>	<b>17,560</b>	<b>19,401</b>	<b>21,702</b>	<b>24,253</b>	<b>26,626</b>
5. Telephone Bonds	3,000	5,000	4,350	8,740	9,430	17,944	9,510	3,592	10,828	0	0
6. Government Loan											
a. IBRD Project	162	292	104	22	6	6	0	0	0	0	0
b. ADB Project	0	0	0	0	0	0	0	0	0	0	0
c. Other	1,000	2,420	2,500	3,000	4,552	0	2,750	0	0	0	0
<b>Subtotal</b>	<b>1,162</b>	<b>2,712</b>	<b>2,604</b>	<b>3,022</b>	<b>4,558</b>	<b>6</b>	<b>2,750</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
7. Redemption of Investment in Government Companies	0	0	0	0	500	1,500	0	0	0	0	0
<b>Total Sources</b>	<b>9,730</b>	<b>13,540</b>	<b>12,771</b>	<b>20,828</b>	<b>25,681</b>	<b>33,791</b>	<b>29,820</b>	<b>22,993</b>	<b>32,530</b>	<b>24,253</b>	<b>26,626</b>
<b>B. Applications</b>											
1. Capital Expenditure	3,903	4,805	4,828	5,645	7,039	8,368	9,977	9,836	8,980	9,527	10,507
2. Investment in Government Companies	0	0	874	1,126	0	0	0	0	0	0	0
3. Debt Service	4,729	5,950	4,122	8,183	17,334	21,861	14,431	5,496	22,738	(2,977)	6,573
4. Tax	560	770	900	2,050	2,730	4,362	4,674	5,185	5,493	5,247	6,016
5. Dividend	840	840	360	360	480	600	600	1,200	1,200	1,827	1,890
6. Increase in Working Capital excluding Cash	35	1,059	1,095	1,040	101	(2,715)	164	979	(6,541)	1,065	1,361
<b>Total Applications</b>	<b>10,067</b>	<b>13,424</b>	<b>12,179</b>	<b>18,404</b>	<b>27,684</b>	<b>32,476</b>	<b>29,846</b>	<b>22,696</b>	<b>31,870</b>	<b>14,689</b>	<b>26,347</b>
<b>C. Cash Status</b>											
1. Cash Surplus for Year	(337)	116	592	2,424	(2,003)	1,315	(26)	297	660	9,564	279
2. Cash at Beginning of Year	683	346	462	1,054	3,478	1,475	2,790	2,764	3,061	3,721	13,285
3. Cash at End of Year	346	462	1,054	3,478	1,475	2,790	2,764	3,061	3,721	13,285	13,564
<b>D. Others</b>											
1. Operating Ratio (%)	66.7%	72.9%	78.6%	68.0%	66.3%	63.0%	61.2%	61.1%	62.9%	64.9%	65.5%
2. Rate of Return	29.1%	18.7%	10.0%	14.7%	15.7%	21.4%	27.1%	25.1%	24.7%	25.5%	24.4%
3. Debt Service Ratio (times)	5.0	3.6	1.1	2.4	0.8	0.4	5.6	4.3	0.9	n.a.	4.0
4. Accounts Receivable (months)	2.6	2.9	3.3	3.9	3.8	3.5	3.4	3.3	3.1	3.0	3.0
5. Debt/Equity Ratio (%)	162.4%	224.2%	263.0%	327.3%	368.5%	358.0%	314.5%	253.9%	215.0%	126.9%	61.4%

Source: Mahanagar Telephone Nigam Limited annual reports.

