

FIFTEENTH REPORT
STANDING COMMITTEE ON RAILWAYS
(1995-96)
(TENTH LOK SABHA)

MINISTRY OF RAILWAYS
(RAILWAY BOARD)

ELECTRIFICATION OF RAILWAY LINES

*Presented to Lok Sabha on 1.8.95
Laid in Rajya Sabha on 1.8.95*



LOK SABHA SECRETARIAT
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Minutes of the Tenth & Eleventh sittings of the Standing Committee on Railways (1994-95) held on 10 & 31 October, 1994; and Seventh sitting of the Standing Committee on Railways (1995-96) held on 18 July, 1995.

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**COMPOSITION OF THE STANDING COMMITTEE ON RAILWAYS
(1995-96)**

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Shri Somnath Chatterjee

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*Vacancy caused due to appointment of Shri A.R. Antuley as Minister.

**Vacancy caused due to death of Shri Tejsinghrao Bhonsle.

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1. Shri S. N. Mishra — *Additional Secretary*
2. Smt. Roli Srivastava — *Joint Secretary*
3. Shri T. R. Sharma — *Deputy Secretary*
4. Shri R. C. Gupta — *Under Secretary*

INTRODUCTION

I, the Chairman of the Standing Committee on Railways, having been authorised by the Committee to submit the Report on their behalf, present this 15th Report on "Electrification of Railway Lines".

2. During examination of the subject, the Committee have found that the Railways Electrification has been indentified as major priority area as it provides a modern, cost effective, energy efficient and environment friendly mode of transport. However, the electrification projects were delayed mainly due to non-supply of power by the respective State Electricity Boards/non-clearance from the Ministry of Environment and Forest/Telecommunication Department etc. The Committee have therefore recommended that appropriate and effective coordination among the concerned Ministries/Department should be established at the highest level to ensure timely completion of the Electrification projects of the Railways.

3. The Committee have also found that almost in every Five Year Plan there has been 'spill over' and 'thrown forward' of routes of Electrification projects. There have been mid-term reviews and reprioritisation of these projects. Therefore, the Committee have totally disapproved the present system and recommended that an appropriate perspective plan should be prepared to ensure that the Electrification projects approved for execution must be completed within the same Plan period.

4. The Committee have expressed their concern about the diversification of funds allotted for the Electrification projects to other areas resulting in delay in completion of these projects.

5. The Committee took evidence of the representatives of the Ministry of Railways (Railway Board) on 31 October, 1994 in connection with the examination of the subject. The Committee wish to express their thanks to the officers of the Ministry of Railways (Railway Board) for furnishing the material and information which they desired in connection with the examination of the subject and sharing with them their views concerning the issues which came up for discussion during evidence.

6. The report was considered and adopted by the Standing Committee on Railways on 18 July, 1995, ~~with same amendments/modifications as per Annexure.~~

7. The Minutes of the sittings of Committee held on 10 and 31 October, 1994 and 18 July, 1995 form Part II of the Report. For facility of reference, recommendations/observations of the Committee have been printed in thick type.

NEW DELHI;
18 July, 1995

27 Asadha, 1917

SOMNATH CHATTERJEE,
Chairman,
Standing Committee on Railways.

PART—I

REPORT

Introductory

It was almost 70 years ago that the first electric train ran in India with the inauguration of services between Bombay VT and Kurla Harbour on 3rd February, 1925 on Railway system. The section was electrified on 1500 Volt DC. Electric traction was subsequently extended on Central Railway upto Igatpuri on Northeast line and Pune on Southeast line where heavy gradients on the Western Ghats compelled introduction of electric traction. 1500 Volt DC traction was introduced on the suburban section of Western Railway between Colaba and Borivilli on 5.1.1928 and between Madras Beach and Tambaram of Southern Railway on 11.5.1931. Thus, before dawn of independence, Indian Railways had 388 KM of DC electrification.

2. In the post independence era, electrification of Howrah-Burdwan section of Eastern Railway was taken up on 3000 Volt DC during the First Five Year Plan period and was completed in 1958. As a result of extensive research and trials in Europe, particularly in French Railways (SNCF), 25 KV AC system of traction emerged as an economical system of electrification. Indian Railways decided in 1957 to adopt 25 KV AC system of electrification as a standard with SNCF as their consultant in the initial stages.

3. The first section to be electrified on 25 KV AC system was Raj Kharwan-Dongoaposi of South Eastern Railway in the year 1960. With a view to provide continuity of traction system, Howrah-Burdwan section of Eastern Railway and Madras Beach-Tambaram Section of Southern Railway were converted to 25 KV AC system by 1968.

4. In the wake of Industrial development in the Eastern region with the setting up of steel plants, necessitating large scale movement of Iron and Coal and resulting in substantial growth in freight traffic which could not be managed by steam traction, electrification and dieselisation had to be introduced in early sixties to cope up with the growing traffic. Railways were in a position to complete electrification of 216 RKM on 25 KV AC Traction during Second Plan period. During the Third Plan, alongwith considerable indigenisation, electrification was extended over another 1678 RKM. The pace of electrification, however, slowed down until the oil crisis of seventies. The second oil crisis in particular brought to the fore the need for evolving a long term policy for electrification to reduce the dependence of Railways on petroleum based energy.

