

CHAPTER I
Project Management Practices in Gauge Conversion and
New Line Projects

1.1 Highlights

- **Although norms have been established by the railways for selection of projects, including a minimum rate of return, 107 out of 133 projects were taken up despite being financially unviable.**
(Para 1.7.2)
- **At the present rate of funding the railways would require another 15 years to complete the pending gauge conversion projects and 38 years to complete the pending new line projects. Despite this railways introduced 103 new projects during the last ten years. In 71 projects even firm dates of commissioning were not projected.**
(Para 1.7.1)
- **Projects were sanctioned without adequate justification and decisions were taken during implementation without keeping in mind the original objectives as a result of which the core objectives underlying the projects could not be achieved.**
(Para 1.8)
- **Uncertainties in project funding and inadequate project planning had an adverse impact on the efficiency of project implementation, which resulted in non/delayed delivery of expected benefits.**
(Para 1.8)
- **Delays in preparation of detailed estimates, lack of co-ordination with State Governments for acquisition of land, insufficient delineation of the scope of projects, deficiencies in contracts and store management and weak monitoring mechanism contributed to time and cost overruns in the selected projects.**
(Para 1.9)

1.2 Gist of recommendations

- Railways should ensure that the systems and the norms established for selection of technically and financially viable projects are kept in view in future before any fresh projects are taken up.
- Railways should work out a clear plan for completion of all the pending projects within a reasonable time frame.
- The core objectives of the project should be distinctly enunciated and subsequent planning and decision-making should be aligned towards achievement of the stated objectives.

- Clear project schedules should be framed for the projects at the initial stages and completion dates determined. Budget allotments should be in accordance with the time frames set for completion.
- Railways should plan the projects in a more comprehensive manner. The scope of the project, technical specifications, quantities and cost estimates should be accurately delineated on the basis of parameters brought out in technical surveys so as to ensure smoother project implementation within the estimated cost and time.
- Railways need to strictly observe the codal provisions in planning and execution of projects. Risk areas such as land acquisition and estimation of materials and earthwork quantities need to be carefully controlled.
- Railways need to evolve structures for closer monitoring of projects at the Ministry level. Strict observance of codal provisions for maintenance of information systems and documentation at the implementation level should be ensured.

1.3 Introduction

Indian Railways undertake a large number of construction projects for creation of new assets and upgradation of existing assets for augmentation of services. Over the years there has been a substantial increase in the capital outlay on gauge conversion projects [conversion of narrow gauge (NG)/ meter gauge (MG) lines to broad gauge (BG)] and construction of new lines projects over Indian Railways. Gauge conversion projects in 2003-04 accounted for about seven per cent of the total capital outlay of the Indian Railways while new lines projects were allocated ten per cent. The Works Programme of the Indian Railways during 2005-06 included 87 new line and 62 gauge conversion projects aimed at adding 9,234 kms of new lines and converting 13,528 kms of meter gauge/ narrow gauge lines into broad gauge. As the primary objective of these projects is to increase the efficiency of railways, proper planning, efficient execution and effective monitoring become imperative for completion of these works on time and for achieving their objectives. Various committees of Parliament and other studies have repeatedly emphasized the need for railways to prioritise their projects for best application of resources.

‘Project Unigauge’ was launched by Indian Railways on 1 April 1992 with the objective of selective conversion of meter gauge and narrow gauge to broad gauge for providing additional transport capacity and creating alternate routes to the congested BG trunk lines, in addition to industrial and economic growth of the respective areas. ‘Gauge conversion on the basis of prioritisation’ was aimed at providing alternatives to the existing congested routes and minimising transport bottlenecks and transshipment hazards, thereby enhancing the capacity and capability of the railways. At the time when the Unigauge policy was adopted, 38 per cent of the total route length of Indian Railways was on meter gauge and 6.5 per cent on NG. The Ministry of Railways (Ministry) decided in 1992 to formulate an action plan for converting more than 11,000 kms of MG/ NG routes into BG. (6,000 kms

during VIII Five Year Plan 1992-97 and 5,000 kms during IX Five Year Plan 1997-2002).

Construction of new lines, on the other hand, is undertaken for various operational, commercial or social/ strategic reasons. No proposal, whether for gauge conversion or new line, is considered financially justified unless net gain expected out of the proposed outlay, after meeting the working expenses or average annual cost of services, yields a return of not less than ten per cent under Discounted Cash Flow method (14 per cent from July 1992).

