

**HUNDRED AND TWENTY-NINTH
REPORT
PUBLIC ACCOUNTS COMMITTEE
(1987-88)**

(EIGHTH LOK SABHA)

- (i) KHARAGPUR-MADRAS WIDEBAND MICRO-
WAVE SCHEME**
- (ii) CALCUTTA-NORTH BENGAL-ASSAM
WIDEBAND MICROWAVE SCHEME**
- (iii) NAGPUR-BANGALORE WIDEBAND MICRO-
WAVE SCHEME**

**MINISTRY OF COMMUNICATIONS
(DEPARTMENT OF TELECOMMUNICATIONS)**



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**LOK SABHA SECRETARIAT
NEW DELHI**

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PUBLIC ACCOUNTS COMMITTEE

(1987-88)

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*Ceased to be a member of the Committee consequent on his retirement from Rajya Sabha w.e.f. 1-4-88

INTRODUCTION

I, the Chairman of the Public Accounts Committee, as authorised by the Committee do present on their behalf this Hundred and Twenty Ninth Report on Paragraphs 19, 20 and 23 of the Report of Comptroller and Auditor General of India for the year 1985-86—Union Government (Posts and Telecommunications) relating to (i) Kharagpur-Madras wideband Microwave scheme, (ii) Calcutta-North Bengal-Assam wideband Microwave scheme, and (iii) Nagpur-Bangalore wideband microwave scheme.

2. The Report of the C&AG of India for the year 1985-86, Union Government (Posts and Telecommunications) was laid on the Table of the House on 8 May 1987.

3. In this report, the Committee have examined some of the issues relating to erection of microwave system of transmission on the three routes mentioned above.

4. The Committee have found that the microwave system of transmission had started in the developed countries in the late 1950's. However, in India, the Government decided to introduce a costlier and less reliable coaxial cable system in 1956. The Department introduced the microwave system on a small scale in 1960's, but continued to extend the coaxial network. The microwave system which is more economical and reliable was introduced as an alternative medium only in the early 1970's. The Committee have concluded that either the Department did not give adequate consideration to the relative merits of the two systems or it failed to keep track of the technological developments in this regard in the world. The Committee have emphasised that the decision to introduce a new technology of vital importance to the development of telecommunication and involving huge investment should have been taken after considering the relative merits of the other comparable technologies available in the world.

5. The microwave system of transmission has been provided mostly as an alternative medium in addition to the existing coaxial cable system. The Committee have found that provision of a duplicate transmission system involves huge investment. The Committee have expressed the opinion that provision of an alternative medium of transmission may be justified in advanced countries having larger traffic and resources but installation of an alternative medium in India lacks justification in view of the serious constraints of funds.

6. The Committee have found that the implementation of the three microwave schemes has been considerably delayed by 5/6 years resulting in cost escalations ranging from 57 to 80% of the original estimated cost.

besides loss of potential revenue. The Department of Telecommunications have tried to justify the delays by giving various reasons, such as non-receipt of supplies in time, delay in receipt of equipment, problems in acquisition of land, supply of power, time taken in clearance of sites by inter-Departmental Committee, etc. The Committee are not convinced of the reasons, They have observed that these are only a pointer to the poor and unimaginative planning in execution of the projects. The Committee have urged that monitoring mechanism in the Department should be tightened so as to ensure constant scrutiny of the progress of the projects/routes and take remedial measures whenever delay is anticipated so as to ensure timely completion of such projects.

7. The Committee have also observed that project estimates are worked out on the basis of present day costs and no provisions are made for escalations. In the opinion of the Committee, this is an area which needs probing. In this connection, the Committee have noted that average yearly increase in wholesale prices during the Fourth, Fifth and Sixth Five Year Plans has been 9, 6.3 and 9.3 per cent, respectively. In such a situation, it is totally unrealistic to presume that cost of a project will remain unchanged even after 4 or 5 years i.e., the scheduled date of completion of the project. The Committee have therefore emphasised that while formulating project estimates in future, the Department should carefully scrutinise their projects and while formulating feasibility reports, every care should be taken so that these are realistic and take into account the cost escalation due to normal rise in prices.

8. The Committee have found that the traffic and revenue projections in respect of the three shemes have been widely off the mark. The shortfall in revenue on the three projects as compared to the anticipations aggregated Rs. 87.05 crores up to 1985. The serious shortfall is mainly attributed to shortfalls in the traffic actually carried as compared to the traffic anticipated. The Committee have also found that the Department had serious problems in traffic forecasting. The revenue has been assessed on an *ad-hoc* basis. The Committee have observed that even though a long time has elapsed since the inter-city telecommunication network execution started, the Department has not yet been able to devise suitable yardstick for determining the cost and revenue for such projects, and consequently of *inter-se* priorities of different projects. The Committee have expressed the hope that installation of automatic traffic measuring equipment in trunk automatic exchanges and analysis of traffic there from will facilitate rational assessment of traffic; and the study undertaken by the Department to devise suitable means for traffic forecasting will result in more efficient traffic forecasting.

9. The Public Accounts Committee (1987-88) examined the Audit Paragraphs at their sitting held on 10 September 1987.

10. The Committee considered and finalised this Report at their sitting held on 12 April, 1988. The Minutes of the sitting form part II* of the Report.

11. For facility of reference and convenience, the observations and recommendations of the Committee have been printed in thick type in the body of the Report and have also been reproduced in a consolidated form in Appendix-III to the Report.

12. The Committee would like to express their thanks to the officers of the Ministry of Communication (Department of Telecommunications) for the cooperation extended by them in giving information to the Committee.

13. The Committee also place on record their appreciation of the assistance rendered to them in the matter by the Office of the Comptroller and Auditor General of India.

NEW DELHI;
April 20, 1988

Chaitra 31, 1910(S)

AMAL DATTA,
Chairman,
Public Accounts Committee

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CHAPTER I

REPORT

Introductory

1.1 Effective means of communication are the basic need for socio-economic development and telecommunication provides the most cost-effective means of communication. Choice of an appropriate telecommunication system and its efficient functioning are, therefore, of vital importance for socio-economic development of a nation.

1.2 The Committee have examined three* paragraphs appearing in the Report of the Comptroller and Auditor General of India 1985-86 (Posts & Telecommunications) dealing with erection of microwave systems of transmission on the following routes :

- (i) Kharagpur-Madras wideband microwave scheme;
- (ii) Calcutta-North Bengal-Assam wideband microwave scheme; and
- (iii) Nagpur-Bangalore wideband microwave scheme.

The three paragraphs from the Report of the Comptroller and Auditor General are reproduced in *Appendix I*. This Report is based on examination of these paragraphs.

Choice of telecommunication technologies

1.3 At the time of Independence, India inherited a rudimentary telecommunication system. On 1-4-1948, the country had a total of 321 telephone exchanges with 82,000 working connections inter-connected by a total of 426 long distance (inter-city) speech channels working entirely on open-wire lines. The open-wire/channel system was subject to disturbances due to storms, weather, vandalism etc. and the system was inadequate to meet the growth of traffic. In 1956, the Department decided to go in for underground coaxial cables. In 1960s, the Department decided to inter-connect the country's metropolitan cities, i.e., Delhi, Bombay, Calcutta and Madras by means of underground coaxial cable system.

1.4. Towards the early 1970s, it was decided to go in for the microwave system. In support of this decision coming immediately in the wake of installation of coaxial cables the Department has stated that though the coaxial cable system provided large block of circuits of good quality, the

*Paragraphs 19, 20 and 23 of the Report of the C & AG (P & T) for 1985-86.

reliability was not upto the desired level. Its cables get damaged by lightning, heavy rains and floods and in road construction/repair works.

1.5. Although the microwave system had started in the developed countries sometimes in the late 1950s., in India a decision was taken by Government in early 1970s that there should be an alternative means for the four major nodes, i.e., Delhi-Bombay, Bombay-Madras, Calcutta-Madras and Calcutta-Delhi in addition to the existing coaxial cable systems. Presently, six main routes, namely, Delhi-Bombay, Bombay-Madras, Calcutta-Madras, Delhi-Calcutta, Delhi-Madras and Bombay-Calcutta have all been completed through the microwave network in addition to the existing coaxial cable systems. For future, it is proposed to have a duplicated transmission system on the digital microwave on basically the existing routes and optical fibre cables to provide additional channels. The optical cables will basically substitute the coaxial cables. The existing coaxial cables wherever they are in good condition will be used for wayside stations; which would ultimately be taken away after about 20 years. The life of the microwave system is about 20 years. However, the life of the optical fibres is expected to be 40-50 years.

1.6 Seeking clarification on the need for introduction of microwave system, the Committee pointed out to the representatives of the Ministry of Communications during evidence that the countries abroad operating coaxial cable systems must be facing problem like lightning, rain, flood, road construction, etc. and enquired how these countries were coping with the system. Explaining the position existing in USA, which is having one of the largest coaxial cable system, the Secretary (Telecommunications) submitted that USA went along the fields and they bought the right of way on the land. In many cases that country has put concrete ducts buried at 6' to 8' which were carrying cables such as from New York to San Francisco. According to the Secretary (Telecommunications), Government of India probably could not afford to bear such huge investment on ducting. Asked specifically if any calculations were made about the cost of ducting the coaxial cables, the Secretary (Telecommunications) submitted that formal calculations were not really made but there was an overall assessment only which indicated that expenditure on ducting would run into hundreds of crores. He, however, admitted that recently the Department had started constructing ducts. He added that keeping in view the fact that most of the coaxial cable routes needed expansion and additional circuits at a huge cost which too were not fully reliable, the Department decided to go in for microwave instead of going in for another coaxial cable system.