**VIDESH SANCHAR NIGAM LIMITED FINANCIAL STATEMENTS**

**Table A11.1: Income Statements**

(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995 <sup>a</sup>	1996 <sup>a</sup>	1997 <sup>a</sup>	1998 <sup>a</sup>	1999 <sup>a</sup>
<b>A. Operating Revenue</b>											
1. Telephone	2,078	2,705	3,273	4,924	6,703	7,131	33,889	42,329	49,318	57,527	62,077
2. Telex	287	225	193	163	122	195	778	646	576	453	359
3. Telegraph	46	39	36	41	27	14	92	78	68	62	50
4. Leased Channels	89	96	117	166	184	235	345	682	1,188	1,886	2,499
5. INTELSAT/INMARSAT	66	44	58	152	185	211	247	280	376	501	754
6. Other	59	62	78	542	168	180	250	327	580	822	1,442
<b>Total Operating Revenue</b>	<b>2,625</b>	<b>3,171</b>	<b>3,755</b>	<b>5,988</b>	<b>7,389</b>	<b>7,966</b>	<b>35,601</b>	<b>44,342</b>	<b>52,106</b>	<b>61,251</b>	<b>67,181</b>
<b>B. Operating Expenses</b>											
1. Personnel	108	122	135	159	179	244	291	462	566	804	790
2. Satellite Channels	88	108	74	206	428	600	632	817	1,155	1,401	1,667
3. Land Lines	1,166	1,623	1,872	2,870	3,467	3,121	29,306	35,231	41,260	45,720	47,845
4. Operation and Maintenance	52	55	59	88	148	212	269	303	470	418	547
5. Administration	64	41	51	74	164	2	(552)	356	305	1,067	453
6. Depreciation	249	205	240	395	694	407	495	558	576	655	803
<b>Total Operating Expenses</b>	<b>1,727</b>	<b>2,154</b>	<b>2,431</b>	<b>3,792</b>	<b>5,080</b>	<b>4,586</b>	<b>30,441</b>	<b>37,727</b>	<b>44,332</b>	<b>50,065</b>	<b>52,105</b>
<b>C. Operating Income</b>	<b>898</b>	<b>1,017</b>	<b>1,324</b>	<b>2,196</b>	<b>2,309</b>	<b>3,380</b>	<b>5,160</b>	<b>6,615</b>	<b>7,774</b>	<b>11,186</b>	<b>15,076</b>
<b>D. Interest on Bonds and Long-Term Loans</b>	76	55	0	13	22	196	427	67	44	12	1
<b>E. Nonoperating Income (Net)</b>	281	112	198	187	87	176	467	388	747	3,110	4,072
<b>F. Income before Tax</b>	1,113	1,074	1,522	2,370	2,374	3,360	5,210	6,936	8,477	14,284	19,147
<b>G. Tax</b>	470	495	740	1,330	1,250	1,600	2,220	2,850	3,220	4,310	6,382
<b>H. Dividend</b>	120	180	180	240	240	240	280	360	280	380	760
<b>I. Retained Profit</b>	523	399	602	800	884	1,520	2,710	3,726	4,977	9,594	12,005

INMARSAT = International Maritime Satellite Organization; INTELSAT = International Telecommunications Satellite Organization.

<sup>a</sup> Since fiscal year 1994/95, gross traffic revenue has been shown as income and charge for use of transmission facilities, instead of net traffic revenue.

Source: Videsh Sanchar Nigam Limited annual reports.