1.4 Audit objectives

The performance review of project management practices in gauge conversion and new line projects was carried out with a view to assess

- whether the system for selection of projects ensured most effective use of railways resources by prioritizing projects in terms of objectives, expected returns and availability of funds;
- whether the planning and scope of the projects and their sub-projects enabled achievement of their objectives;
- whether the projects were executed according to the time schedule and available resources following the best project management practices; and
- whether value for money was realised by achievement of the objectives of the projects as envisaged.

1.5 Audit methodology and scope

In order to assess the system of project selection and prioritisation, macro data in respect of on-going gauge conversion and new lines projects was analysed. In view of the similarity of project practices and common systems, instructions and guidelines prevailing over the different zonal railways, four representative projects were selected for detailed examination in order to assess whether the projects have been managed towards achieving their objectives in the most economic, efficient and effective manner.

The pre-execution activities in respect of the four selected cases have been reviewed in detail to corroborate the audit conclusions derived from the analysis of macro data. Performance of these four projects has been evaluated during the period from initiation of the project to its execution. Records relating to justification and sanction of these works, planning, budget allotment and funds utilization, execution through contracts, procurements and monitoring were reviewed in zonal railways and the Railway Board for collection of audit evidence in support of audit conclusions.

1.6 Acknowledgement

The audit plan including the audit objectives were discussed by Principal Directors of Zonal Railway Audit Offices in meetings with the respective General

Manager/ CAO (Construction)/ Financial Adviser and Chief Accounts Officer (FA&CAO) in the entry and exit conferences. The co-operation of the Ministry of Railways during the meetings and in the course of audit is acknowledged. Audit recommendations were discussed by Deputy Comptroller and Auditor General of India (Railways) with the Chairman Railway Board and other Board Members. The review note was issued to the Ministry of Railways in December 2005.

1.7 System of selection and funding of projects in Indian Railways

Proposals for taking up new projects, usually on the basis of Engineering and Traffic Survey results, are forwarded by zonal railway administration to the Railway Board. These proposals are expected to include financial justification, abstract estimates and techno-economic feasibility reports in support. The Railway Board has powers to approve projects estimated to cost upto Rs.100 crore. Projects estimated to cost Rs.100 crore and above are required to be put up for approval of the Cabinet Committee on Economic Affairs, duly recommended by the Expanded Board for Railways¹. Once the projects are approved, they are included in the Works Programme accompanying the Railway Budget for seeking approval of the Parliament. In case of new line projects, a Final Location Survey is carried out for preparation of detailed estimates and zonal railways take up the work only after the approval of the detailed estimates by the Railway Board.

Audit observed that the system of selection and funding of gauge conversion and new line projects in Indian Railways had the following deficiencies:

- A large number of projects were taken up by the Railways without prioritisation and sometimes even without projecting firm dates of commissioning. As a result available resources were spread thinly and the projects are likely to drag on for several years.
- A large proportion of projects were introduced despite uneconomical rate of returns.

1.7.1 Lack of prioritisation in selection and funding of projects

The Works Programme for the year 2005-06 includes works for gauge conversion, new line, track doubling, electrification, signaling and telecom, road safety, traffic facilities, track renewal, bridge works etc. Gauge conversion and new line works are high value projects. Data regarding 149 on-going gauge conversion and new line projects included in the Works Programme 2005-06 was analyzed to assess the time taken on these projects and the extent of funding over the years as follows:

¹ This Board has been set up to consider investment proposals of Railways of Rs. 100 crore and above. This Board, in addition to Chairman and Members of the Railway Board includes Financial Commissioner (Railways), Secretary (Expenditure), Ministry of Finance, Secretary (Programme Implementations) and Secretary (Planning Commission) as members.