1.7. According to the Secretary (Telecommunications), the Department started using microwave in the 1960s on a small scale but it was towards early 1970s when the Department noticed that most of the coaxial

cables provided large block of circuits and of good quality but the reliability was not adequate and that the Department instead of going in for another coaxial cable system started going in for microwave. The Secretary (Telecommunications) admitted that microwave has certain advantages in terms of cost and reliability but it has a little disadvantage also.

1.8 The microwave systems of transmission have been provided as an alternative medium in addition to the existing coaxial cable systems. According to the Secretary (Telecommunications), the object of having an additional back-up system is that when there is additional traffic on the coaxial system the same can be taken by the microwave routes and when there is interruption in one system the whole channel can be switched over to the other.

1.9 The Committee on Telecommunications (Sarin Committee) in their report submitted to Government in 1981 observed that the costs of microwave and UHF radio systems are in general about 50 percent or less of costs of coaxial systems and of the two, microwave systems have less faults. In view of the distinct advantages of the microwave system, the Sarin Committee recommended as follows :

- (a) all new routes should normally be set up using radio systems. Exceptions would be schemes under physical execution provision of equipment to increase capacity of existing coaxial cables and in special cases, e.g. for routes near borders for security reasons;
- (b) a higher degree of uninterrupted communication should be provided between main TAXEs and from these to the the Primary TAXEs. Efforts should be made to exploit the higher reliability/availability of microwave systems. Where necessary, an additional standby bearer on microwave systems on the direct and/or alternative routes should be adequate and cost effective. The erection of new microwave route is to be preferred to the installation of a new coaxial route; and
- (c) new radio or coaxial expansion should normally use digital equipments.

1.10 The Committee find that although the microwave system had started in the development countries in late 1950s, the Government of India decided in 1956 to introduce coaxial cables system and in 1960 to interconnect the metropolitan cities by the coaxial system when other developed countries had already started using the more economic and reliable microwave system of telecommunication. It appears that either the Department did not give

*Extract of paragraph 2.11.5 of the Report is at Apperdx II

adequate consideration to the relative merits of the two systems or it failed to keep track of the technological developments in this regard in the world. The Department started using microwave in the 1960 on a small scale and, therefore, it can be assumed that atleast by then the Department had obtained practical knowledge of the relative merits of the two systems. It is astonishing that even then the Department continued to extend the costlier and less reliable coaxial network and decided to introduce the more economic and reliable microwave system as an alternative medium in early 1970s only. The Committee cannot but express unhappiness on the faulty planning in this matter by the Department. It hardly needs to be emphasised that the decision to introduce a new technology of vital importance to the development of tele-communication and involving huge investment should have been taken after considering relative merits of the other comparable technology available. At this stage the Committee can only hope that the Department will keep abreast of the latest technological developments in the field of tele-communication and in future will introduce any new technology only after detailed consideration of the relative merits of the available alternative technologies so that our limited resources are put to best use.

1.11 The Committee note that the microwave systems of transmission have mostly been provided as an alternative medium in addition to the existing coaxial cable systems. The object of having an alternative backup system is that when there is additional traffic on the coaxial system the same can be taken by the microwave routes and when there is interruption in one system the whole channel can be switched over to the other. Provision of a duplicate transmission system involves huge investment. The Committee are of the view that provision of an alternative medium of transmission may be justified in advanced countries having large traffic and resources but installation of a duplicate medium in India lacks justification in view of serious constraint of funds. The coaxial system of transmission, though older and more expensive has not completely outlived its utility and is still being used on a large scale even in advanced countries. Moreover, these had just been installed when the decision to have microwave system as an additional back up channel was taken. The Department has recently started improving its reliability by ducting the underground cables. The committee are of the opinion that it was preferable to have improved upon the functioning of the existing coaxial system than to have gone in for an additional medium at that stage. The Committee hope that in future the Department will be more circumspect in taking decision of this nature and in view of the limited resources should spend whatever resources are available on establishing new routes connecting additional cities, towns and villages.

1.12 In view of the advantages of economy and higher reliability of the microwave system, in comparison with coaxial cable system, the Sarin Committee have recommended that barring certain exceptional situations, "all new routes should normally be set up using radio system" and "the erection of a new microwave route is to be preferred to the installation of a new coaxial route." The Committee desire that on account of distinct advantages of the microwave system, the recommendations of the Sarin Committee alongwith any further developments in technology in this regard should be kept in view while setting up all new routes.

CHAPTER II

EXECUTION OF THE WIDE BAND MICROWAVE SCHEMES

Delays in completion

2.1 None of the three wide band microwave schemes discussed in the Report* of the Comptroller and Auditor General of India (Posts and Telecommunication), 1985-86 has been completed by the target dates of completion. The progress of execution of these schemes as compared to the target dates of their completion is detailed below:

(i) *Khagrapur-Madras wideband microwave scheme.*

While the EFC memo approved in August 1978 had been drawn on the assumption of the scheme being commissioned by 1982, in the project estimates, commissioning was expected within 3 years after receipt of all equipment and other materials. The main route was commissioned placed under proviing in by stages section-wise between July 1983 and December 1985. Out of the three spur routes, one route (Kharagpur-Midnapore) was commissioned in June 1984, while the other 2 rutes had not been commissioned till January, 1986.

(ii) *Calcutta-North Bengal-Assam wideband microwave scheme.*

This scheme envisaged installation of a wideband microwave system on the main route from Calcutta to Tinsukhia, narrow band microwave system on 6 of the 7 spur routes and a wide band system on the 7th spur route (Indo-Bangladesh link). The scheme was expected to be completed by 1980-81. Only 2 sections of the main route were commissioned before the target date. One section was commissioned after a delay of 3 years and the fourth section from Jorhat to Tinsukhia had not been commissioned even by June 1985. Of the 7 spur routes, only one route had been commissioned in time, one was commissioned after a delay of 3 years and 9 months, 3 routes had not been commissioned even by June 1985 and 2 routes had been given up.

(iii) *Nagpur-Bangalore wideband microwave scheme.*

The EFC memorandum approved in October 1978 expected the scheme to be completed by 1981-82. The project estimate sanctioned in March 1980 was, however, not specific about the date of completion but indicated that the scheme was expected

*Paragraphs 19, 20 and 23 of C & AG Report (P & T) for 1985-86.

to be commissioned within about 4 years from the date of receipt of all equipments and stores. However, the phasing of expenditure on the project was shown to spread over upto the end of 1982-83.

The scheme had not been completed even by May 1986. The position (May 1986) regarding commissioning/placing under proving-in of the various sections of the main route from Bangalore to Nagpur was as under:—

| Name of Section | Commissioned/placed under proving-in |
|------------------------------------|---------------------------------------|
| (1) | (2) |
| (i) Bangalore—Guntakal | March 1983 |
| (ii) Guntakal—Raichur | } March 1984 |
| (iii) Raichur—Hyderabad | |
| (iv) Hyderabad—Nizamabad | } Not Commissioned |
| (v) Nizamabad—Chandrapur | |
| (vi) Chandrapur—Nagpur | Placed under proving-in in May, 1986. |

One of the two spur routes (Secunderabad-Gulbarga) which was subsequently re-engineered as Mamadgi-Gulbarga route was commissioned in August 1985. The other spur route (Nagpur-Chindwara) had not been commissioned even upto May 1986.

Loss of Revenue

2.2 Non-commissioning and delays in commissioning of various sections of the three schemes have resulted in loss of potential revenue as indicated below:

- (i) Kharagpur-Madras route (2 spur routes) Rs. 52.43 lakhs per annum since 1982-83
- (ii) Calcutta-North Bengal-Assam route. Rs. 6.66 crores upto March 1985.
- (iii) Nagpur-Bangalore route Rs. 7.86 crores upto March 1986.

Reasons for delays

2.3 The reasons that emerge from the Audit Report and evidence of the representatives of the Ministry of Communications (Department of Telecommunications) for delays in execution of the three schemes are broadly as follows :

- (i) Delay in procurement of equipment.

- (ii) non-supply of various equipments by Indian Telephone Industries (ITI).
- (iii) failure or problems in acquisition of land especially in case of forest land, which is governed by a special Act, namely, Forest Act 1980 and as such requires to be cleared by a special authority of the Govt. of India (Deptt. of Forest).
- (iv) delays in construction of buildings and other civil works,
- (v) delay in receipt/clearance of imported equipment,
- (vi) diversion of equipment meant for one scheme to another,
- (vii) re-engineering of certain sections of the scheme,
- (viii) delay in supply of equipment by indigenous sources etc.

2.4 During evidence, the Secretary, Telecommunications submitted that due to coming up of Forest Act in 1980, acquisition of forest land had become extremely difficult and time consuming. Even if the land was given on lease by the State Government, permission for felling of trees would not normally be given by the Central Government. He, however, expressed the view that the procedure of land acquisition has since been streamlined but meanwhile the schemes have been badly delayed on this account. He also mentioned that the matter of selection of land for Stations, the Department required clearance from an Inter-Departmental Committee (SACFA), where Civil Aviation ensured before giving clearance that the proposed structure would not cause obstruction for air services. After acquisition of land normally it took 10 to 12 months to construct building on it. In case of hilly land it might take more time to construct buildings over it. One of the main reasons for delays in execution of the projects has been delays on the part of ITI in supply of equipment. In this connection, the representative of ITI stated that even in cases of relatively simple micro-wave systems the ITI had to undertake R&D work involving considerable time and also soliciting and obtaining assistance from foreign sources to perfect the technology developed by it. Moreover, even when foreign samples of components had been satisfactory, bulk supply contained defective components. All these meant delay of 7/8 years between placing of orders and clearance for starting production. According to ITI it is the price which had to be paid for switching over to indigenous production from imported supplies.