**Table A11.2: Balance Sheets**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>A. Assets</b>											
1. Gross Fixed Assets	1,461	1,537	1,864	2,579	4,063	5,122	8,204	10,566	12,345	15,216	17,698
2. Accumulated Depreciation	625	826	1,063	1,455	2,158	2,284	2,776	3,333	3,961	4,632	5,420
3. Net Fixed Assets	836	711	791	1,124	1,905	2,838	5,429	7,232	8,384	10,584	12,278
4. Capital Work in Progress	115	199	427	488	1,541	2,407	1,482	374	1,310	1,660	3,170
5. Investment in INTELSAT and INMARSAT	274	355	425	591	613	612	631	948	4,755	5,987	8,055
<b>Subtotal</b>	<b>1,225</b>	<b>1,265</b>	<b>1,643</b>	<b>2,203</b>	<b>4,059</b>	<b>5,857</b>	<b>7,542</b>	<b>8,554</b>	<b>14,449</b>	<b>18,231</b>	<b>23,503</b>
6. Current Assets											
a. Cash and Deposits	320	901	343	224	126	280	478	2,407	14,594	25,138	24,510
b. Accounts Receivable	2,664	1,346	1,984	2,577	4,616	5,141	9,587	13,440	15,299	16,817	20,107
c. Inventories	8	9	8	6	6	5	13	7	12	10	21
d. Other	1,996	2,740	2,332	3,340	4,544	10,035	4,057	7,508	7,599	6,612	14,114
<b>Subtotal</b>	<b>4,988</b>	<b>4,996</b>	<b>4,667</b>	<b>6,147</b>	<b>9,292</b>	<b>15,461</b>	<b>14,135</b>	<b>23,362</b>	<b>37,504</b>	<b>48,577</b>	<b>58,752</b>
<b>Total Assets</b>	<b>6,213</b>	<b>6,261</b>	<b>6,310</b>	<b>8,350</b>	<b>13,351</b>	<b>21,318</b>	<b>21,677</b>	<b>31,916</b>	<b>51,953</b>	<b>66,808</b>	<b>82,255</b>
<b>B. Equity and Liabilities</b>											
1. Share Capital - Paidup	600	600	600	800	800	800	800	800	922	950	950
2. Retained Earnings	1,856	2,245	2,852	3,456	4,366	5,899	8,647	12,377	28,857	40,853	53,256
<b>Subtotal</b>	<b>2,456</b>	<b>2,845</b>	<b>3,452</b>	<b>4,256</b>	<b>5,166</b>	<b>6,699</b>	<b>9,447</b>	<b>13,177</b>	<b>29,779</b>	<b>41,803</b>	<b>54,206</b>
3. Long-Term Loans											
a. Working Capital Loan	0	0	274	0	1,002	2,276	1,000	1,116	2,502	1,563	25
b. ADB Project	0	0	0	0	0	0	0	0	0	0	0
c. Other	516	0	0	0	0	1,501	1,250	0	0	0	0
<b>Subtotal</b>	<b>516</b>	<b>0</b>	<b>274</b>	<b>0</b>	<b>1,002</b>	<b>3,777</b>	<b>2,250</b>	<b>1,116</b>	<b>2,502</b>	<b>1,563</b>	<b>25</b>
4. Current Liabilities											
a. Accounts Payable	1,319	1,058	516	636	2,475	3,286	5,636	11,499	13,132	18,131	16,394
c. Income Tax Provision	1,682	2,177	1,888	3,218	4,468	7,316	4,334	6,124	6,260	4,931	10,870
d. Dividend Provision	240	180	180	240	240	240	280	0	280	380	760
<b>Subtotal</b>	<b>3,241</b>	<b>3,415</b>	<b>2,584</b>	<b>4,094</b>	<b>7,183</b>	<b>10,842</b>	<b>10,250</b>	<b>17,623</b>	<b>19,672</b>	<b>23,442</b>	<b>28,024</b>
<b>Total Equity and Liabilities</b>	<b>6,213</b>	<b>6,260</b>	<b>6,310</b>	<b>8,350</b>	<b>13,351</b>	<b>21,318</b>	<b>21,947</b>	<b>31,916</b>	<b>51,953</b>	<b>66,808</b>	<b>82,255</b>

ADB = Asian Development Bank; INMARSAT = International Maritime Satellite Organization; INTELSAT = International Telecommunications Satellite Organization.

Source: Videsh Sanchar Nigam Limited annual reports.