Age-wise profile of projects

| Age profile | Number of Gauge Conversion projects | Actual expenditure upto 2004-05 (Rs. in crore) | Throw forward (Rs. in crore) | Number of New Line projects | Actual expenditure upto 2004-05 (Rs. in crore) | Throw forward (Rs. in crore) |
|---|-------------------------------------|--|------------------------------|-----------------------------|--|------------------------------|
| More than 20 years | 0 | 0 | 0 | 10 | 3254.86 | 382.54 |
| More than 10 years but less than 20 years | 20 | 4445.29 | 1407.42 | 16 | 3936.53 | 6934.05 |
| More than 5 years but less than 10 years | 36 | 4563.44 | 6540.38 | 47 | 2713.66 | 13338.44 |
| Less than 5 years | 6 | 24.15 | 2469.38 | 14 | 339.70 | 4366.81 |
| Total | 62 | 9032.88 | 10417.18 | 87 | 10244.75 | 25021.84 |

As can be seen from the table, railways have a large number of projects, which have been going on for decades. The cost of these projects, originally estimated at Rs.39,287.13 crore has been revised again and again, primarily due to delays in completion, and is now estimated at Rs.54,716.65 crore². Out of the 149 on-going projects shown in the Works Programme 2005-06, in 105 projects the physical progress was below 50 per cent, in 12 projects the progress was between 50 and 75 per cent and in 8 projects the progress was between 75 and 90 per cent. Only 24 projects were more than 90 per cent complete. In respect of 25 gauge conversion and 46 new line projects the target dates of completion had not been fixed so far (March 2005).

Railway outlay on gauge conversion and new line projects during 2005-06 was only Rs.690 crore and Rs.652 crore respectively. At this rate of funding it will take the railways another 15 years from now to complete the pending gauge conversion projects and another 38 years from now to complete the pending new line projects. It was also seen that even while a large number of earlier projects remained incomplete, railways introduced 42 gauge conversion and 61 new lines projects over the last ten years. Lack of prioritization results in over stretching and unsystematic allocation of funds which impacts not only the macro management of railway projects but also adversely affects the efficient management of individual projects and deprives the public of the benefits from the investments already made on these incomplete projects.

1.7.2 Selection of financially unviable gauge conversion and new line projects

As per the Works Programme 2005-06, sixty-two gauge conversion and eighty-seven new lines projects with a latest estimated cost of Rs.54,716.65 crore, are in progress over various zonal railways. Reasons for taking up these projects, their rate of return, year of sanction, year of commencement and anticipated date of completion for all ongoing gauge conversion and new line projects were compiled and analysed. It was seen that an amount of Rs.19,277.63 crore had been spent on these projects upto March 2005 and further investment of Rs.35,439.02 crore is required to complete these projects. Audit observed that out of 137 gauge conversion and new line projects³ for which rate of return (ROR) was available, 133 projects were

² Latest revised estimated cost of works

³ Rate of returns in respect of four gauge conversion and eight new line projects not available.

taken up on various commercial and socio-economic considerations, of which 34 per cent (46 projects) had negative rate of return. Forty-six per cent (61 projects) were unremunerative and had rate of return less than the required rate of 10 per cent (14 per cent for projects introduced from 1993-94 onwards). Only 26 projects had a positive rate of return over and above the required percentage. Out of these 26 projects, the rates of return in five projects were subsequently revised downwards and became less than the prescribed rate of return.

It was thus seen that though norms have been established by the railways for selection of projects, 107 out of 133 projects were taken up despite being financially unviable. This has an adverse impact on the financial health of railways.

During discussions the Ministry generally accepted the audit observations and stated that the issues raised in the review are also an area of concern in the Ministry. Recently the Ministry of Railways has made efforts to re-prioritise the projects in various categories out of which the highest priority is being given to projects which are substantially complete and where the throw forward was less than Rs.100 crore. Another category of projects, which are financially viable and operationally required, is also to be taken up on priority. The Ministry also stated that it would be possible to complete these two categories of projects within the next 2 to 5 years, even at the present level of funding. However, audit noted that the two categories mentioned by the Railway administration covers only 12 out of the total shelf of gauge conversion and new line projects and for the remaining projects which have a throw forward of over Rs.40,000 crore, there is no clear plan with the railways for obtaining resources.

Recommendations

- Railways should ensure that the systems and the norms established for selection of technically and financially viable projects are kept in view in future before any fresh projects are taken up.
- Railways should work out a clear plan for completion of all the pending projects within a reasonable time frame.

1.8 Planning and execution of selected projects

Audit studied the project management of four selected projects⁴ starting with the justifications furnished, decisions taken during the implementation of the projects and project management practices so as to corroborate the audit conclusions derived from the above analysis.