Cost overruns.

2.5 The Department have not been able to complete and commission any of these projects in time resulting in huge escalation of costs, as will be seen from the facts indicated below:

| Name of the Scheme | Project estimate with the year of sanction | Projected year of completion | Anticipated on completion (as on June 1987) | Over-run Time | Cost in Percentage |
|--|--|------------------------------|---|---------------|--------------------|
| (1) | (2) | (3) | (4) | (5) | (6) |
| | (Rs. in lakhs) | | (Rs. in lakhs) | | |
| (i) Kharagpur—Madras wide band microwave scheme* | 1740.50 March, 1980 | 1982 | 2729.59 | 5 years | 57% |
| (*of the 3 spur routes, H10 are yet to be commissioned) | | | | | |
| (ii) Calcutta—North Bengal—Assam wideband microwave scheme/* | 1946.68 October, 1976 | 1980-81 | 3370.94 | 6 years | 73% |
| (iii) Nagpur—Bangalore wide-band microwave scheme* | 1344.57 March, 1980 | 1982-83 | 2414.22 (Upto July (1987) | 5 years | 80% |
| (*Projects till incomplete as on July 1987) | | | | | |

2.6 During evidence, the Secretary (Telecommunications) agreed that cost escalation over sanctioned costs were inevitable in case of delayed completion of the projects. He stated that a very deliberate decision has been taken by the Government that all project estimates should be worked out on the basis of present day costs and no provision should be made for escalation although it was inevitable in an economy in which there was rapid inflation

2.7 The Committee find that the implementation of the three microwave schemes has been considerably delayed and the schemes expected to be completed in 1982, 1980-81 and 1982-83 were still incomplete as on 31 July 1987. The Committee note that even after 5/6 years from the projected year of completion, the schemes remained incomplete and involved cost escalations ranging from 57% to 80% of the original estimated cost. Non-commissioning and delays in commissioning of the various sections of the schemes have also resulted in loss of potential revenue-

2.8 The Department of Telecommunications have tried to justify the delays by giving various reasons, such as non-receipt of supplies in time, delay in receipt of equipment, indigenous and imported, problems in acquisition of land especially forest; time taken in clearance of sites by inter-Departmental Committee, i.e., the Standing Advisory Committee on Frequency Allocation (SACFA); delay in construction of buildings; delays in supply of power at the repeater stations; and such other factors. The Committee are of the view that reasons for these delays are not completely beyond control and in fact are only a pointer to the poor and unimaginative planning in execution of the projects. Delays in project implementation have grave financial and economic implications. While the Committee regret the delays in completing the projects, they urge upon the Government to ensure that there is no further slippage in completion of these projects. They also urge that monitoring mechanism in the Department should be tightened so as to ensure constant scrutiny of the progress of the projects, routes and take remedial measures whenever delay is anticipated so as to ensure timely completion of such projects.

2.9 Forest Act which came into force in 1980 is stated to have hindered the progress of acquisition of forest land. All the projects were mooted long before 1980. Had advance action been taken for acquisition of land, it could have been acquired to synchronise with the progress of the projects. Thus, inaction, lack of initiative and lack of proper planning were the principal reasons for problems and delays in acquisition of land. The procedure, practices and organisation involved in project construction, planning and implementation needs strengthening. The Committee need hardly emphasise the necessity of ensuring coordination between the various agencies of the Government.

2.10 The Committee are of the opinion that even the delay in clearance of selected land for centre stations by the Inter-Departmental Committee could have been avoided or atleast minimised if the selection of the site was done by the Telecommunications Department in consultation with the Department of Civil Aviation or Defence Department from whom they might need clearance in the Committee. The Committee would urge the government to consider the matter in depth in consultation with the concerned Ministries and Departments and to evolve a suitable mechanism so that technical suitability of land to be acquired is adjudged in advance and delay in acquisition of lands are avoided. The Committee would like to be apprised of further developments in this regard.

2.11 During evidence the Secretary informed the Committee that project estimates are worked out on the basis of present-day costs and no provisions are made for escalations. In the opinion of the Committee this is an area which needs probing. In this connection the Committee note from the information supplied by the Minister of Finance in the Lok Sabha on 11-3-1988

that average yearly increase in wholesale prices during the Fourth, Fifth and Sixth Five Year Plans has been 9, 6.3 and 9.3 per cent respectively. In such a situation it is totally unrealistic to presume that cost of a project will remain unchanged even after 4 or 5 years, i.e. the scheduled date of completion of the project. The Committee, therefore, emphasise that while formulating project estimates in future, the Department should carefully scrutinise their projects and while formulating feasibility reports, every care should be taken so that these are realistic and take into account the cost escalation due to normal rise in prices.

CHAPTER III

PROJECTIONS OF TRAFFIC AND REVENUE

3.1 Even in those sections of the three schemes which have been completed and commissioned, the STD and manual traffic actually handled has been far below the traffic anticipated to be handled on these sections. The actual revenue from these completed and commissioned sections has, therefore, been far less than the anticipations of revenue. The cumulative shortfall of revenue upto 1985 in respect of the completed and commissioned sections of these schemes amounted to Rs. 8704.80 lakhs as detailed below :

| Scheme | Year(s) to which anticipated/ actual revenue pertains | Anticipated revenue | Actual revenue | Shortfall |
|---|--|------------------------|-------------------|----------------|
| (1) | (2) | (3) | (4) | (5) |
| (Rs. in Lakhs) | | | | |
| (i) Kharagpur—Madras : | | | | |
| (a) Main route | 1984 & 1985 | 5320.31 | 2030.74 | 3289.57 |
| (b) Kharagpur—Midnapur UHF route | 1985 | 15.15 | 4.88 | 10.27 |
| (ii) Calcutta—North Bengal— | | | | |
| Assam | 1981-82 to 1984-85 1984- | 5732.92 | 1743.20 | 3980.72 |
| (iii) Nagpur—Bangalore | and 1985 | 2007.60 | 583.36 | 1424.24 |
| TOTAL | | 13066.98 | 4362.18 | 8704.80 |

The projections of traffic and revenue in respect of all the three schemes were thus far from realistic.

3.2 Admitting that traffic forecasts have generally never been achieved, the Telecommunications Secretary submitted during evidence that the Department had a serious problem in forecasting traffic for these schemes because it had little experience in forecasting STD traffic. Based on whatever experience the Department had about forecasting STD traffic, the Department evolved a formula for planning introduction of STD, which assu-

med growth of traffic at the rate of 15% per annum. According to the Secretary, Telecommunications this growth rate could not materialise because (i) the growth rate of telephones could not be maintained at the anticipated level, (ii) in many routes STD could not be introduced because the transmission systems got delayed, and (iii) trunk automatic exchanges could not be installed. He, however, assured the Committee that the Department had undertaken study of the means that could be applied for forecasting traffic more efficiency. The Department have also been installing automatic traffic measuring equipment in trunk automatic exchanges and were trying to analyse from where the traffic was originating and what was its destination.

Profitability of the projects

3.3 The project estimates in respect of the three wide band microwave projects envisaged profits at the following rates :

| Project | Estimated cost (Rs. in lakhs) | Anticipated Profit per annum (Rs. in lakhs) | Percentage of return on capital |
|---------------------------------------|----------------------------------|--|---------------------------------|
| (1) | (2) | (3) | (4) |
| Kharagpur—Madras | 1740.50 | 1078.12 | 61.94 |
| Calcutta—North Bengal—Assam | 1946.68 | 654.81 | 33.63 |
| Nagpur—Bangalore | 1344.57 | 222.47 | 16.54 |

3.4 The Secretary (Telecommunications) stated during evidence that a paper prepared on the final cost incurred and traffic actually carried on each of the three projects indicated that the return in the case of one was zero, in the other case it was 17 per cent and in the third case it was 9 per cent after paying interest at the rate of 7-8 per cent per annum. He also stated that it was difficult to calculate actual traffic carried by microwave, especially in the case of the two projects where the microwave was to be used as a stand-by medium only. Keeping this fact in view only 50% credit of the traffic had been given to the microwave project. Explaining further the difficulties in calculating traffic on a particular route it was stated that sometimes the particular traffic might not come between two particular cities but might come between other cities. According to the Secretary (Telecommunications) in telecommunication one has to look at the overall net work and traffic and it is difficult to pointedly say that this transmission system is profitable and the other one is not.

3.5 The Committee find that the shortfall in revenue on the three projects as compared to the anticipations aggregated Rs. 87.05 crores upto 1985. Actual percentages of return on the three projects were zero, 17 and 9 against the anticipated percentage of 61.94, 33.63 and 16.54. The serious shortfall in the revenue and profits are mainly due to shortfalls in the traffic actually carried as compared to the traffic anticipated. This is indicative of the fact the the projections of traffic and revenue in respect of all the three schemes were far from realistic. In view of the wide variations between the expected and actual results, the Committee are constrained to conclude that the three projects have been got approved on the basis of over optimistic projections.