5. Besides, Railway Electrification provides a modern, cost effective, energy efficient and pollution free mode of rail transport to meet the ever growing demands for heavy freight haulage, high-speed passenger travel and mass suburban transportation. Amid the uncertainties of fossil based energy and difficulties in procuring petroleum products at reasonable prices involving foreign exchange, Railway Electrification will go a long way in serving the interests of national economy in the transport section and therefore the Committee have taken up the subject for detailed examination.

Criteria for electrification

6. The electrification of a route is undertaken on techno-economic considerations of the traffic to be handled. Electric traction is superior to diesel traction in a number of aspects. The benefits accruing out of electrification are calculated to work out internal rate of return. Certain benefits like increase in line capacity, better throughput and increase utilisation of stock, better communication provided through underground cable alongwith Railway Electrification and environment friendly traction can not be precisely quantified and are ignored. If the specified financial retrun is available, the project is considered remunerative and eligible for Railway Electrification.

7. Regarding priority in selection of the routes for electrification, the Ministry of Railways have stated that the pace of electrification on Railway requires to be stepped up to reduce Railway's dependence upon petroleum products. Electrification of high traffic density routes is a priority area and electrification is a continuous process. Electrification projects are undertaken on techno-economic considerations and operational requirements. As electrification projects are capital intensive, only high traffic density routes which qualify based on rate of return on investment are taken up for electrification. Such routes are identified and priorities drawn up on the basis of operational benefits.

8. When the Committee wanted to know about the Railway Board's thinking or perception regarding electrification, desirability and degree of importance of electrification schemes, the Ministry have in their written reply, stated as under:

"Railway electrification has been identified as a major priority area as it provides a modern, cost effective, energy efficient and environment friendly mode of rail transportation to meet the growing demand for heavy freight haulage, faster passenger travel and mass suburban commuter traffic. Besides, electrification of track brings about a reduction in the Railway's demands for the limited petroleum based products which are essential for certain other modes of transportation. Railway electrification, however, being capital intensive, has to give a return on the investment. Hence only sections having high density of traffic are considered for electrification".

Implementation

9. Electrification on Railways results in reduced energy cost. There are other benefits like reduced locomotive maintenance cost, increase in train speeds due to higher horsepower of electric locomotives, some increase in line capacity, higher availability of electric locomotives and increased utilisation potential of locomotives as compared to diesel traction. Potential benefits from electrification are greater on difficult terrain and in operation of fast passenger services.

10. Benefits from electrification increase with the traffic level whereas investment in fixed assets is largely independent on traffic. There is thus, a break even point above which electric traction becomes economically viable as compared to diesel traction. The break-even level varies widely for different lines and is sensitive to opportunity cost of capital, cost of fixed installation, cost of diesel fuel and cost of power. Financial & Economic viability of electrification of a section has, therefore, to be determined by a 'Line Specific Study'.

11. Electrification on Railways also offers an opportunity for oil substitution in the transport sector.

12. As on 31 March, 1994, 11793 RKM are under operation in electric traction. It is estimated that it would be possible to electrify further above 8000—10000 route Km. (20,000 to 24,000 track Km.) by the end of this century.

13. When enquired whether any study has been made of sections, which should be electrified, the Ministry of Railways, in their written reply, stated:

"Based upon the study of patterns of traffic and the projections made for the period 1985—2000, the corporate plan envisaged electrification of 8000 to 10000 route kilometres. The routes to be electrified are identified on the basis of density of traffic to execute the railway electrification work. Electrification is progressing generally according to plans. The traffic movement is continuously monitored and sections in which traffic density is high and requires electrification from the point of view of operational network is ordered to be surveyed for techno-economic evaluation. If the cost-cum-feasibility of the section shows an acceptable rate of return, the section is proposed for electrification in the order of priority."

14. When further asked whether there is any proposal for study for electrification of the following lines:

- (i) Kharagpur-Visakhapatnam
- (ii) Lucknow-Kanpur
- (iii) Khandwa-Nimach
- (iv) Ratlam-Bhopal
- (v) Moradabad-Lucknow-Varanasi-Mughalsarai
- (vi) *Jhajha-Mughalsarai

- (vii) *Bhagalpur-Patna-Mughalsarai
- (viii) Sealdah-New Jalpaiguri
- (ix) Howrah-Bolpur-Sahebganj
- (x) Ahmedabad-Viramgam
- (xi) Karjat-Khopoli

and if so, whether any survey has been made on these lines, the Ministry in their written reply have stated as under:

(i) Kharagpur-Visakhapatnam	Survey has been completed. Electrification of Kharagpur-Bhubneshwar/Khurda Road section is awaiting approval of Planning Commission.
(ii) Lucknow-Kanpur	Survey has been completed.
(iii) Khandwa-Nimach	No proposal at present.
(iv) Ratlam-Bhopal	Electrified.
(v) Moradabad-Lucknow-Varanasi-Mughalsarai	Survey have been completed.
(vi) *Jhajha-Mughalsarai	Under electrification.
(vii) *Bhagalpur-Patna-Mughalsarai	While Patna-Mughalsarai is under electrification. Bhagalpur-Patna has not been surveyed yet.
(viii) Sealdah-New Jalpaiguri	Not surveyed due to lower priority.
(ix) Howrah-Bolpur-Sahebganj	Not surveyed due to lower priority.
(x) Ahmedabad-Viramgam	Not surveyed due to lower priority.
(xi) Karjat-Khopoli	Proposed for including in works programme 1995-96.

15. After the electrification of select trunk routes during VII Plan, the main objective of the VIII Five Year Plan is to shift the emphasis to the following objectives for the electrification programme:

1. Heavy freight routes like Bina-Katni-Bilaspur and Gomia-Sonnagar.
2. Alternate routes like the 'B' route of N. Rly., Mughalsarai-Lucknow-Saharanpur-Ludhiana.
3. Operationally needed links between electrified sections so as to overcome constraints in the flow of traffic on account of change in traction.

*Electrification of Sitarampur-Patna-Mughalsarai sections is an approved work. Anticipated cost of this work is Rs. 240.4 Crore. The Jhajha-Mughalsarai and Patna-Mughalsarai sections are parts of the above sections, which are expected to be completed by March, 1999.

16. When asked about the target and achievements for electrification of lines in different plan period and specially in the VIII Plan, the Ministry of Railways furnished in their written reply as under:

Plan-wise achievement of electrification vis-a-vis targets

	Target	Achievement
Prior to II PLAN		529
<i>II PLAN</i>		
1956-61	N.A.	216
<i>III PLAN</i>		
1961-66	N.A.	1678
<i>ANNUAL PLANS</i>		
1966-69	N.A.	814
<i>IV PLAN</i>		
1969-74	N.A.	953
<i>V PLAN</i>		
1974-78	N.A.	533
<i>INTER PLAN</i>		
1978-80	N.A.	195
<i>VI PLAN</i>		
1980-85	2800	1522
<i>VII PLAN</i>		
1985-90	3400	2812
<i>ANNUAL PLANS</i>		
1990-92	1715	1557

17. The target for electrification for the VIII Plan was fixed at 3500 Route Kms. but due to reduced allocation of Rs. 1350 crores against Rs. 1700 crores required, the target had to be scaled down to 2700 Route Kilometers.

18. In 1992-93 ~~^479~~ Route Kms. were electrified against the target of 500 Route Kms.

19. In 1993-94 against a target of 600 Route Kms., 505 Route Kms could be electrified because the allocation was reduced from Rs. 280 crores to Rs. 245 crores. The Ministry of Railways have stated that unless adequate funds are made available the present target may also have to be reduced.

20. The following electrification schemes have been approved in the VIII Plan:—

<i>Schemes</i>	<i>RKM</i>
Ambala-Moradabad	274
Vijaywada-Visakhapatnam incl. Samalkot-Kakinada Port	366
Erode-Palghat-Ernakulam incl. Cochin Harbour Terminus	324
Renigunta-Guntakal-Hospet and Torangallu-Ranjitpura Branch Line	448
Chandil-Muri-Barkakana	119
Jamadoba-Mohuda	22
Bandel-Katwa	105
Adra-Midnapur	155

21. The Ministry of Railways also furnished the List of different sections which have already been fully electrified:—

<i>Sections</i>	<i>Total RKM</i>
<i>I. Eastern Railway</i>	
(i) Howrah-Barddhaman (both main and cord) Asansol-Mughalsarai	1366
(ii) Suburban section of Calcutta (SDAH / HWH)	
(iii) Sonnagar-Patraru (Part Section)	
(iv) Chandrapura-Complex (Part Section)	
<i>Sections</i>	<i>Total RKM</i>
<i>II. Central Railway</i>	
(i) Delhi-Bombay via Central Railway Route	2858
(ii) Itarsi-Nagpur-Wardha-Balharshah	
(iii) Wardha-Bhusawal	
(iv) Kalyan-Pune	
(v) Bina-Katni	
(vi) Suburban section of Central Railway around Bombay	
<i>III. Northern Railway</i>	
(i) Delhi-Ghaziabad (both routes) Kanpur-Mughalsarai	942
(ii) Delhi ring railway	
(iii) Delhi-Sonepat	
(iv) Tundla-Agra	
(v) Aligarh-Haridwar	

IV. Southern Railways

(i)	Gudur-Madra-Ernakulam-Erode incl.		968
	Salem-Mettur Dam Br. Line		
(ii)	Jollarpetai-Kengeri		
(iii)	Arakanam-Renigunta		
(iv)	Suburban-Madras		