Audit noted that sanction of projects without adequate justification and decisions taken without keeping in mind the original objectives, uncertainties

⁴ **Gauge Conversion of Kurduwadi-Pandharpur section and construction of a new line between Latur and Latur Road in Central Railway (CR)**
Gauge Conversion Project of Tirupati-Pakala-Katpadi section of South Central Railway (SCR)
Gauge Conversion of Rupsa Bangriposi section of South Eastern Railway (SER)
Construction of New Line between Dewas and Maksi in Western Railway (WR)

in project funding and inadequate project planning had an adverse impact on project implementation.

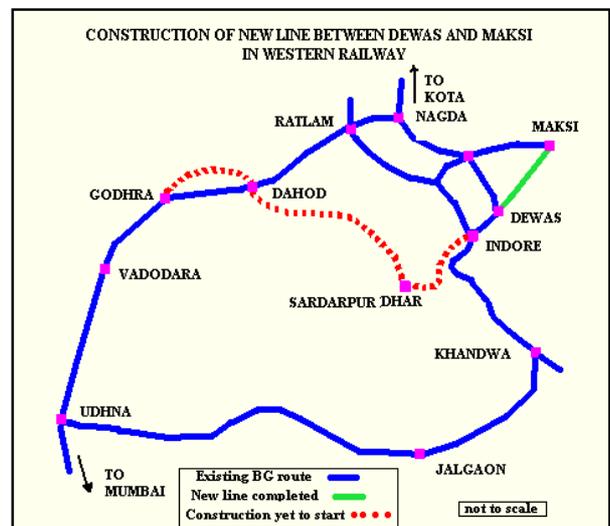
1.8.1 Inadequate justification for sanction of projects

Gauge conversion projects were taken up by the railways under the Unigauge policy which was aimed at providing additional transport capacity and creating alternate routes to the congested BG trunk lines in addition to industrial and economic growth of the region at a relatively low cost. The rationale for taking up 'Gauge conversion on the basis of prioritization' included the operating ratio for meter gauge, which was 164 per cent as compared to 80 per cent over broad gauge. The Unigauge policy was clearly aimed at improvement of the overall operating ratio. Hence it was accepted that gauge conversion projects, primarily funded through Capital/Capital fund, could only be justified based on the rate of return.

The four gauge conversion/new line projects selected for detailed audit had operational objectives such as avoiding transshipment of cement traffic (CR), providing an alternate route (SER, SCR and WR), joining two trunk BG routes (CR, SCR) and providing better transport facilities (SCR, CR). Selection of projects for gauge conversion under the Unigauge policy was to be done keeping in mind not only the overall policy objectives but also on the basis of their financial viability. It was, however, observed that the rate of return in respect of all the three gauge conversion projects selected (CR, SCR, SER) were far below the benchmark of 14 per cent prescribed by Railway Board, while the new line project (WR) was taken up despite a negative rate of return. In two cases (SCR, CR) calculation of rate of return was not in accordance with the codal provisions. Out of the four projects selected in audit, two projects (SCR and CR) had been considered earlier by the railways but not taken up, as they were found unremunerative by survey committees. These financially unviable projects were later taken up under the Unigauge policy. The decision to take up financially unviable projects was not aligned with the spirit of the Unigauge policy.

1.8.1.1 Construction of new line from Dewas to Maksi (36 kms) in Western Railway

The Dewas - Maksi new line project (WR) was initially conceived (1989-90) as a long new line project between Godhra and Maksi to meet the requirement of additional traffic of coal between the two stations. The initial Reconnaissance Survey of the project indicated a positive rate of return and hence the Planning Commission approved (January 1989) the project on operational grounds



with the condition that only preparatory work for Final Location Survey, detailed engineering drawings and other actions to firm up the cost and traffic projections etc., should be taken up and they be apprised of the results. However railways commenced (1989-90) the work of Dewas-Maksi section of the project on urgency certificate, far beyond the scope of approval accorded by the Planning Commission. In December 1993 the Godhra-Maksi project showed a negative rate of return in the Final Engineering-cum-Traffic Survey. Hence the work on Dewas-Maksi section was frozen after incurring an expenditure of Rs.10 crore on the project. The railways recommenced the work only on the Dewas-Maksi section (September 1996) on consideration of the investment already made and possibility of encroachment of land already acquired, even though the section had a rate of return of (-) 86.55 per cent. Thus, due to the initial error in starting the work by ignoring the Planning Commission's advice, further investments were made on a highly unremunerative project.