3.6 The traffic and revenue projections in respect of all the three schemes have been widely off the mark. According to the Department, they had serious problems in traffic forecasting. The revenue has also been assessed on an *ad-hoc* basis as is evident from the fact that 50% credit of the traffic has been given to the microwave project without any rationale. The Committee hope that installation of automatic traffic measuring equipment in trunk automatic exchanges and analysis of traffic therefrom will facilitate rational assessment of traffic. They also hope that the study undertaken by the Department to devise suitable means for traffic forecasting will result in more efficient traffic forecasting. It is imperative that suitable means are devised for correct traffic and revenue forecasting to assess the profitability of projects. Faulty forecasting may mean that profitable and socially and economically more desirable projects may be left out in favour of those which are less profitable and otherwise less desirable to implement. The Committee feel strongly that even though a long time has elapsed since intercity telecommunication network execution has started, the Department has not yet been able to devise suitable yardstick for determining the cost and revenue for such projects and consequently of the *inter se* priorities of different projects.

NEW DELHI;
April 20, 1988
 Chaitra 31, 1910 (S)

AMAL DATTA
 Chairman,
 Public Accounts Committee.

APPENDIX I

(See Para 1-2 of the Report)

Paragraphs 19, 20 & 23 of the Report of Comptroller & Auditor General of India (P & T), 1985-86

Para 19. Kharagpur-Madras wide band microwave scheme

The department sanctioned a project estimate for the above scheme in March 1980 for Rs. 1740.50 lakhs in order (i) to provide an effective alternate medium to the existing coaxial medium between Madras and Calcutta (ii) to meet the additional demands due to existing/proposed trunk automatic exchanges at Madras, Vijayawada, Visakhapatnam and Calcutta (iii) to provide reliable circuits for STD services for various stations on east coast and (iv) to provide channels for transmission of TV programmes among various cities enroute.

The scheme envisaged the following :

- (i) A(1+1) 1800 channel wide band microwave system on Kharagpur-Madras route (1505 kms)
- (ii) 2 GHz 300 channel microwave systems on Visakhapatnam-Koraput (128 kms.) and Cuttack-Dhenkanal (40 kms.) routes
- (iii) An ultra high frequency (UHF) system on Kharagpur-Midnapur route (10 kms.).

While the EFC memo approved in August 1978 had been drawn on the assumption of the scheme being commissioned by 1982, in the project estimate, commissioning was expected within 3 years after the receipt of all equipment and other materials. The scheme was expected to earn an annual profit of Rs. 1078.12 lakhs.

The main route was commissioned/placed under proving-in by stages section wise between July 1983 and December 1985. Out of the three spur routes, one route, viz. Kharagpur-Midnapore was commissioned in June 1984, while the other 2 routes had not been commissioned till January 1986. The total expenditure incurred on the project upto the end of March 1986 was Rs. 2261.93 lakhs. 29.95 per cent in excess of the sanctioned cost.

A review of the project in audit during September-October 1985 and January-February 1986 revealed the following points :

1. Non-achievement of targets in respect of STD traffic

STD traffic actually flowing in 1984 and 1985 was very much less than the anticipations made by the department as indicated below (Table 19.1) :

TABLE 19.1

| Sl. No. | Route | STD traffic anticipated for 1984 (In Erlongs) | STD traffic actually handled (In Erlongs) | |
|---------|------------------------------------|---|---|------|
| | | | 1984 | 1985 |
| 1. | Calcutta—Bhubaneswar | 74 | 17.7 | 17.4 |
| 2. | Cuttack—Calcutta | 114.9 | 24.5 | 24.4 |
| 3. | Calcutta—Madras | 212 | 71.3 | 63.8 |
| 4. | Calcutta—Hyderabad | 33 | 16.9 | 18.9 |
| 5. | Visakhapatnam—Vijayawada | 171 | 50.4 | 52.6 |
| 6. | Vijayawada—Madras | 185 | 97.0 | 77.8 |
| 7. | Madras—Hyderabad | 171.6 | 56.3 | 69.5 |

On account of the steep fall in anticipated STD traffic, the revenue on STD which would accrue to the department based on the higher traffic during 1984 and 1985 was of the order of Rs. 2030.74 lakhs per annum against Rs. 5320.31 lakhs anticipated in the project estimate. There was, thus, a short fall of Rs. 3289.57 lakhs per annum in spite of increase in tariff rates. Thus, the projections made by the department were far from realistic and could not be realised.

2. Spur routes

(a) Kharagpur-Midnapore UHF route

UHF system connecting Kharagpur with Midnapore was made over to Maintenance Division in November 1984 (after completion of proving-in which commenced in June 1984). The trunk call traffic handled by this system in 1985 was less than 50 per cent of the traffic anticipated to be handled in 1982 though according to the forecast made by the department, there should have been annual growth of 15 per cent doubling in 5 years. The traffic anticipated and the traffic actually handled was as under (Table 19.2) :—

TABLE 19.2

| Route | Anticipated traffic in 1982 | Traffic handled in 1985 |
|------------------------------|-----------------------------|-------------------------|
| Calcutta—Midnapur | 520 calls per day | 162 calls per day |
| Kharagpur—Midnapur | 492 calls per day | 226 calls per day |

Consequently, as against the anticipated annual revenue of Rs. 15.15 lakhs, the revenue accruing on traffic actually handled was Rs. 4.88 lakhs only. The projections made by the department were, thus, very much on the higher side.

(b) Cuttack-Dhenkanal narrow band route

The narrow band microwave system connecting Cuttack and Dhenkanal with a repeater at Haldibari (an existing repeater on Cuttack-Sambalpur route) has not been commissioned even by January 1986. The main reason for this was the non-completion of building at Dhenkanal, the construction of which was started in January 1983. Another reason was that the microwave tower at Haldibari repeater station collapsed in May 1984 due to cyclone and till November 1985 the department had not finalised the design to strengthen the foundation with the result that the tower at this place has not been re-erected. Due to non-commissioning of this route, the department has been losing a potential annual revenue of Rs. 21.96 lakhs since 1982-83. Also the radio equipment received at a cost of Rs. 43.05 lakhs for this route in 1983 remained unutilised.

(c) Visakhapatnam-Bobbili-Koraput narrow band route

This narrow band spur route between Visakhapatnam and Koraput had not been commissioned completely. The section between Visakhapatnam and Bobbili had been acceptance-tested in May 1985 and proving-in orders for the system were awaited (October 1985). In the section between Bobbili and Koraput (falling in Eastern Project Circle area), even installation of the radio equipments had not been done due to non-completion of buildings at Koraput, Boddavalasa and Addumanda (December 1985). Besides, the under mentioned points also contributed to the delayed completion/non-completion of work on this spur route.

—Non placement of orders for multiplexing equipment for the route till April 1983 and that for Bobbili station till September 1983.

—Non-placement of orders for wave guide till July 1984.

—Non-acquisition of land at 2 places (Addumanda and Boddavalasa) till October 1983.

—Non-receipt of tower materials for Boddavalasa station.

—Action not taken till December 1985 to procure coaxial cable and accessories required at Koraput.

—Orders not placed till December 1985 for supply of battery and power plant for Koraput station.

Due to delay in commissioning of this spur route, the department has been losing a potential annual revenue of Rs. 30.47 lakhs since 1982-83.

3. As mentioned earlier, the project along with its spur routes was targeted for commissioning by 1982. Delay in commissioning the project was mainly attributable to (a) delay in construction of buildings and (b) delay in procurement of apparatus and plant.

(i) *Buildings*

47 microwave buildings were initially planned to be constructed at different stations by 1979-80. The completion date was, however, shifted to 1981-82 while sanctioning the project estimate in March 1980. As against the normal period of 4/6 months required for construction of these buildings, the actual time taken for completion of these buildings was far in excess as detailed below (Table 19-3).

TABLE 19-3

| No. of buildings | Time taken |
|------------------|---------------------------------|
| 9 | Between 12 months and 18 months |
| 5 | Between 18 months and 24 months |
| 8 | Over 24 months |
| 4 | Not completed (January 1986). |

(ii) *Apparatus and plant*

Orders for supply of multiplexing (MUX) equipment, hyper group translation (HGT) equipment, pressurisation equipment etc. were placed on the Indian Telephone Industries (ITI) in November 1979 with delivery date as June 1980. The ITI had not commenced supply even by February 1983 where-upon the General Manager, Projects, Madras urged the P&T Directorate for taking necessary action for procurement of MUX and HGT equipments on priority basis as installation of radio equipments had been completed in 2 stations and the medium could not be utilised without MUX and HGT equipments. He had also urged for the advisability of early import of HGT equipment being examined in July 1983 was supply by the ITI was very uncertain since production clearance had not been given. Supply of MUX equipment by the ITI commenced in March 1984. The department in the meantime, having cancelled in December 1983 all pending orders with the ITI for supply of HGT equipment, had to import ultimately HGT equipment which was received in January 1986. In the absence of HGT equipment, the microwave system remained grossly under utilised as only a few circuits working on coaxial medium had been transferred to the new medium.