V. South Central Railway

(i)	Gudur-Vijaywada-Balharshah		1064
	incl. Guntur-Tenali		
(ii)	Kazipet-Sanatnagar		
(iii)	Gudur-Renigunta-Tirupati		

VI. South Eastern Railway

(i)	Howrah-Kharagpur-Tatanagar-		2802
	Durg-Nagpur		
(ii)	Asansol-Adra-Chandil-Sini-Rajkharwan-Dangoaposi-		
	Barajamda-Gua/Barajamda-Bolanikhadan		
	Padapahar-Banspani		
(iii)	Waltair-Kirandul incl.		
	Damanjodi-Koraput		
(iv)	Champa-Garwa Road		
(v)	Rourkela-Pimpri		
(vi)	Kharagpur-Midnapur		
(vii)	Suburban Sections of Calcutta on the S.E. Rly.		
(viii)	Bilaspur-Katni		
(ix)	Annupur-Chhirimiri/Bishrampur Chandrapura-Complex-Talgaria-Tupkadiah		

VII. Western Railway

(i)	Mathura-Kota		1793
(ii)	Ratlam-Baroda-Bombay Central		
(iii)	Anand-Godhra		
(iv)	Baroda-Ahmedabad-Gandhinagar		
(v)	Nagda-Bhopal		
(vi)	Agra-Payana		

Total 11793

22. When asked further about the details of physical and financial progress in respect of each of the electrification project, of VIII Plan, the Ministry stated as under:—

S. No.	Project	Year of W.P.	Length K.M.	Expend. upto March-94 (Rs. in crores)	Target	Remarks
1.	Ambala-Moradabad	1992-93	274	11.34	March 98	Preliminary works in progress
2.	Vijayawada-Visakhapatnam	1992-93	366	5.31	March 97	Works in progress
3.	Erode-Ernakulam Cochin Harbour Terml.	1992-93	324	11.80	March 98	Preliminary works in progress
4.	Renigunta-Guntakal-Hospet (incl.) Ranjipura-Tornagellu	1992-93	448	3.22	March 98	Preliminary works in progress
5.	Chandil-Muri-Barkakana	1992-93	119	—	March 97	Preliminary works in progress
6.	Jamadoba-Mohuda	1992-93	22	0.02	March 98	Preliminary works in progress
7.	Bandel-Katwa	1992-93	105	1.05	March 97	Work in progress
8.	Adra-Midnapur	1993-94	155	—	—	Approved work Clearance awaited from Planning Commission.

23. The Railways have scaled down the target of electrification from 3500 RKM to 2700 RKM. The Committee enquired about the reasons for accordinng higher priority to various projects selected for electrification and how much of RKM of this total 2700 RKM were spill over from the earlier Plan and how much of 2700 RKM has been completed by 31 October, 1994, the Ministry in their written reply, stated as under:

“Originally an outlay of Rs. 45,6000 crores was formulated for VIII Plan. Consequent upon reduction in the outlay the allocation for RE also was reduced from Rs. 1709 Cr. to Rs. 1350 Cr. and therefore,

the projects were prioritised with a view to making most of them operational in the VIII Plan.

The target of 2700 RKM comprised the following sections in the order in which they are expected to be completed based on operational network and to obtain through electrification characteristics:—

<i>Sections to be completed in the VIII Plan</i>	<i>RKM</i>
1. Gandhinagar-Sabarmati	28
2. Kazipet-Sanatnagar	68
3. Bina-Katni	263
4. Katni-Bilaspur	502
5. Sonnagar-Patraru	291
6. Delhi-Ambala-Ludhiana	314
7. Gumia-Patraru	72
8. Vijayawada-Visakhapatnam	366
9. Bandel-Katwa	105
10. Chandil-Muri-Barkakana	119
11. Jamadoba-Mohuda	22
12. Branch Lines	187
13. Bokaro-Muri-Barsuan/Kiriburu	398
14. Erode-Ernakulam	324
15. Sitarampur-Mughalsarai	562
16. Ambala-Moradabad	274
17. Adra-Midnapur	155

While all the sections from 1 to 12 will be completed by 31.3.1997, sections at S.No.13 to 16 will be partially completed to the extent of 415 route kilometers to achieve the target of 2700 RKM. The Adra-Midnapur section is yet to be cleared by Planning Commission.

The spill over as on 1.4.1992, the beginning of VIII Plan is 2498 RKM.

1010 RKM have been completed as on 31.10.1994."

24. When the Committee further enquired what would be the carry forward at the beginning of the IX Plan, the Ministry have in their written reply, stated:—

"As on 1.4.1992 a route kilometrage of 2498 of work was in hand. During the VIII Plan a route kilometrage of 2000 was approved for electrification. If 2700 route kilometer are electrified during the VIII

Plan, the left over work is expected to be 1798 route kilometre. In addition following schemes are under consideration for inclusion in the balance period of the VIII Plan.