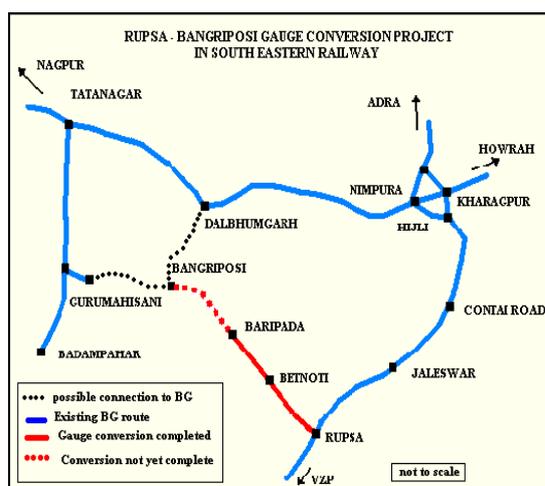
The fate of the remaining portion of original new line project is still undecided and the project continues to find place in the Works Programme. Though opened for traffic in November 2002, the new line between Dewas and Maksi is incurring losses in operations.

1.8.2 Decisions not aligned with original objectives

Audit observed that while taking decisions on planning and execution of the projects, the original objectives were often lost sight of, which resulted in defeating the basic objective underlying the projects.

1.8.2.1 Gauge conversion of Rupsa-Bangriposi section (89 kms) in South Eastern Railway

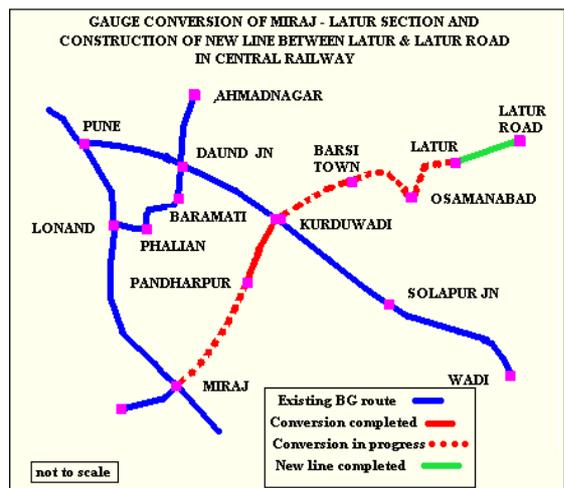
This project, which was conceived as an alternate to the third line between Kharagpur and Tatanagar, was broken up into two phases, i.e., Phase I – Gauge Conversion of Rupsa-Bangriposi and Phase II- connecting Bangriposi with either Gurumahisani or Dalbhumgarh by laying a new line. While a part of the Phase I (Rupsa-Baripada) was on the verge of completion, the remaining part of Phase I (Baripada-Bangriposi) and the connecting new line from Bangriposi were not sanctioned, thus defeating the original objective. As the project is financially unviable, railways neither have any plans to complete the remaining portion nor to construct the connecting link. An expenditure of Rs.58.92 crore has been incurred on the portion completed so far.



In addition, the Zonal Railway (SER) adopted a mixed track structure instead of conforming to the standard required to run heavy haul trains, thereby defeating the basic objective of providing an alternate route to the heavy haul freight traffic. Unless additional expenditure is incurred on dismantling and re-laying of rails of required specifications, it will not be possible to gain the advantages this project was sanctioned for. The ruling gradient of the section over NG was 1 in 100. The Final Location Survey proposed a gradient of 1 in 150 keeping in view the anticipated heavy haul traffic, which was used to justify the project. However, finally the gradient was kept at 1 in 100 (June 2002), as the railways ruled out the possibility of any heavy haul traffic on the route. Due to the gradient of 1 in 100, if railways do decide to run heavy haul traffic on the section in future, as was originally envisaged, it would only be possible with the help of a banking engine, multiple locomotives or consists⁵, which would involve extra expenditure.

