

*Study of*  
*Relative Economics*  
*of*  
*Diesel & Electric Traction*  
*on*  
*Indian Railways*



मह्यमत्र जपने

GOVT. OF INDIA  
MINISTRY OF RAILWAYS

*June, 1978*

GOVERNMENT OF INDIA (BHARAT SARKAR)  
MINISTRY OF RAILWAYS (RAIL MANTRALAYA)  
(RAILWAY BOARD)

No.77/RE/138/6

New Delhi, dated 23 -2-1979.

1. The General Managers,  
All Indian Railways.
2. The Director General,  
R.D.S.O., Lucknow.
3. The Principal,  
Railway Staff College,  
Baroda.
4. The General Manager,  
M.T.P., Calcutta.
5. C.A.O. (R),  
M.T.P., Bombay.
6. C.P.O.,  
M.T.P., Delhi.

Re: Study of Relative Economics of  
Diesel & Electric Traction on  
Indian Railways (June'78).

The Railway Board appointed a Committee in December, 1977 to study the relative economics of Diesel & Electric Traction. The Committee submitted its Report titled "Study of Relative Economics of Diesel & Electric Traction on Indian Railways in June 1978 (Raj Committee Report)". The report was examined by the concerned Directorates of the Railway Board.

2. On receipt of the comments of the Directorates the Board constituted a High Level Committee to go into the details of the Report and the comments received from the Directorates. After carefully examining the Raj Committee Report and the Reports of the High Level Committee, the Board have taken the following decision:-

- "(1) The original Report made by Shri J.A. Raj on the relative economics is accepted in principle. As the relative economics comparison between Diesel and Electric Traction will continue to vary from time to time, it would be necessary to examine each and every proposal for electrification on its own merit. The following broad

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principles have to be followed:-

- (a) The break-even level for taking up sections for electrification could vary between 30.00 and 35.00 million GTKM per route km. per annum.
  - (b) It should be on a route basis, for example, our next step should be to concentrate on the route from Bombay to Delhi, with Delhi-Mathura, and Vadodara-Ratlam already included for electrification. The Board felt that the high density main trunk routes between the four metropolitan cities of Delhi, Calcutta, Bombay and Madras and the routes from Delhi to Madras and Bombay to Calcutta would have to be eventually electrified depending on the availability of resources.
  - (c) While preparing electrification schemes, it should be our objective to eliminate steam for the smaller services, suitably replacing them by Diesel Shunters (WDS6) or wiring the lines as required. It is accepted that over a long period, which would be required to provide electric traction (being capital intensive), both Diesel and Electric Traction have to be developed and can be sustained.
- (ii) On the subject of Colour Light Signalling being included in electrification project estimates, the Committee's Report that the cost of electrification for purpose of comparison with dieselisation, should not include the cost of Colour Light Signalling, is accepted. However, Colour Light Signalling should form part and parcel of electrification, in as much as electrification projects are being taken up on high density routes and there is no question of not providing Colour Light Signalling.

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(iii) In the Corporate Plan for the development of Railways, both Electric & Diesel Locomotives have to be provided for in ample measure, duly phasing out steam traction in a gradual manner."

3. Copies of Raj Committee Report are available with CE/RE, Northern Railway, Allahabad, who is being instructed to distribute the necessary number of copies as available to the Zonal Railways.

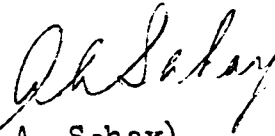
4. Railway Electrification proposals may be prepared keeping in view the details worked out by the Raj Committee Report and the decision of the Board thereon.



(A.A. Sahay)  
Joint Director, Rly. Electrification(E),  
Railway Board.

No.77/RE/138/6                      New Delhi, dated                      23-2-1979.

Copy to CE/RE, Northern Railway, Allahabad.  
He may arrange to distribute copies of Raj Committee Report to the Railways.



(A.A. Sahay)  
Joint Director, Rly. Electrification(E),  
Railway Board.

Copy for information to:-

PS/CRB, FC, ME, MM, MT, Adv. Finance, Adv. Elec.  
DRP, DEB, DEE, DST, EA, DF(B), DIT,  
DS&C & DME.