1. Kharagpur-Bhubneswar/Khurda Road (including Talcher-Paradip Branch Line) (Proposal is with Planning Commission)	540 RKM
2. Saharanpur-Khurja	208 RKM
3. Gaya-Patna	92 RKM
4. Kanpur-Lucknow	74 RKM
5. Bhubneswar/Khurda Road-Visakhapatnam	443 RKM
	1357 RKM

If these five schemes are approved, route kilometre that would be carried forward would be 3155.

25. Asked whether the plan allocation will lapse, the Chairman, Railway Board stated:

"The plan allocation does not lapse but you must have that much of shelf so that the programming and planning could be carried out in order to get a physical progress of 500 to 600 kilometres per year. *

We shall complete those which were carried forward from the earlier Plans and we would also include a large shelf of projects per year in the Ninth Plan".

26. When asked why the Railway Board felt that the target fixed for the Eighth Five Year Plan should be revised, the Chairman, Railway Board stated:

"There were two basic considerations. One was that we had another matching perspective plan for the development of Indian Railway to put in air brake stock and with the air brake stock our trailing loads were getting to a level of 4,700 tonnes as against the originally designed box wagons which would have come to 3,600 tonnes. Therefore, it was felt that by diesel locomotives which we were having at that particular point of time would not really match this particular trailing load. So, the thought was that as normal development of transportation strategy to carry more than the target and put in a little more increases in the trailing per train and therefore confine the number of trains for the same tonnage we should go in for electrification because electrification provided us with the alternative strategy to be able to haul a much higher trailing load."

27. When the Committee enquired, why the target for the electrification was reduced from 3500 kms. to 2700 kms. as the target for electrification

was not reduced by the Planning Commission, the Chairman, Railway Board stated:

"This is the point which I was trying to emphasise that the electrification projects have a very long gestation period. Therefore, sanction of a particular project and its inclusion into the plan of a particular project or into the budget also is only an enabling exercise."

28. The Committee observe that the availability of funds is not the main problem. However, after the finalisation of the project again reprioritisation is made due to weak infrastructure in the railway electrification organisation. The Chariman, Railway Board clarified the position as under:

"For the project that we will take up during the Plan period itself, there is a small percentage of this which can be completed within the Plan. Therefore, funding of the Plan is basically for completion of the target."

29. When asked how the Ministry do reprioritisation, the Chairman Railway Board stated:

"Not exactly reprioritisation. What we do is that we keep a shelf of projects, in the sense that we carry out the surveys of the routes which would otherwise qualify for electrification and prepare the project report and then, according to the development and availability of the funds, we propose that a particular project can be included."

30. When further asked at which stage the project report is prepared and whether it is prepared prior to the draft plan shown to Planning Commission, Chairman Railway Board stated:

"Yes, Sir, for example, when the draft plan was made out for Rs. 45,600 crore, then all the projects for the 3,500 route kilometres, were identified. On that basis we also took the priority action of doing the surveys and preparing the project reports. Thereafter, when the total funds were curtailed, then the question came as to which 800 kilometres would be deleted from the plan."

31. Enquired about the process adopted for deleting 800 route Km. from the VIIIth plan, the Chairman, Railway Board stated:

"We would answer it in two different ways. One is the routes which were originally considered for electrification and were included in the original plan of 3,500 route kilometres and finally scaled down to 2700 kilometres electrification. The other alternative could be that we can say which out of these 3500 were selected and given a higher priority."

32. To a question whether the electrification projects could be completed within the stipulated time if the funds were made available, the Chairman, Railway Board replied:

"It will make a little difference. The time taken for a particular project is to the extent of five to seven years."

33. Enquired whether the period can be reduced by strengthening electrification wing and the requisite infrastructure, the Chairman, Railway Board stated:

"The infrastructure and other thing can only do monitoring. It can only do acceleration as far as supervision is concerned. But the work itself takes that much of time. In some cases, it is delayed because of the State Electricity Board and in some cases because of Department of Telecommunication. Our experience has been it takes about five to seven years for an electrification project to get executed. Therefore, part of that fund goes for funding and completing the projects which are in progress in hand and some for whatever projects taken up during the plan."

Giving an example of Barddhi-Katwa section of Eastern Railway, he amplified the position as under:

"It has very little implication as far as the State Electricity Board is concerned. Power could be made available up to a certain point only. That is why, when we were thinking about how to phase out the particular project, we thought up to Jerat only it could be done. Beyond Jerat, power was not available. These are the types of projects which physically cannot be done totally. It may be covering 300 Kms. at a stretch but we may be able to complete 40 Kms. Therefore, the question asked by the Hon. Chairman also, whether in this particular plan, you will do only 600 Kms. of those projects which would be approved, sanctioned and taken up for execution during the plan period. Even if we are capable of doing by striving hard, if power is not available, other matching facilities are not available, then it is difficult. Power may be available. But we may require transmission line for taking that power. If it is 300 kms. line, you require a substation from where the power would be distributed. Reaching power to those substations takes time. In Dhanbad-Gaya section, there are two substations where we are not able to get power because forest clearance has not come. Transmission of power could not be done. Electrification projects are complicated projects unlike other projects which are totally within our control. We can lay line and do that. Our experience is, an electrification project takes about five to seven years."