1.8.2.2 Gauge conversion of Miraj-Latur section (332 kms) and construction of new line between Latur and Latur Road (42 kms) in Central Railway

The gauge conversion project from Miraj to Latur (CR) was conceived to avoid transshipment activities at Kurduwadi station for cement traffic from Wadi to Miraj and to bridge the gap between two existing BG networks of Central and South Central Railways. The project was broken up into four phases from Latur Road-Latur (New line), Latur-Kurduwadi, Kurduwadi-Pandharpur and Pandharpur-Miraj (gauge conversion from NG to BG). The traffic from Wadi to Miraj required gauge conversion between Kurduwadi to Miraj via Pandharpur. However, as the project was conceived between Latur Road to Miraj, CR took up the phases Latur Road-Latur (New line) and Latur-Kurduwadi (Gauge conversion) first, though this was not on the route for cement traffic and transshipment was not an issue for this segment. Later on Railway Board asked CR to change the prioritization of phases and take up Kurduwadi-Pandharpur section instead of Kurduwadi-Latur. This, however, would still not help avoid transshipment (one of the primary objectives of Unigauge policy) and the objective of connecting BG networks of Central and South Central Railways would also not be achieved until Pandharpur is connected to Miraj in the last phase. As such none of the operational objectives of this project taken up under the Unigauge Policy will be available to the railways till all the phases are completed.

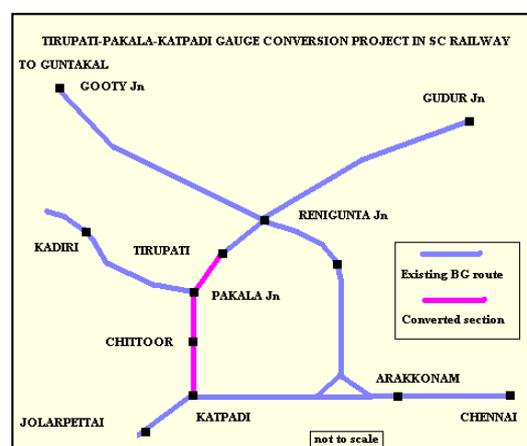


⁵ Consist – Combination of three locomotives to haul the train

1.8.2.3 Gauge conversion of Tirupati-Pakala-Katpadi section (104 kms) in South Central Railway

The Railway Board, on the recommendations of the Survey Committee, had earlier rejected the SCR project of gauge conversion of Tirupati-Pakala-Katpadi section, as it had inadequate traffic prospects and only a limited utility in providing an alternative to the existing saturated route of Gudur-Renigunta-Arakkonam to Jolarpettai via Katpadi. Despite this the project was later (1992-93) sanctioned under the Unigauge policy with the financial justification coming from projected goods traffic. Both the ends of Tirupati-Pakala-Katpadi section viz. Gudur-Renigunta-Tirupati as well as Arakkonam-Katpadi-Jolarpettai sections were electrified and commissioned by 1986. Despite being aware of the fact, Railway Board accorded administrative approval for electrification of Tirupati-Pakala-Katpadi section only in June 2003 when the project was on the verge of completion. Hence the converted section could not be opened for goods traffic. Failure to synchronize the work of electrification with the completion of gauge conversion resulted in non-materialization of projected goods earnings of Rs.19.39 crore per annum.

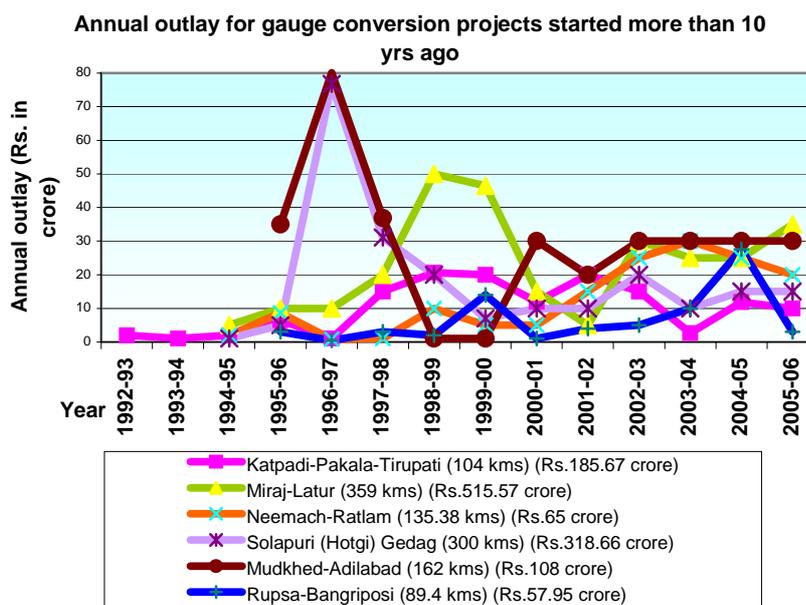
Thus it appeared that while the operational objectives of the projects were declared clearly in line with the general policy of enhancing transport capacity and capability of the railways, successive decisions during the design and implementation stages