Other topics of interest

1. *Deviation in specification for providing end link at Visakhapatnam*

The project estimate provided only for a coaxial end-link at Visakhapatnam considering the rocky terrain as unsuitable for laying and maintenance of coaxial cable, the department decided in June 1980 to explore the possibility of providing a rearward 11 GHz microwave end link and a fresh survey was conducted in April 1981. A detailed estimate for Rs. 74.25 lakhs for providing the microwave end link was sanctioned in June 1984. The order for supply of 11 GHz equipment was, however, placed earlier November 1983 on a foreign firm and supply received in May 1984. Meanwhile, anticipating delay in procuring the 11 GHz equipment, a decision was taken in June 1983 to install a 6 GHz end-link as a temporary measure utilising the spare equipments supplied for this project and Bangalore-Nagpur microwave scheme. For this purpose, 2 Nos. of 6 GHz antennae were diverted from Bikaner in January 1984 and the temporary end-link was commissioned in March-April 1984. On commissioning of the 11 GHz end link in April 1985, the two nos. of 6 GHz antennae diverted from Bikaner became surplus and instructions for their diversion elsewhere were being awaited (October 1985). The Coaxial cable received at Visakhapatnam (11.5 kms.) was diverted to Ernakulam in April 1982 incurring an expenditure of Rs. 1.02 lakhs on transportation.

2. *Stocking of cement*

About 60 tonnes of cement valued at Rs. 0.48 lakh was lying at Midnapore from May 1983 (after construction of UHF building at that place). This fact also came to the notice of the General Manager, Telecom Projects, Calcutta in May 1984 who was of the opinion that the cement might not be in useable condition. Though action was initiated in June 1984 for diversion of this quantity of cement to other works, nothing concrete had taken shape so far (January 1986).

3. *Loss on account of cables burnt during transit*

A consignment of 5 drum of coaxial cables despatched by HCL Roopnainpur by Railway Wagon in October 1981 and received at Visakhapatnam was found to be completely charred due to fire accident in transit. A joint survey conducted by the Railway and P&T authorities in January 1982 confirmed this position. A claim for Rs. 2.72 lakhs was preferred by the department (DET Microwave Project Visakhapatnam) on the Railway administration in February 1982. The claim was, however, rejected by the Railway administration in September 1983 on the plea that the fire was caused due to improper loading by the sender. Chances of recovering the cost of burnt cables are remote. The department had been thinking (June 1985) of disposing of the burnt cable which was expected to fetch about Rs. 0.41 lakh.

4. *Extra payment to contractor at higher rates for quantities in excess of deviation limits.*

For quantities of work executed beyond the deviation limit of 50 percent, the contractor is allowed to claim extra rates for the increased quantity. This deviation limit is not applicable to foundation work. The department, however, paid a sum of Rs. 0.70 lakh for work executed in excess of the deviation limits in respect of tower foundation work at 3 places (Nallore, Guntur, Abbineniguntapalem).

5. *Unnecessary blocking up of capital*

Orders were placed on HCL in August 1982 for supply of 12.5 kms. coaxial cable required for Madras station. However, as the existing tower and building at Harbour site were utilised for hoisting the antenna, wave guide and installation of radio and multiplexing equipments, the coaxial cable received could not be utilised thereby resulting in blocking up of capital to the tune of Rs. 14.90 lakhs. The cables were diverted to another station (Srikakulam) in October 1985 involving extra expenditure on transportation. Incidentally, it is pointed out that there is no provision in this project estimate for laying coaxial cable at Srikakulam.

6. *Non-incorporation of expenditure incurred by civil divisions on construction of buildings and tower foundations.*

The construction of buildings and tower foundations at certain places had been entrusted to the civil wing of the department, the project organisation itself executing this work in other places. It was, however, noticed that the expenditure incurred by the civil divisions for construction of buildings and tower foundations was not being included/included partially in the total expenditure under 'Buildings'/Towers with the result that the overall expenditure as available in the records of the project organisation did not reveal the correct position as illustrated below (Table 19.4) :

TABLE 19.4

| Name of Project Circle | Component | Expenditure incurred (Rs. in lakhs) By Project Organisation | By Civil Div. | Total | (Rs. in lakhs) | |
|----------------------------------|-----------|---|---------------|--------|--|-----------------------------|
| | | | | | Total expenditure as incorporated in the Accounts of project | Remarks |
| Southern Project Circle Madras. | Buildings | 60.12 | 33.83 | 93.95 | 61.48 | Expenditure |
| -do- | Towers | 234.42 | 25.26 | 259.68 | 244.27 | Upto August 1985 |
| Eastern Project Circle Calcutta. | Buildings | 15.40 | 46.67 | 62.07 | 26.21 | Expenditure upto Dec., 1985 |
| -do- | Towers | 61.94 | 42.39 | 104.33 | 70.10 | |

Summing up :

- Kharagpur-Madras wide band microwave scheme targeted for commissioning by 1982 was only partially commissioned by December 1985.
- There was a shortfall of Rs. 3289.57 lakhs per annum in anticipated revenue due to actual STD traffic being far less than anticipations in the main route. Similarly, in respect of one spur route commissioned, the shortfall in revenue was Rs. 10.27 lakhs per annum.
- The department has been losing potential revenue of Rs. 52.43 lakhs per annum since 1982-83 due to non-commissioning of 2 spur routes.
- Microwave system was grossly under utilised due to delay in procurement of HGT equipment which were received in January 1986 only.
- Due to installation of a rearward 11 GHz microwave end-link at Visakhapatnam for which there was no provision in the project estimate, the department incurred extra expenditure of Rs. 1.02 lakhs on transportation of coaxial cable from Visakhapatnam to another place.

The matter was reported to the Ministry in June 1986 and despite 4 reminders issued in August 1986, September 1986, October 1986 and November 1986 the comments were still awaited (December 1986).

*Para 20 Calcutta-North Bengal-Assam wideband microwave scheme**1. Introductory*

Posts and Telegraphs Department approved in July 1975 a scheme for installation of a wideband microwave system from Calcutta to Tinsukia covering North Bengal and Assam at a cost of Rs. 1772.98 lakhs as the existing 7 GHz 300 Channel narrow band system on Asansol-Katihar-Siliguri-Coochbehar-Shillong-Tezpur-Jorhat-Tinsukia route was found to be inadequate to meet the demands of traffic for 1981 and also because certain routes had become important which were not covered by the existing system. The scheme envisaged installation of a wide band microwave system on the main route from Calcutta to Tinsukia, narrow band microwave systems on 6 of the 7 spur routes and a wide band system on the 7th spur route (Indo-Bangladesh link).

Project estimate for the work was sanctioned in October 1976 at a cost of Rs. 1946.68 lakhs. The scheme was expected to be completed by 1980-81 and fetch a profit of Rs. 654.81 lakhs per annum.

Review of the records relating to the project conducted by Audit during May-June 1985 revealed the following :—

1. Cost over-run

The actual expenditure incurred upto March 1986 on the project was Rs. 2976.16 lakhs which worked out to 152.88 per cent of the sanctioned.

estimated cost. Revised project estimate has not yet been prepared and approved.

2. Non-achievement of physical targets and loss of potential revenue

The project was anticipated to be completed and commissioned during 1980-81. The actual position was as under (Table 20) :

TABLE 20

| Section | Date of commissioning | Extent of delay | Reasons attributed for delay |
|---|--|---------------------|---|
| A. MAIN ROUTE | | | |
| (i) Calcutta-Katihar Siliguri-Coochbehar | August 1979 | — | |
| (ii) Coochbehar-Gauhati | February 1980 | — | |
| (iii) Gauhati-Jorhat | March 1984 | 3 years | Non-supply of radio/multiplexing equipments by I.T.I. |
| (iv) Jorhat-Tinsukia | Not commissioned (June 1985) | | 1. Non-completion of civil works at all places involved. 2. Non-supply of radio equipments by I.T.I. |
| B. SPUR ROUTES | | | |
| (a) Indo-Bangladesh link | March 1981 | — | |
| (b) Indo-Bhutan link | December 1984 | 3 years 9 months | Non-supply of equipment by I.T.I. |
| (c) Krishna Nagar-Berhampur Dhulian | Scheme dropped | | |
| (d) Siliguri-Jalpaiguri/Darjeeling | Not completed (June 1985) | | Non-supply of radio and MUX equipment by I.T.I. |
| (e) Dhulian-Malda | Scheme dropped | | 1. Non-completion of civil works |
| (f) Gauhati-Bongaigaon | Re-engineered as Rangjuly-Bongaigaon not commissioned (June 1985) | | 2. Non-supply of radio/MUX equipments by I.T.I. 3. Scheme re-engineered. 4. Local leads not available with N.E. circle. |
| (g) Calcutta-Ranaghat | Re-engineered as Ranaghat-Krishnanagar (November 1984) not commissioned (May 1985) | | 1. Equipment received for this scheme diverted. 2. Fresh orders for supply of equipment not placed till September 1984. |

Thus, only 2 sections of the main route were commissioned before the target date (1980-81). One section was commissioned after a delay of 3 years and the fourth section from Jorhat to Tinsukia had not been commissioned even by June 1985. Of the 7 spur routes, only one route had been commissioned in time, one was commissioned after a delay of 3 years and 9 months, 3 routes had not been commissioned even by June 1985 and 2 routes

had been given up. Due to non-commissioning/delay in commissioning of the various routes, the department had lost potential revenue of Rs 6.66 crores upto March 1985.

3. Shortfall in revenue due to anticipations not materialising

Even in the sections completed and commissioned, it was noticed that the Manual and STD traffic actually handled by the system during the years 1982, 1983 and 1984 was far below the traffic anticipated to be handled in 1980. The annual revenue accruing to the department, taking into account the traffic actually flowing was Rs. 435.80 lakhs as against the anticipated revenue of Rs. 1430.98 lakhs resulting in a shortfall of Rs. 995.18 lakhs per annum. The cumulative effect of this shortfall of revenue for the period from 1981-82 to 1984-85 was Rs. 3980.72 lakhs.