34. From the information given by the Ministry, the Committee found that even the annual targets were not being achieved. The Committee therefore, desired to know as to how much route km. the Ministry of Railways proposed to electrify and what they thought, could be done, the Chairman Railway Board stated:

"Funds are not available till now, it was essentially due to the tardy progress of the contractors. That is very minuscule feature. But basically it is on the basis of the progress really achievable by the contractors and with some of the major contractors we had a little problem."

35. According to the Railway Board, generally an electrification project takes 5-7 years for its completion. The Committee wanted to know whether the delay was mainly due to (i) lack of coordination among the Ministries/Deptts./agencies concerned or (ii) lack of funds or (iii) lack of proper supervision of the progress of the projects. The Ministry, in their written reply, stated as under:—

"After approval of a work for inclusion in the works Programme, the designs, drawings and detailed estimates are prepared after a detailed survey. The progress of land acquisition, finalisation of power supply arrangements with State Electricity Boards, arrangements for shifting of Deptt. of Telecom lines and State Electricity Board lines which are in the vicinity of the railway track etc. are progressed together. Simultaneously, action for procurement of materials, finalising tenders for work contracts is undertaken. This takes upto two years. Then, the physical works like mast erection, stringing of catenary and contact wires construction traction substations, modifications of signalling, erection of remote control centre etc. are undertaken subject, of course, to availability of sufficient funds for the project in time. It takes 5-7 years upto commissioning."

The Ministry further stated that the period of completion of a project can be reduced to 4-5 years if adequate funds are given in time. The delay is not due to lack of coordination nor of proper supervision. It is mainly due to lack of funds.

36. It has been stated by the Ministry of Railways that during the year 1993-94, funds earmarked for electrification were diverted to some other works. When the Committee enquired the reasons for diversion of funds, the Ministry stated in their written reply:

"Reallocation was done in view of reduced internal resource generation. Allocation was reduced from Rs. 280 crores to Rs. 246 crores and later increased to Rs. 277.75 crores and this was done at Board's level."

37. The Committee asked about the terms and conditions of contract between the Railway and the Contractor for an electrification project and whether there had been any provision for extension of time. They also wanted to know the action taken by the Ministry of Railways against the

contractor in case he fails to complete the project in estimated time. The Ministry, in their written reply, stated as under:

"Standard conditions of contract exist in the Indian Railways and all contracts are governed by these depending upon specific needs of a project and also local conditions, special conditions in addition to the standard conditions are incorporated in the agreement.

Generally the time limit for completion of electrification project could not be adhered due to non-availability of funds. Railways are unable to release sufficient funds to the contractors, which leads to failure of a contractor in carrying out the work. For instance in some of the recently completed projects average time over run has been around 24 months taking project completion period around as 5-7 years. Cost over run has been about 70 percent

The Conditions of contract provide for extension of time. This is granted by the Railways only after being fully satisfied as to the reasons for the same and without causing loss to Railways."

38. In reply to question whether the Ministry recovered liquidated damages from the contractors in case of non-completion of a project within the stipulated period and if so, the total amount recovered from them so far, the Ministry stated:

"Levying of liquidated damages is stipulated in all contracts. Detail of liquidated damages if any, imposed on contractors during the last three years are being collected."

39. When the Committee asked the Railway Board about their thinking on electrification and how far it is achievable, since electrification has got various facets, the Chairman, Railway Board stated:

"Your question includes quite a few aspects of electrification. As I said, till now, our perspective about "electrification is cost-effectiveness. If you, recall in one of the other meetings, we had mentioned that way back in 1988-89, a lot of appraisals had been done.

A lot of appraisals have been done as to what should be the break-even point. Studies have shown that electrification has become cost effective. That is why the East Coast Line as well as in the South, Madras to Ernakulam and from Delhi to Ludhiana Lines may not totally qualify, but one can give weightages for other aspects of electrification, that is, consumption of diesel not being very environment-friendly and also to some extent provide a slightly more superior traction. Therefore, certain other projects do start qualifying when you start looking at it. But the point made by you is that one have as a matter of policy considered certain weightages to be given to these aspects of electrification in order to appraise the project from the point of view of

justifiability and otherwise. That is one aspect. We have not yet taken a comprehensive view on this."

The witness further added:

"I would like to make a point for the consideration of the Committee. As we stand today, electrification does provide an option for superior traction. From the point of speed and hauling capacity, it is no way decrying the capability of the diesel traction. One can do the same thing with the diesel. But as far as electrification is concerned, since we do not have the matching diesel available in the country, it does provide a certain option and perhaps this could be one of the basic criteria. It is a question of particular hauling capacity of diesel and that particular capacity we do not have in our rolling stock."

40. Asked whether the electrification project was cost effective or not, the witness stated:

"It is cost effective in the sense that total cost per GTKM electric traction is cheaper than the diesel traction.