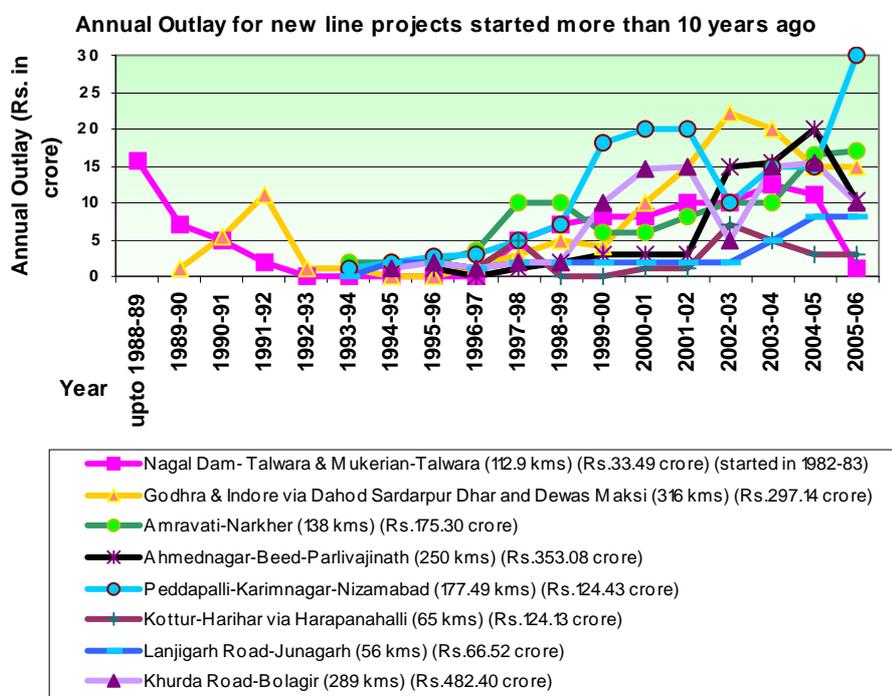
of the projects showed signs of policy drift. Expenditure was thus incurred without the railways getting the intended benefits.

1.8.3 Impact of uncertainties in funding on project implementation

Audit attempted to assess the impact of uncertainties in funding on the four selected projects and observed that micro-management of the projects was seriously hampered as the project authorities could neither accurately estimate the costs involved nor were they in a position to draw up detailed project schedules or in one case, even anticipate a date of completion for the project. The following graphs indicate the funding fluctuations in some railway projects pending for more than ten years.



These gauge conversion projects were taken up more than ten years back but only 42 per cent to 84 per cent of the work has been completed so far. While the survey reports in gauge conversion projects generally prescribed a total time frame of four to five years for completion, it was seen that the level of funding in most of these projects has been much below Rs.5 crore per year in the first five years and even subsequently there have been drastic fluctuations in the funding pattern. Thus there was no possibility of these projects getting completed within the prescribed time frame.



In case of these new line projects taken up more than ten years back only 15 per cent to 55 per cent of the work has been completed so far. The projects

were kept starved of funds and retained in the works programme by making token provisions resulting in delay in completion of the projects, apart from significant increase in costs.

1.8.3.1 Budget allotments not in consonance with the set time frames

The report and justification accompanying the detailed estimate of projects should indicate the period by which the project is to be completed and investment schedule should be drawn for the execution period⁶. Though realistic time frames were fixed for completion of all the three gauge conversion projects selected for detailed audit, investment schedules were not prepared and the resources for implementing these projects were not allocated in consonance with a set time frame. In two out of four projects selected (SCR and SER), the Railway Board did not allot funds requested for by the zonal railways, while the zonal railways failed to utilize even the allotted amounts. Central Railway did not receive phase-wise funds and utilization of funds was also not watched by them phase-wise. As a result an amount of Rs.7.56 crore was blocked in works of Phase III and IV, which were later deferred due to change in priority. For the SCR project, though the survey committee suggested a completion period of four years, this was not kept in mind while allotting funds for the project and the project dragged on for 12 years (SCR). In the SER project, Railway Board subsequently reduced the allocations to this project due to its being un-remunerative, further slowing the pace of implementation.