4. Irregular and delayed supply of multiplexing (MUX) equipment and radio equipment by ITI.

Orders for supply of MUX equipments and testing instruments for the main route from Calcutta to Shillong were placed on Indian Telephone Industries (ITI) in September 1977 with the date of delivery as December 1978. The supply by ITI was irregular with the result that though the imported radio equipments for the wideband route had been received and installed in Calcutta-Coochbehar section by August 1979 and in Coochbehar-Shillong route by January 1980, the system could not be commissioned for want of MUX equipment and the department had to divert MUX equipment from elsewhere for observing the system during the proving-in period for providing skeleton service. The supply from ITI was stated to have been completed in November 1983. Thus, even though the section from Calcutta to Gauhati had been commissioned by February 1980, the utilisation of circuits as envisaged in the scheme could not be achieved till November 1983. Similarly, in respect of another order placed on ITI in March 1979 for supply of 6 GHz radio equipment for Jorhat-Tinsukia route, the supply had not been completed by ITI even by June 1985. The buildings constructed and towers erected in this section could not be utilised. Though ITI is under the same administrative Ministry, there was no coordination between the department and ITI in regard to manufacture and supply of the equipment.

5. Other topics

(a) Idling of equipment due to non-provision of local leads at Nowgong

The Gauhati-Nowgong-Jorhat section of the main route was placed under proving-in with effect from 31st March 1984 and made over to Maintenance wing in August 1984. The local cables connecting the Microwave station with the trunk exchange at Nowgong had not been laid (June 1985) with the result that the traffic expected to originate from and terminate at Nowgong on the wide band microwave system could not be put through

and the radio equipments and the multiplexing equipment installed for this purpose (value : Rs. 25.68 lakhs approximately) remained idle from August 1984. This had resulted in potential loss of revenue of Rs. 1.23 crores upto July 1985 and also deprived the public of the benefits of a reliable telecommunication medium.

(g) Non-utilisation of equipments due to re-engineering of spur routes

Anticipating delay in supply of radio equipments for Krishnanagar-Dhulian spur route and in order to provide for S.T.D. circuits at Malda and Berhampur, the department decided in March 1981 to install DI-300 equipment at these two stations on the main wide band route. Consequently, the narrow band route Krishnanagar-Berhampur-Dhulian was given up as the traffic did not justify narrow band route. As a result of this, the radio equipment/multiplexing equipment (Cost : Rs. 77.53 lakhs) for this route received in 1983-84 and 1984-85 were lying unutilised. The department stated (June 1985) that these were being diverted to some other schemes.

Another spur route Gauhati-Bongaigaon with 4 hops in between was re-engineered as Rangjuly-Gopalpara-Bongaigaon system with 2 hops. As however, ITI had already supplied all the equipments worth Rs. 100.44 lakhs for the originally planned 2 GHz Gauhati-Bongaigaon route, (consisting of 4 hops), the equipments for 2 hops (value : Rs. 50 lakhs approximately) had been rendered surplus due to re-engineering and awaited diversion elsewhere.

(c) Non-recovery of liquidated damages

Orders for supply of 6 GHz wide band radio microwave equipment for Calcutta-Assam route were placed on a foreign firm in November 1976 for a total value of Rs. 447.11 lakhs (905.36 lakh Japanese Yens plus 42.94 lakhs). The stipulated date of delivery was 30th September 1977 which was later on amended as 22nd November 1977. The supply of the equipment was completed in September 1978 resulting in delay of 9 months. As per the accepted tender. (A/T), the purchaser was entitled to claim liquidated damages amounting to one percent of the net total (f.o.b.) Japan price for each month of delay subject to a maximum of 5 percent of the total f.o.b. price which worked out to Rs. 20.20 lakhs. The information on levy of liquidated damages or otherwise was awaited (November 1986).

Summing Up

- Calcutta-North Bengal-Assam wide microwave scheme targeted for commissioning in 1980-81 had not been commissioned completely, one section of the main route and 3 spur routes, out of a total of 7, remained uncommissioned (June 1985) resulting in loss of potential revenue of Rs. 6.66 crores up to end of March 1985.
- Due to actual traffic handled by the system being far less than the projection made by the department, there was a shortfall in revenue of Rs. 3980.72 lakhs during 1981-82 to 1984-85.

- Due to irregular and delayed supply of equipments by IIT, the microwave system could not be utilised to the extent envisaged in the project estimate.
- Non-provision of local cables at Nowgong had resulted in potential loss of revenue of Rs. 1.23 crores.
- Re-engineering of 2 spur routes had resulted in equipments worth Rs. 127.53 lakhs becoming surplus to requirements.

The matter was reported to the department in June 1986 and despite 3 reminders issued in August, October and November 1986 the comments of the department were still awaited (December 1986).

Para 23. Nagpur-Bangalore wide band microwave scheme

Introductory

The department sanctioned a project estimate in March 1980 for Rs. 1344.57 lakhs in respect of the above-mentioned scheme which envisaged installation of

- (i) A (1+1) 1800 channel wide band microwave system on Nagpur-Secunderabad-Bangalore route (1129 kms.)
- (ii) A 2 GHz 300 channel narrow band microwave system on Nagpur-Chindwara route (100 kms.)
- (iii) A 7 GHz channel narrow band microwave system on Secunderabad-Gulbarga route (205 kms.).

The main objective of the scheme was to provide an alternate medium to the existing coaxial medium on the main route (Nagpur-Bangalore). The project estimate envisaged an annual profit of Rs. 222.47 lakhs representing a return of 16.54 per cent on the capital. While the EFC memo approved in October 1978 expected the scheme to be completed by 1981-82, the project estimate was not specific about the date of completion and indicated that the scheme was expected to be commissioned within about 4 years from the date of receipt of all equipments and stores. However, the phasing of expenditure on the project was shown to spread over up to the end of 1982-83.

The project had not been completed even by May 1986. The position (May 1986) regarding commissioning/placing under proving-in of the various sections of the main route from Bangalore to Nagpur was as under :—

| Name of Section | Commissioned/placed under proving-in |
|------------------------------------|--------------------------------------|
| (i) Bangalore-Guntakal | March 1983 |
| (ii) Guntakal-Raichur | |
| (iii) Raichur-Hyderabad | March 1984 |
| (iv) Hyderabad-Nizamabad | Not commissioned |
| (v) Nizamabad-Chandrapur | |
| (vi) Chandrapur-Nagpur | Placed under proving-in in May 1986. |

One of the two spur routes viz. Secunderabad-Gulbarga which was subsequently re-engineered as Mamadgi-Gulbarga route was commissioned in August 1985. The other spur route, Nagpur-Chindwara has not been commissioned even upto May 1986. The total expenditure incurred on the project upto the end of March 1986 was Rs. 1774.44 lakhs against the sanctioned cost of Rs. 1344.57 lakhs.

A review of the records relating to the project conducted by Audit during September 1985, October 1985 and May 1986 revealed the following :

1. *Delay in execution of work in Nagpur-Hyderabad section (Western Project Circle)*

While the work of the main route between Bangalore and Hyderabad executed by Southern Project Circle had been completed and the system commissioned in March 1984, the portion between Hyderabad and Nagpur executed by Western Project Circle had not been commissioned even by May 1986 except for one section (Nagpur-Chandrapur) which had been placed under proving-in during May 1986. The main reasons for slow execution of work in this section were: (i) delay on the part of the Civil Wing of the department in construction of buildings for two microwave terminal stations at Chandrapur and Nizamabad which were completed only in January 1986 and February 1986 respectively, (ii) delay in supply of tower materials by the firm on whom orders were placed in March 1980 for supply of towers for eleven stations on Nagpur-Hyderabad section. The supply of towers by the firm was erratic and in respect of five stations the supply was completed in December 1985 even though the supply was to have been completed in March 1981. The department extended the delivery date upto 30th September 1985 without levy of liquidated damages. This delay would further be accentuated due to collapse of a tower while under erection at Mukutben in April 1986 which required dismantlement and re-erection after obtaining supplies in respect of damaged tower materials.

Due to this delay, the radio equipment imported in 1980 (value : 33.43 crores Japanese Yens equivalent to Rs. 154.50 lakhs) had remained idle. The department had meanwhile lost the benefit of the warranty clause in the agreement as the warranty would expire 12 months after the date of 'Taking Over Certificate' of the equipment or 36 months from the date of shipment of last material whichever would be earlier. The equipments having been supplied by the firm during September 1980 and October 1980, the warranty clause could not be effective after October 1983.

2. *Loss of potential revenue due to delay/non-commissioning of the various sections of the main route and the spur routes*

As mentioned earlier, the microwave system had been commissioned between Bangalore and Hyderabad in phases during March 1983 to March 1984 and one of the spur routes had been commissioned in August 1985.

The other spur route and the portion of the main route between Hyderabad and Chandrapur (the section Nagpur-Chandrapur had been placed under proving-in in May 1986) had not been commissioned so far. Due to delay/non-commissioning of the various sections of the main route and the spur routes there had been a loss of potential revenue to the department to the tune of Rs. 786.03 lakhs till March 1986.