That is how we are looking at it uptill now. That is why the studies in the past have been done to know what is the break even point. Up to a point diesel traction is cheaper and beyond that electrification becomes cheaper because of capital intensiveness."

41. The Committee have been informed that many hindrances come when they choose a particular route for electrification. To a question whether the Ministry of Railways hold any meetings with the Ministry of Power/Ministry of Industry to execute a particular plan without any hindrances, the Chairman, Railway Board replied:

"We do that, Coordination meeting is held with all the agencies which are contributing towards the progress of the project."

Elaborating the point further, he stated:

"We field a project to the Planning Commission after tying up the availability of power with the Ministry of Power as well as Department of Telecommunications about changing the communication system. Unless the Power Ministry gives its clearance about the availability of power or the State Governments say that they will be able to give us the power, we will not field the project."

Electric Supply Sources

42. At present, electric supply for traction is being taken from State Electricity Boards/Electricity Authorities. The Ministry of Railways have stated that most of the State Electricity Boards are not in a position to

adhere to the targets for making power supply available to the Railways various traction sub-stations. With the result that either electrification project is delayed or the availability of power supply at all traction sub-stations cannot be made available. When the Committee enquired whether the Ministry of Railways have taken up the matter with the State Electricity Boards to adhere to the targets for making power supply available to them, the Ministry in their written reply stated as under:

“Constant liaison is maintained by Zonal Railways and at Railway Board's level with the State Electricity Boards to ensure timely availability of power supply before railway electrification schemes.”

43. The Ministry of Railways have also stated that there have been many cases of grid failure in the recent past resulting in loss of power supply to a large number of traction sub-stations which led to complete dislocation of traffic at different places in Northern, Eastern and Southern Regions. When asked how far the State Electricity Boards were responsible for grid failures and what concrete action has been taken to get over the above malady so as to ensure the smooth supply of power, the Ministry of Railways have in their written reply stated as under:

“Ministry of Railways is not aware of the extent to which the SEBs are responsible for the grid failures. Ministry of Railways had approached the Ministry of Power to conduct an in-depth study with a view to pinpointing the causes of grid failures so as to evolve appropriate remedial measures. Accordingly, Ministry of Power had appointed Inquiry Committees to pinpoint the causes of Grid Failures and remedial measures. In their reports, the Ministry of Power had brought out certain aspects like inadequate maintenance, inappropriate protection schemes, inadequacies of load management devices, improper islanding schemes of the SEBs leading to grid failures.”

44. The Ministry of Railways have informed the Committee that possibility of taking power directly from NTPC/NHPC on some of the ongoing electrification projects and using Railways own transmission lines is under consideration since the tariff for power supply from NTPC/NHPC is cheaper than that of Electricity Boards. Asked whether the Ministry of Railways had consulted the public sectors directly, the Chairman, Railway Board stated during evidence:

“We had a dialogue with the NTPC on this and we are under the stage of negotiation of the terms and conditions.”

45. The power tariff varies from State to State. The Committee therefore wanted to know whether the Railways were considering to have its own captive power plant to get the adequate power supply, the Chairman Railway Board stated:

“We do not have any proposal for Captive power plant. Our

requirement is so small that the economics of scale will not permit this. When you take the entire network as a whole, it could be considerable number. But, system-wise, it is very small; it would not be a proposition worth considering at this particular moment."

Technology Upgradation

46. The Ministry of Railways have stated that 2×25 KVAT system of electrification has been introduced in one section on Indian Railways for the first time. With this, Indian Railways have joined the select band of advanced countries using this technology. When the Committee enquired about the salient features of this system of electrification, the Ministry in their written reply stated as under:

" 2×25 KV system is being installed as a pilot project. Transmission of power in 2×25 KVAT system takes place at 50 KV while the electric locomotives still work at 25KV. Larger amounts of power can be handled due to increase in transmission voltage. Auto transformers are provided at regular intervals to maintain voltage levels and to reduce interference with Signal and Telecommunication installations. 2×25 KV system is being installed on Bina—Katni—Anuppur Bishrampur/Chirimiri sections of Central and South Eastern Railways. This particular section was selected because of heavy haul freight trains on this route carrying coal traffic from CIC sections to Western India."

47. It has also been stated that with a view to bring down the maintenance cost and improve the reliability of power supply system, Railways have gone in for state-of-the-art technology as prevalent in the international arena.

Observations/Recommendations

48. The Committee note that Railway electrification has been identified as a major priority area as it provides a modern, cost effective, energy efficient and environment friendly mode of rail transport. However, they are concerned to note that the Electrification Projects are delayed inter alia due to non-supply of power/non-clearance from the Ministry of Environment and Forests/Telecommunication Department etc. The Committee strongly recommend that a proper and effective coordination among the concerned Ministries/Departments should be established at the highest level to ensure timely completion of Electrification Projects. In case of failure on the part of any Ministry/Department, responsibility should be fixed upon the erring Ministry/Department concerned.