**Table A11.3: Sources and Applications of Funds**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>A. Sources</b>											
1. Operating Income	908	1,020	1,327	2,193	2,336	3,381	5,211	6,620	7,774	11,186	22,043
2. Depreciation	249	204	241	392	703	119	484	558	576	655	803
3. Nonoperating Income (net)	281	112	198	187	87	176	467	388	747	3,110	4,072
<b>Subtotal</b>	<b>1,438</b>	<b>1,336</b>	<b>1,766</b>	<b>2,772</b>	<b>3,126</b>	<b>3,676</b>	<b>6,162</b>	<b>7,566</b>	<b>9,097</b>	<b>14,951</b>	<b>26,918</b>
4. Loan	0	0	274	200	1,002	2,783	0	116	1,387	0	0
<b>Total Sources</b>	<b>1,438</b>	<b>1,336</b>	<b>2,040</b>	<b>2,972</b>	<b>4,128</b>	<b>6,459</b>	<b>6,162</b>	<b>7,682</b>	<b>10,484</b>	<b>14,951</b>	<b>26,918</b>
<b>B. Applications</b>											
1. Capital Expenditure	232	164	695	785	2,537	1,907	2,148	2,472	1,778	2,891	2,589
2. INTELSAT/INMARSAT	96	81	70	166	22	(1)	19	317	3,807	1,232	2,068
3. Debt Service											
a. Principal	811	517	0	274	0	21	1,528	1,250	0	940	1,537
b. Interest	76	55	0	13	22	196	427	67	44	12	1
4. Tax	470	495	740	1,330	1,250	1,600	2,220	2,850	3,220	4,310	6,382
5. Dividend	120	180	180	240	240	240	280	360	280	380	760
6. Increase in Working Capital excluding Cash	(367)	(156)	355	164	56	2,496	(460)	366	1,355	5,186	13,581
<b>Total Applications</b>	<b>1,438</b>	<b>1,336</b>	<b>2,040</b>	<b>2,972</b>	<b>4,127</b>	<b>6,459</b>	<b>6,162</b>	<b>7,682</b>	<b>10,484</b>	<b>14,951</b>	<b>26,918</b>
<b>C. Cash Status</b>											
1. Cash Surplus for Year	(16)	581	(558)	(119)	(98)	154	198	1,929	12,187	10,544	(628)
2. Cash at Beginning of Year	336	320	901	343	224	126	280	478	2,407	14,594	25,138
3. Cash at End of Year	320	901	343	224	126	280	478	2,407	14,594	25,138	24,510
<b>D. Others</b>											
1. Operating Ratio (%)	64.0%	68.0%	65.0%	63.0%	68.0%	60.0%	88.0%	94.0%	85.0%	82.0%	67.0%
2. Rate of Return - Historical (%)	42.0%	43.0%	57.0%	75.0%	60.0%	48.0%	59.0%	60.0%	54.0%	65.0%	127.0%
3. Debt Service Ratio (times)	16	20	1,529	183	109	18	13	105	206	15	18
4. Accounts Receivable (months)	12.0	5.1	6.3	5.2	7.5	7.7	3.4	3.6	3.5	3.3	3.6
5. Debt/Equity Ratio (%)	21.0%	0.0%	7.9%	0.0%	19.4%	56.4%	23.8%	8.5%	8.4%	3.7%	0.0%

INMARSAT - International Maritime Satellite Organization; INTELSAT = International Telecommunications Satellite Organization

Source: Videsh Sanchar Nigam Limited annual reports.