3. *Non-achievement of targets in respect of STD and manual trunk traffic.*

In the sections commissioned, the STD traffic and the manual trunk traffic actually flowing in 1984 and 1985 vis-a-vis the anticipations made by the department are indicated below (Table 23) :—

TABLE 23

(a) STD traffic

| Sl. No. | Route | STD traffic anticipated for 1982 (In Erlongs) | STD traffic actually handled (In Erlongs) | |
|---------|-------------------------------|---|---|------|
| | | | 1984 | 1985 |
| 1. | Hyderabad-Guntakal | 58.8 | 8.2 | 10.1 |
| 2. | Hyderabad-Bangalore | 153.4 | 35.5 | 40.8 |

(b) Manual Trunk Traffic

| Sl. No. | Route | Trunk traffic anticipated for 1982 (No. of calls) | Trunk traffic actually handled (No. of calls) | |
|---------|-------------------------------|---|---|------|
| | | | 1984 | 1985 |
| 1. | Hyderabad-Guntakal | 680 | 128 | 114 |
| 2. | Hyderabad-Raichur | 822 | 50 | 163 |
| 3. | Hyderabad Bangalore | 439 | 634 | 731 |
| 4. | Guntakal-Raichur | 476 | 86 | 77 |
| 5. | Raichur-Bangalore | 422 | 262 | 300 |

It may be seen from the above that excepting for the manual traffic in the route Hyderabad-Bangalore which registered an increase over the earlier anticipations, the traffic (both STD and manual) actually flowing on other routes was far below the anticipations of the department. The revenue on STD and trunk calls which would accrue to the department based on the traffic in the years 1984 and 1985 was Rs. 291.68 lakhs per annum as

against Rs. 1003.80 lakhs anticipated. There was, thus, a shortfall of revenue amounting to Rs. 712.12 lakhs per annum in spite of increase in tariff rates. The cumulative effect of this shortfall was Rs. 1424.24 lakhs for two years.

4. *Equipment rendered surplus due to re-engineering of spur route*

Initially, the 7 GHz narrow band spur route between Hyderabad and Gulbarga was planned as a six-hop system with five repeaters between the two terminals at Hyderabad and Gulbarga and orders for radio equipments, wave guides, etc. were placed accordingly in February 1981. The first four repeaters proposed for this route were already functioning on existing wide band route between Hyderabad and Pune. In September 1984, the project organisation proposed to the Directorate for re-engineering of this route as Honnabad-Gulbarga narrow band route by introducing a DI-300 equipment at Honnabad on the existing wide band microwave system as this would result in passing over four repeaters and saving radio equipment wave guides, antenna, etc. The proposal was slightly altered (October 1984) to provide DI-300 equipment at another station, Mamadgi instead of Honnabad and re-engineer the route as Mamadgi-Gulbarga narrow band route. The DI-300 equipment was diverted from the Western Maintenance Region and installed at Mamadgi by June 1985 and the re-engineered route was commissioned in August 1985, the approval of the Directorate for this re-engineering was given in June 1985/August 1985. By this re-engineering of the route, radio equipments for two terminals and two repeaters besides six antennae and wave guide (total estimated cost Rs. 34.91 lakhs) were rendered surplus. Radio equipment for 2 terminals and 2 repeaters were stated to have been utilised on another route which was commissioned in March 1986.

5. *Non-acquisition of land at Khelod*

The case regarding acquisition of 0.67 hectare of forest land at Khelod, one of the repeater stations on Nagpur-Chindwara spur route, was initiated by the project organisation in February 1980. After protracted correspondence, the Government of Madhya Pradesh decided (September 1983) not to allot the forest land to the P&T Department and wanted the department to carry out the project outside the area covered by the forest department. The department took up the matter again with the State Government at higher level, but nothing tangible had been achieved so far (May 1986). In the meantime, the department worked on the idea of locating an alternate site (August 1984) and re-survey of the route was conducted in September 1984. This was, however, not pursued further. Due to non-acquisition of land for Khelod repeater station, the 7 GHz spur route between Nagpur and Chindwara could not be commissioned so far (May 1986). Investment of Rs. 103.17 lakhs on towers, radio equipments, MUX equipments etc. as at the end of 1985-86 remained unproductive.

6. *Non-commissioning of centralised supervisory control system*

Provision of centralised supervisory systems in the main central stations at Bangalore and Nagpur was expected to make it possible to have complete centralised supervision of the system through which the status of the whole system would be available at any moment in the form of print-out as well as CRT displays. The cost of the system was Rs. 7.99 lakhs (210.98 lakh Japanese Yens) per station. These equipments had been received along with the other equipments in 1980. In June 1984, the Director, Microwave Project, Bangalore apprised the P&T Directorate that it had not been possible to commission the centralised supervisory equipment as the company had not supplied all the required drawings for testing this equipment and suggested for deputation of the company's engineers for commissioning of the equipment. The centralised supervisory system could not be commissioned till July 1985. Thus, the centralised supervisory system procured at a cost of 421.96 lakh Japanese Yens equivalent to Rs. 15.98 lakhs (excluding customs duty etc.) had been lying idle since 1980. The centralised supervisory equipment at Bangalore is stated to have been commissioned later in September 1986.

7. *Avoidable extra expenditure likely to be incurred on procurement of high power terminations*

Equipments for repair centres were included in the orders placed in September 1979 for import of radio equipment from a foreign firm. The equipment for repair centres was supplied by the firm along with the rest of the equipments in September 1980 and October 1980. In September 1984, the department wrote to the supplier about the non-supply of high power terminations for the repair centres without which it was difficult to make effective use of the repair centres. It was observed that the department had not brought to the notice of the firm the non-receipt of the high power terminations when it addressed the firm in May 1983 regarding short receipt of equipments. The firm expressed its inability to supply free of cost the above high power terminations as the warranty period of 36 months had expired in October 1983. Thus, the department was rendered liable to incur extra expenditure (not quantified) in procuring this equipment which was avoidable.

8. *Damage to batteries due to improper handling*

350 nos. of 400 AH batteries were obtained by the project organisation from Circle Telecommunication Stores (CTS), New Delhi in December 1984 and brought to Hyderabad by road transport. On opening the packing cases at Hyderabad, 159 batteries valued at Rs. 2.54 lakhs were found to be damaged beyond use. The CTS, New Delhi contended that the batteries were delivered to project staff at New Delhi in good condition and that the damages would have been caused during transit or loading/unloading.

As the batteries were out of warranty and guarantee period, the supplier firm quoted Rs. 0.26 lakh as the cost of the parts to replace the damaged ones. Thus, due to improper handling, the department was liable to incur an extra expenditure of Rs. 0.26 lakh to bring the batteries into working condition. The damaged batteries had not been repaired even by June 1986.

9. Non-adjustment of advance paid to firm for supply of tower materials

Orders were placed (March 1980) on a firm for supply of tower materials for fourteen stations (11 heavy weight towers and 3 light weight towers). The supply of the light weight towers was subsequently cancelled in July 1984 at the behest of the firm. However, the advance of Rs. 3.00 lakhs paid to the firm in June 1980 for these 3 towers had not been adjusted even upto May 1986.

10. Inordinate delay in the construction of microwave terminal buildings at Chandrapur and Nizamabad

The work for construction of microwave terminal building at Chandrapur was awarded to firm 'A' by the Civil Wing of the department in May 1982 after inviting tenders. The work was to be completed within 9 months (i.e. February 1983) but was actually completed in January 1986 (after 3 years) due to (i) unsuitability of the site for which the department had to spend Rs. 1.45 lakh (approximately) to bring it to a suitable condition, (ii) change in the opinion of the microwave authorities regarding horizontal extension of building and (iii) slow progress of work by the contractor even from the beginning.

The department did not contemplate any action against the contractor till August 1985 for the slow progress of work. It was then decided to issue a show cause notice under the relevant clauses of the contract. The notice was however not served on the contractor who was allowed to complete the work in January 1986. The reasons for the slow progress on the part of the contractor were attributed to his illness, financial crisis and lack of management. The question of levy of penalty on the contractor for the inordinate delay was stated to be under consideration (May 1986).

Similarly, in respect of another station (Nizamabad) for which work was awarded in December 1982 for completion in 10 months, the building was actually completed in February 1986.

As earlier stated, this inordinate delay in the construction of the above two buildings had also been a contributory factor in non-commissioning of the system between Nagpur and Hyderabad.

Summing up

—The microwave system which was expected to be completed by 1982-83 had not been commissioned in full even by May 1986.

- Due to delay in commissioning and non-commissioning of various sections there had been a loss of potential revenue to the department to the tune of Rs. 786·03 lakhs till March 1986.
- The STD and manual trunk traffic handled during 1984 and 1985 in the sections commissioned was far less than those anticipated for 1982. On account of this, there had been a shortfall of revenue to the tune of Rs. 712·12 lakhs per annum. The cumulative effect of this shortfall was Rs. 1424·24 lakhs in 2 years.
- Re-engineering of one of the spur routes had resulted in equipments worth Rs. 34·91 lakhs being rendered surplus.
- Due to non-commissioning of the spur route investment of Rs. 103·17 lakhs on towers, radio equipments, MUX equipments, etc. had remained unproductive.
- Due to non-commissioning of the centralised supervisory control system, equipments worth Rs. 15·98 lakhs, received in 1980, had been lying idle.
- An advance of Rs. 3·00 lakhs paid to a firm in 1980 for supply of three, light weight towers, the supply of which was cancelled subsequently in 1984 at the behest of the firm, had not been adjusted so far (May 1986).
- There had been inordinate delay in the construction of two microwave terminal buildings by the Civil Wing of the department which was one of the main factors responsible for non-commissioning of the system till May 1986.