49. The Committee find that almost in every Five Year Plan there is "spill over" and "thrown forward" of routes of electrification projects. There are mid-term reviews and reprioritisation of these projects. The Committee totally disapprove the present system and recommend that a proper perspective plan should be prepared regulating electrification in the

Indian Railways and steps should be taken to ensure that an electrification project approved for execution must be completed within the same plan period or within stipulated period.

50. The Committee also find that generally an Electrification Project takes about 5-7 years for its completion. During evidence the Chairman, Railway Board informed the Committee that the main reason for delay in completion of an Electrification Project is lack of funds. The Ministry of Railways, in their subsequent written reply, stated that if the funds are made available in time, the period of completion of an Electrification Project can be reduced to 4 to 5 years. The Committee therefore, recommend that sufficient funds should be provided in time so that gestation period could be reduced.

51. The Committee observe the delay in the completion of an electrification project is attributed mainly to lack of funds. However, from the material furnished to them, the Committee found that the funds allocated for electrification projects were diverted to some other projects other than electrification. The Committee take a serious view of the fact that the Ministry of Railways have diverted the funds which had been allocated for important electrification projects vitally necessary for providing efficient service to the people.

52. The Committee note that there are standard terms and conditions according to which contracts for electrification projects are agreed to. However, liquidated damages recovered from the contractors who failed to complete the electrification projects within stipulated time were not furnished to the Committee. The Committee desire to know the details of the liquidated damages recovered during the last 10 years, year-wise and contractor-wise.

53. The Committee also note that there have been many cases of grid failure resulting in loss of power supply to large number of sub-stations which lead to dislocation of the traffic at different places. They have also found that the question of taking power directly from NTPC/NHPC has been under consideration of the Ministry of Railways since long. It is incomprehensible to the Committee as to why the matter has not been finalised so far. The Committee strongly recommend to finalise the matter regarding taking power supply directly from the above agencies on an urgent basis so as to ensure proper and timely supply of power.

54. The Committee note that surveys for electrification in respect of the lines viz. (i) Kharagpur-Visakhapatnam, (ii) Lucknow-Kanpur, and (iii) Moradabad-Lucknow-Varanasi-Mughalsarai have already been completed. The Committee strongly recommend that these lines should be included in the works programme of the Ministry of Railways for the current plan and definitely for IXth Five Year Plan. They are also of the view that adequate funds should be provided by the Ministry of Railways for the projects cleared by the Planning Commission.

ANNEXURE

Amendments/Modifications made by Standing Committee in the Draft report Fifteenth report on "Electrifications of Railway Lines"

Page	Para	Line
1	2	3
36	51	<p>Substitute the following for existing paragraph: The Committee observe the delay in the completion of an electrification project is attributed mainly to lack of funds. However, from the material furnished to them, the Committee have found that the funds allocated for electrification projects were diverted to the projects other than electrification. The Committee take a serious view of the fact that the Ministry of Railways have diverted the funds which had been allocated for important electrification projects vitally necessary for providing efficient service to the people.</p>
37	54	<p>Substitute the following for existing paragraph: The Committee note that surveys for electrification in respect of the lines viz. (i) Kharagpur-Visakhapatnam (ii) Lucknow-Kanpur and (iii) Moradabad-Lucknow-Varanasi-Mughalsarai have already been completed. The Committee strongly recommend that these lines should be included in the works programme of the Ministry of Railways for the current plan and definitely for IXth Five Year Plan. They are also of the view that adequate funds should be provided by the Ministry of Railways for the projects cleared by the Planning Commission.</p>
38	55	<p>Substitute the following for existing paragraph: The Committee desire that necessary surveys for electrification of the following lines/routes may be conducted at the earliest and where electrification of any of the above lines/routes has been cleared by the Planning Commission, adequate funds should be provided for the same:—</p> <ul style="list-style-type: none">(1) Sealdah-New Jalpaiguri(2) Howrah-Bolpur-Sahebganj(3) Ahmedabad-Viramgam(4) Sahebganj-Bhagalpur-Patna(5) Ernakulam-Trivandrum Via Kottayam & Quilon

1	2	3
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- (6) Kanpur-Gorakhpur
- (7) Bhagalpur-Kiul
- (8) Miraj-Vasco de Gama
- (9) Sudamdih-Dhamyad
- (10) Khandwá-Nimash
- (11) Indore-Ujjain
- (12) Ghaziabad-Saharanpur-Rurkcc-Dchradun
- (13) Delhi-Bikaner

56 The Committee find that the Railways have started to introduce 2×25 KVAT system of electrification with a view to bring down the Maintenance cost and to improve the reliability of power supply system, the Railways have adopted state-of-the-art technology as prevalent in the international area. The Committee hope that new technology would be continued to be inducted in the Indian Railways.

NEW DELHI;
18 July, 1995

27 Asadha 1917 (Saka)

SOMNATH CHATTERJEE,
Chairman,
Standing Committee on Railways.