## HINDUSTAN CABLES LIMITED FINANCIAL STATEMENTS

**Table A12.1: Income Statements**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>A. Cable Production (ckm million)</b>	6.6	4.8	4.1	2.5	4.0	4.5	6.5	2.7	3.6	1.9
<b>B. Income from Operation</b>										
Sales	5,022	4,086	3,351	3,282	5,236	4,864	5,655	2,835	3,315	3,362
<b>C. Cost of Operation</b>										
1. Raw Materials	3,069	2,755	2,047	1,993	2,718	2,476	3,163	1,435	1,687	865
2. Fuel	47	44	38	42	53	59	99	70	84	90
3. Salaries and Wages	256	245	262	262	300	317	409	380	382	573
4. Overheads	1,006	465	519	699	1,423	1,366	1,124	860	1,372	2,436
Subtotal	4,378	3,509	2,866	2,996	4,494	4,218	4,795	2,745	3,525	3,964
5. Depreciation	165	171	137	154	160	160	172	127	218	322
<b>Total Cost of Operation</b>	<b>4,543</b>	<b>3,680</b>	<b>3,003</b>	<b>3,150</b>	<b>4,654</b>	<b>4,378</b>	<b>4,967</b>	<b>2,872</b>	<b>3,743</b>	<b>4,286</b>
<b>D. Operating Income</b>	479	406	348	132	582	486	688	(37)	(428)	(924)
<b>E. Interest Charges</b>	237	327	325	377	461	473	567	806	1,033	1,603
<b>F. Profit Before Tax</b>	242	79	23	(245)	121	13	121	(843)	(1,461)	(2,527)
<b>G. Tax</b>	42	13	0	0	0	0	0	0	0	0
<b>H. Dividend</b>	41	28	0	0	0	0	0	0	0	0
<b>I. Retained Profit</b>	159	38	23	(245)	121	13	121	(843)	(1,461)	(2,527)

ckm = conductor kilometers.

Source: Hindustan Cables Limited annual reports.

**Table A12.2: Balance Sheets**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>A. Assets</b>										
1. Gross Fixed Assets	1,847	1,964	2,089	2,414	2,460	2,672	3,190	4,488	4,874	4,907
2. Accumulated Depreciation	755	926	934	1,088	1,248	1,412	1,584	1,712	1,912	2,228
3. Net Fixed Assets	1,092	1,038	1,155	1,326	1,212	1,260	1,606	2,776	2,962	2,679
4. Capital Work in Progress	79	154	337	899	1,475	1,684	1,585	689	501	613
<b>Subtotal</b>	<b>1,171</b>	<b>1,192</b>	<b>1,492</b>	<b>2,225</b>	<b>2,687</b>	<b>2,944</b>	<b>3,191</b>	<b>3,465</b>	<b>3,463</b>	<b>3,292</b>
5. Current Assets										
a. Inventories	951	1,292	1,383	1,543	1,565	1,389	1,676	1,814	1,232	998
b. Accounts Receivable	1,647	1,851	1,430	1,434	2,364	3,009	3,563	2,940	1,964	1,912
c. Cash and Bank Balances	78	17	64	20	29	90	50	93	59	123
d. Advances	285	321	341	437	478	525	595	716	588	1,286
<b>Subtotal</b>	<b>2,961</b>	<b>3,481</b>	<b>3,218</b>	<b>3,434</b>	<b>4,436</b>	<b>5,013</b>	<b>5,884</b>	<b>5,563</b>	<b>3,843</b>	<b>4,319</b>
<b>Total Assets</b>	<b>4,132</b>	<b>4,673</b>	<b>4,710</b>	<b>5,659</b>	<b>7,123</b>	<b>7,957</b>	<b>9,075</b>	<b>9,028</b>	<b>7,306</b>	<b>7,611</b>
<b>B. Equity and Liabilities</b>										
1. Share Capital - Paid up	458	458	458	458	823	823	994	1,376	50	15
2. Retained Earnings	712	750	773	528	660	669	794	0	0	0
<b>Subtotal</b>	<b>1,170</b>	<b>1,208</b>	<b>1,231</b>	<b>986</b>	<b>1,483</b>	<b>1,492</b>	<b>1,788</b>	<b>1,376</b>	<b>50</b>	<b>15</b>
3. Long-Term Loans	1,890	2,356	2,548	2,827	4,003	4,611	5,156	5,868	5,634	4,931
4. Current Liabilities	1,072	1,109	931	1,846	1,637	1,854	2,131	1,784	1,622	2,665
<b>Total Equity and Liabilities</b>	<b>4,132</b>	<b>4,673</b>	<b>4,710</b>	<b>5,659</b>	<b>7,123</b>	<b>7,957</b>	<b>9,075</b>	<b>9,028</b>	<b>7,306</b>	<b>7,611</b>

Source: Hindustan Cables Limited annual reports.