## FOREWORD

Economic haulage of trains has been under constant study on the Indian Railways for a very considerable period. With the introduction of diesel and electric traction in 1950s, the subject gained more importance and caught the attention of traction Engineers of different disciplines to go deeper into the problems.

The quest led to a "Study of electrification and dieselisation on Indian Railways" in 1963 commonly known as the Sahai Committee Report. Subsequently in 1970 the National Council of Applied Economic Research conducted a similar study.

The oil crisis in 1973 aggravated the situation and the need for a fresh study on the relative economics of diesel and electric traction attracted attention. The present study is a sequel to this keenly felt necessity.

This Committee was constituted with men with specialised talents, drawn from the Indian Railways and Planning Commission. The Committee held 12 sittings between January and June, 1978. The discussions during these meetings were very meaningful and the exchange of knowledge and ideas was of a high order. The Convener is thankful to all the Members of the Committee for the unstinted co-operation extended to him in completing the report in such a short time.

The detailed back-up calculations are in a separate supplement to this Report.

The active assistance given by Mr. A.A. Sahay in framing this report is gratefully acknowledged.

New Delhi  
17-6-1978

J.A.Raj  
CONVENER

## ACKNOWLEDGEMENT

Assistance, suggestions and cooperation given, in collecting data and working out details, by the various Directorates of the Railway Board and the Research, Designs & Standards Organisation of the Railways, Planning Commission, Central, Western, Northern, Eastern & South Eastern Railways, Diesel Locomotive Works and Chittaranjan Locomotive Works, is gratefully acknowledged.

The Committee also thank Officers and Staff of the Railway Electrification, Northern Railway, Allahabad, who have spent considerable time and energy in collecting field data, in working out various calculations and for willingly lending their experience of executing an electrification project.

The work done by the Sahai Committee and the NCAER has been a great help to the Committee.

## C O N T E N T S

				Pages.
CHAPTER	-	I	Introduction	... 1 - 9
CHAPTER	-	II	Scope & Methodology of Study	... 10 - 25
CHAPTER	-	III	Study of Selected Section: Delhi - Jhansi and Mathura - Gangapur City	... 26 - 34
CHAPTER	-	IV	Conclusions and Recommendations	... 35 - 46

Contd.....

## C O N T E N T S

### ANNEXURES:

		Pages
1.	Director's Committee Report - Electrification Programme in the Sixth Five Year Plan (1979-84) ...	47 - 63 47 - 63
2.	Extract of Para 19 of Minutes of Meeting held between Rly. Board & Planning Commission on 5.12.77 ...	64
3.	Cost of Electrification ...	65 - 71
4.	Views of Kunzroo & Wanchoo Accident Enquiry Committees on provision of colour light signalling ...	72 & 73
5.	Requirement of Electric Locomotives vis-a-vis Diesel Locomotives ...	74 - 78
6.	Fuel & Energy consumption norms and their costs ...	79 - 87
7.	Cost of Repair & Maintenance of Diesel & Electric Locomotives ...	88 - 92
8.	Energy Policy of Govt. of India and extract of Chapter 10 'Energy' from Draft Five Year Plan 1978-83 ...	93 - 96
9.	Traffic Projection on Delhi-Jhansi & Mathura-Gangapur City sections ...	97 - 100

### GRAPHS:

G-1	Freight traffic hauled under different modes of Traction (B.G.) ...	101
G-2	Passenger traffic hauled under different modes of Traction (B.G.) ...	102
G-3	Availability of Crude Oil ...	103
G-4	Market price of Persian Gulf oil ...	104
G-5	Consumption of Petroleum Products ...	105
G-6	Consumption pattern of H.S.D. Oil ...	106
G-7	Trends of specific fuel/energy consumption of total traffic hauled on Indian Railways ...	107

### MAPS:

Map - 1	Railway Map of India showing Electrification ...	108
Map - 2	Route Map of Delhi-Jhansi & Mathura- Gangapur City Sections ...	109
	Abbreviations ...	110
	References ...	111