The matter was reported to the department in July 1986 and despite 3 reminders in September, October and November 1986, the comments of the department were still awaited (December 1986).

APPENDIX II

(See Para 1.9 of the Report)

*Extract from Reports of Committee on Telecommunications
(Sarin Committee), 1981*

2.11.5 The cost of microwave and UHF radio systems (according to recent P&T data) are in general about 50%* or less of costs of coaxial systems for the bulk of the proposed routes taking into account the length and capacity requirements. The performance of radio and coaxial systems installed in the last eight years indicates that both are highly reliable with low fault liability. However, of the two, microwave systems have less faults. Further, since microwave systems have a standby radio bearer with automatic switch over, a system about 1,000 km long has on an average one interruption in a year lasting a few hours, the number and duration of interruptions on coaxial routes is 3 times** higher. Such interruptions on radio systems can be reduced further by providing an additional standby radio bearer at an additional cost of 10 to 20%. This is because the faults are rarely in the common facilities e.g., tower, antenna and batteries. UHF radio systems are used generally over distance of less than 100 km—their performance and reliability is fully adequate for these applications.

*Cost refer to the medium and line equipment only excluding multiplexing and test instruments. Data are based on indigenous cost of coaxial cable/equipment and current import costs of microwave radio equipment.

**Data relate to 1980-81 and are based on a note dated 3-9-1981 from 'ML' Section of P & T Directorate.

APPENDIX III

Statement of Observations/Recommendations

| S. No. (s) | Para No. (s) | Ministry/Department Concerned | Observations/Recommendations |
|------------|--------------|---|--|
| 1 | 2 | 3 | 4 |
| 1. | 1-10 | Ministry of Communications (Deptt. of Telecommunications) | <p>The Committee find that although the microwave system had started in the developed countries in late 1950's, the Government of India decided in 1956 to introduce coaxial cables system and in 1960 to interconnect the metropolitan cities by the coaxial system when other developed countries had already started using the more economic and reliable microwave system of telecommunication. It appears that either the Department did not give adequate consideration to the relative merits of the two systems or it failed to keep track of the technological developments in this regard in the world. The Department started using microwave in the 1960's on a small scale and, therefore, it can be assumed that atleast by then the Department had obtained practical knowledge of the relative merits of the two systems. It is astonishing that even then the Department continued to extend the costlier and less reliable coaxial network and decided to introduce the more economic and reliable microwave system as an alternative medium in early 1970's only. The Committee cannot but express unhappiness on the faulty planning in this matter by the Department. It hardly needs to be em-</p> |

phasised that the decision to introduce a new technology of vital importance to the development of tele-communication and involving huge investment should have been taken after considering relative merits of the other comparable technology available. At this stage the Committee can only hope that the Department will keep abreast of the latest technological developments in the field of tele-communication and in future will introduce any new technology only after detailed consideration of the relative merits of the available alternative technologies so that our limited resources are put to best use.

2. 1.11 Ministry of Communications (Department of Telecommunications)

The Committee note that the microwave systems of transmission have mostly been provided as an alternative medium in addition to the existing coaxial cable systems. The object of having an alternative back-up system is that when there is additional traffic on the coaxial system the same can be taken by the microwave routes and when there is interruption in one system the whole channel can be switched over to the other. Provision of a duplicate transmission system involves huge investment. The Committee are of the view that provision of an alternative medium of transmission may be justified in advanced countries having large traffic and resources but installation of a duplicate medium in India lacks justification in view of serious constraints of funds. The coaxial system of transmission, though older and more expensive has not completely outlived its utility and is still being used on a large scale even in advanced countries. Moreover, these had just been installed when the decision to have microwave system as an additional/back up channel was taken. The Department had recently started improving

its reliability by ducting the underground cables. The Committee are of the opinion that it was preferable to have improved upon the functioning of the existing coaxial system than to have gone in for an additional medium at that stage. The Committee hope that in future the Department will be more circumspect in taking decision of this nature and in view of the limited resources should spend whatever resources are available on establishing new routes connecting additional cities, towns and villages.

3. 1-12 Do.

In view of the advantages of economy and higher reliability of the microwave system, in comparison with coaxial cable system, the Sarin Committee have recommended that barring certain exceptional situations, "all new routes should normally be set up using radio system" and "the erection of a new microwave route is to be preferred to the installation of a new coaxial route." The Committee desire that on account of distinct advantages of the microwave system, the recommendations of the Sarin Committee alongwith any further developments in technology in this regard should be kept in view while setting up all new routes.

4. 2-7
&
2-8 Do.

The Committee find that the implementation of the three microwave schemes has been considerably delayed and the schemes expected to be completed in 1982, 1980-81 and 1982-83 were still incomplete as on 31 July 1987. The Committee note that even after 5/6 years from the projected year of completion, the schemes remained incomplete and involved cost escalations ranging from 57% to 80% of the original estimated cost. Non-commissioning and delays in commissioning of the various sections of the schemes have also resulted in loss of potential revenue.

The Department of Telecommunications have tried to justify the delays by giving various reasons, such as non-receipt of supplies in time, delay in receipt of equipment, indigenous and imported, problems in acquisition of land especially forest; time taken in clearance of sites by Inter-Departmental Committee, i.e., the Standing Advisory Committee on Frequency Allocation (SACFA); delay in construction of buildings; delays in supply of power at the repeater stations; and such other factors. The Committee are of the view that reasons for these delays are not completely beyond control and in fact are only a pointer to the poor and unimaginative planning in execution of the projects. Delays in project implementation have grave financial and economic implications. While the Committee regret the delays in completing the projects, they urge upon the Government to ensure that there is no further slippage in completion of these projects. They also urge that monitoring mechanism in the Department should be tightened so as to ensure constant scrutiny of the progress of the projects/routes and take remedial measures whenever delay is anticipated so as to ensure timely completion of such projects.

5. 2-9 Ministry of Communications (Department of Telecommunications)

Forest Act which came into force in 1980 is stated to have hindered the progress of acquisition of forest land. All the projects were mooted long before 1980. Had advance action been taken for acquisition of land, it could have been acquired to synchronise with the progress of the projects. Thus, inaction, lack of initiative and lack of proper planning were the principal reasons for problems and delays in acqui-

sition of land. The procedure, practices and organisation involved in project construction, planning and implementation needs strengthening. The Committee need hardly emphasise the necessity of ensuring coordination between the various agencies of the Government.

6. 2-10 Do.

The Committee are of the opinion that even the delay in clearance of selected land for centre stations by the Inter-Departmental Committee could have been avoided or atleast minimised if the selection of the site was done by the Telecommunications Department in consultation with the Department of Civil Aviation or Defence Department from whom they might need clearance in the Committee. The Committee would urge the Government to consider the matter in depth in consultation with the concerned Ministries and Departments and to evolve a suitable mechanism so that technical suitability of land to be acquired is adjudged in advance and delay in acquisition of lands are avoided. The Committee would like to be apprised of further developments in this regard.

7. 2-11 Do.

During evidence the Secretary informed the Committee that project estimates are worked out on the basis of present-day costs and no provisions are made for escalations. In the opinion of the Committee this is an area which needs probing. In this connection the Committee note from the information supplied by the Minister of Finance in the Lok Sabha on 11-3-1988 that average yearly increase in wholesale prices during the Fourth, Fifth and Sixth Five Year Plans has been 9, 6.3 and 9.3 per cent respectively. In such a situation it is totally unrealistic to presume that cost of a project will remain unchanged even after 4 or 5 years, i.e. the scheduled date of completion of the project. The Committee,

therefore. emphasise that while formulating project estimates in future, the Department should carefully scrutinise their projects and while formulating feasibility reports, every care should be taken so that these are realistic and take into account the cost escalation due to normal rise in prices.

8. 3.5 Ministry of Communications (Deptment of Telecommunications)

The Committee find that the shortfall in revenue on the three projects as compared to the anticipations aggregated Rs. 87.05 crores upto 1985. Actual percentages of return on the three projects were zero, 17 and 9 against the anticipated percentage of 61.94, 33.63 and 16.54. The serious shortfall in the revenue and profits are mainly due to shortfalls in the traffic actually carried as compared to the traffic anticipated. This is indicative of the fact the projections of traffic and revenue in respect of all the three schemes were far from realistic. In view of the wide variations between the expected and actual results, the Committee are constrained to conclude that the three projects have been got approved on the basis of over optimistic projections.

9 3.6 Do.

The traffic and revenue projections in respect of all the three schemes have been widely off the mark. According to the Department, they had serious problems in traffic forecasting. The revenue has also been assessed on an *ad-hoc* basis as is evident from the fact that 50% credit of the traffic has been given to the microwave project without any rationale. The Committee hope that installation of automatic traffic measuring equipment in trunk automatic exchanges and analysis of traffic therefrom will facilitate rational assessment of traffic. They also hope tha

the study under taken by the Department to devise suitable means for traffic forecasting will result in more efficient traffic forecasting. It is imperative that suitable means are devised for correct traffic and revenue forecasting to assess the profitability of projects. Faulty forecasting may mean that profitable and socially and economically more desirable projects may be left out in favour of those which are less profitable and otherwise less desirable to implement. The Committee feel strongly that even though a long time has elapsed since intercity telecommunication network execution has started, the Department has not yet been able to devise suitable yardstick for determining the cost and revenue for such projects and consequently of the *inter se* priorities of different projects.