**Table A12.3: Sources and Applications of Funds**  
(Year ending 31 March, Rs million)

Item	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>A. Sources</b>										
1. Operating Income	479	406	348	132	582	486	688	(37)	(428)	(924)
2. Depreciation	165	171	137	154	160	160	172	127	218	322
<b>Subtotal</b>	<b>644</b>	<b>577</b>	<b>485</b>	<b>286</b>	<b>742</b>	<b>646</b>	<b>860</b>	<b>90</b>	<b>(210)</b>	<b>(602)</b>
3. Increase in Share Capital	0	0	0	0	365	608	171	464	151	2,463
4. Loans	50	466	192	279	1,176	0	545	712	431	408
<b>Total Sources</b>	<b>694</b>	<b>1,043</b>	<b>677</b>	<b>565</b>	<b>2,283</b>	<b>1,254</b>	<b>1,576</b>	<b>1,266</b>	<b>372</b>	<b>2,269</b>
<b>B. Applications</b>										
1. Capital Expenditure	117	192	181	887	622	421	419	401	198	144
2. Debt Service										
a. Principal	0	0	0	0	0	0	0	0	956	1,415
b. Interest	237	327	325	377	461	473	567	806	1,033	1,603
3. Tax	42	13	0	0	(11)	0	0	0	0	0
4. Dividend	41	28	0	0	0	0	0	0	0	0
5. Increase in Working Capital excluding Cash	191	544	124	(655)	1,202	299	630	16	(1,781)	(957)
<b>Total Applications</b>	<b>628</b>	<b>1,104</b>	<b>630</b>	<b>609</b>	<b>2,274</b>	<b>1,193</b>	<b>1,616</b>	<b>1,223</b>	<b>406</b>	<b>2,205</b>
<b>C. Cash Status</b>										
1. Cash Surplus for Year	66	(61)	47	(44)	9	61	(40)	43	(34)	64
2. Cash at Beginning of Year	12	78	17	64	20	29	90	50	93	59
3. Cash at End of Year	78	17	64	20	29	90	50	93	59	123
<b>D. Others</b>										
1. Operating Ratio (%)	90.0	90.0	90.0	96.0	89.0	90.0	88.0	101.0	113.0	127.0
2. Return on Capital Employed (%)	16.0	12.0	10.0	4.5	14.5	11.0	13.0	-1.3	-14.4	-34.5
3. Debt/Equity Ratio (%)	161.5	195.0	207.0	286.7	269.9	309.0	288.4	426.5	1126.8	3287.3
4. Accounts Receivable (months)	3.9	5.4	5.1	5.2	5.4	7.4	7.5	12.4	7.1	6.8

Source: Hindustan Cables Limited annual reports.

## ECONOMIC AND FINANCIAL REEVALUATION OF THE INMARSAT C-TYPE COASTAL EARTH STATION AND ASSOCIATED COMPONENTS

### A. Economic Reevaluation

1. The economic reevaluation of the INMARSAT C-type coastal earth station includes the Mumbai international gateway telephone exchange and the Arvi-Mumbai digital microwave link components of the Telecommunications Project. The life of the components is assumed to be 13 years, after which the equipment will be decommissioned. As advised by Videsh Sanchar Nigam Limited, these components incur no incremental operating and maintenance costs. Economic benefits are based on revenues, and consumer surplus is not considered in the analysis. Financial benefits and costs are converted to economic benefits and costs using a standard conversion factor of 0.8 up to 1993, and 0.9 thereafter. Taxes and duties are excluded from the analysis. The analysis is carried out in 2000 prices.

**Table A13.1: Calculation of the Economic Internal Rate of Return**  
(Rs million in constant 2000 prices)

Year	Capital Costs	O&M Costs	Revenue	Net Economic Benefits
1989	0.0	0.0	0.0	0.0
1990	0.0	0.0	0.0	0.0
1991	71.39	0.0	0.0	(71.39)
1992	237.07	0.0	0.0	(237.07)
1993	18.40	0.0	188.43	170.03
1994	18.38	0.0	383.44	365.06
1995	0.0	0.0	445.28	445.28
1996	0.0	0.0	453.54	453.54
1997	0.0	0.0	492.53	492.53
1998	0.0	0.0	392.90	392.90
1999	0.0	0.0	214.39	214.39
2000	0.0	0.0	166.46	166.46
2001	0.0	0.0	133.17	133.17
2002	0.0	0.0	106.53	106.53
2003	0.0	0.0	85.23	85.23
2004	0.0	0.0	68.18	68.18
2005	0.0	0.0	54.55	54.55
			<b>EIRR =</b>	<b>80.8 %</b>

O&M = operation and maintenance.

### B. Financial Reevaluation

2. The analysis follows the economic reevaluation, except for the shadow pricing of costs and benefits.

**Table A13.2: Calculation of the Financial Internal Rate of Return**  
(Rs million in constant 2000 prices)

Year	Capital Costs	O&M Costs	Revenue	Net Financial Benefits
1989	0.0	0.0	0.0	0.0
1990	0.0	0.0	0.0	0.0
1991	134.21	0.0	0.0	(134.21)
1992	483.99	0.0	0.0	(483.99)
1993	39.10	0.0	235.54	196.44
1994	39.08	0.0	426.04	386.96
1995	0.0	0.0	494.76	494.76
1996	0.0	0.0	503.93	503.93
1997	0.0	0.0	547.26	547.26
1998	0.0	0.0	436.56	436.56
1999	0.0	0.0	238.21	238.21
2000	0.0	0.0	184.96	184.96
2001	0.0	0.0	147.97	147.97
2002	0.0	0.0	118.37	118.37
2003	0.0	0.0	94.70	94.70
2004	0.0	0.0	75.76	75.76
2005	0.0	0.0	60.61	60.61
			<b>FIRR =</b>	<b>50.2 %</b>

### ECONOMIC REEVALUATION OF PIJF CABLE CONVERSION AND ASSOCIATED COMPONENTS

1. The economic reevaluation of the polyethelene-insulated jelly-filled (PIJF) cable conversion component includes the concast copper rod, research and development equipment, and raw materials components. These associated components are integral to the production process of PIJF cable. The economic life of these components is assumed to be 20 years. The economic benefits are based on the international price of PIJF cable (currently about \$10.0 per conductor kilometer [ckm]) and full capacity utilization. PIJF cable is a traded good. Taxes and duties are excluded from the capital and other costs, and costs of nontradables are converted to economic values using a standard conversion factor of 0.8 up to 1993 and 0.9 thereafter. The analysis is carried out in 2000 prices.

#### Calculation of the Economic Internal Rate of Return (Rs million in constant 2000 prices)

Year	Output (million ckm)	Capital Cost	Labor Cost	Raw Material Cost	Utilities and Other Costs	Economic Benefits	Net Economic Benefits
1991	0.0	113.8	0.0	0.0	0.0	0.0	(113.8)
1992	0.0	136.9	0.0	0.0	0.0	0.0	(136.9)
1993	0.0	857.4	0.0	0.0	0.0	0.0	(857.4)
1994	0.0	524.9	0.0	0.0	0.0	0.0	(524.9)
1995	1.4	60.0	84.5	549.2	19.0	610.5	(102.2)
1996	0.0	60.9	0.0	0.0	0.0	0.0	(60.9)
1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2001	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2002	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2003	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2004	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2005	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2006	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2007	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2008	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2009	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
2010	3.1	0.0	187.2	1,216.1	42.0	1,351.9	(93.4)
Net Present Value (discounted at 12 %) =							(1,616.7)

ckm = conductor kilometers.