1.8.3.2 Project schedule not defined

Execution of the works included in the project estimate should correspond to a logical project schedule as any imbalance in this regard affects the progress of the project, besides non-achievement of contemplated objectives. In three out of four projects (CR, SCR, SER) Programme Evaluation and Review Technique (PERT) Charts were not prepared and project schedules were not clearly defined. In one project (CR) the railway administration did not schedule and prioritize the work according to availability of funds and started the work over the entire length of the section, which led to blocking of funds in Phase III and IV works. In SER earthwork was started simultaneously over all four segments of Rupsa-Bangriposi section. Earthwork carried out over segment III and IV was wasted when Railway Board restricted further financial commitment. In one case (CR) construction of a station building was started before laying broad gauge track, which requires a higher-level platform than narrow gauge. As a result the station was constructed at a level unsuitable for the broad gauge line. In SCR, despite completion of eighty per cent of earthwork, laying and linking works could not be taken up due to non-availability of permanent-way material such as rails, sleepers, points and crossings etc., as action for procurement was initiated very late. Thus it was seen that the efficient execution of projects was hampered due to non-preparation of project schedule as required under the rules.

⁶ Para 722, 541 of Indian Railway Engineering Code

As an explanation for not drawing up project schedules one of the Railway Administrations (SCR) categorically stated that project scheduling was not feasible as execution of a project was primarily dependent on the budget allotments made by the Railway Board.

During discussions the Ministry accepted the audit observation that uncertainties in funding affects the project planning. The Ministry also stated that progress of some projects was also affected in the past few years by the fluctuations in steel prices. The contention of the Ministry reinforces the audit observation and further emphasises the need for clear commitment of funds commensurate with the time frame, for realising value for money invested.

Recommendations

- The core objectives of the project should be distinctly enunciated and subsequent planning and decision-making should be aligned towards achievement of the stated objectives.
- Clear project schedules should be framed for the projects at the initial stages and completion dates determined. Budget allotments should be in accordance with the time frames set for completion.

1.9 Project management practices leading to delays and cost escalation

Audit observed time and cost overrun in the selected projects and cost of construction per kilometer against the estimated cost as follows:

(Rs. in crore)

| Project | Time overrun | Cost overrun | Estimated cost of conversion/ construction per km | Actual cost of conversion /construction on per km |
|--|---|-------------------|---|---|
| Gauge Conversion of Kurduwadi-Pandharpur section in Central Railway | 28 months | 36.88 (78%) | 0.8870 | 1.5828 |
| Construction of a new line between Latur and Latur Road in Central Railway | 81 months | 45.38 (128%) | 0.8426 | 1.9214 |
| Gauge Conversion Project of Tirupati-Pakala-Katpadi section of South Central Railway | 69 months | 69.8 (73.58%) | 0.60 | 1.25 |
| Gauge Conversion of Rupsa Bangriposi section of South Eastern Railway | Initially, the target date was not fixed. Later fixed as June 2004. Phase I not yet open for traffic. | 66.90 (115%) | 0.60 | 1.40 |
| Construction of New Line between Dewas and Maksi in Western Railway | 47 months | 10.64 (22.16%) | 1.00 | 1.62 |

Economic and efficient implementation of selected projects within a reasonable time frame is axiomatic for deriving their intended benefits.

Audit examined the deficiencies in project implementation and observed that delays in preparation of detailed estimates, lack of co-ordination with State Government for acquisition of land, insufficient delineation of the scope of projects, deficiencies in contracts and store management and weak monitoring mechanism had contributed to time and cost overruns in the selected projects.

1.9.1 Delay in preparation of detailed estimates

Rules provide that technical sanction to a project should be given by the competent authority only after ascertaining that the details of the scheme as worked out are satisfactory, the methods proposed for the execution of the work are adequate and that the cost has been estimated from reliable data and is likely to be reasonably accurate. The work can commence only when the detailed estimates are prepared and sanctioned and the competent authority allots adequate funds. Once administrative approval of a project is conveyed to the zonal railway through the sanction of abstract estimates, the exercise of preparation and submission of detailed estimates for technical sanction is started. In two out of four projects selected (SCR and SER) it was seen that there were abnormal delays in preparation of detailed estimates and subsequent approval by Railway Board, which added to time overrun of these projects. Though part detailed estimates of the SCR project were sanctioned early (December 1993), final detailed estimates for main line were sanctioned only after a gap of three years (July 1996) and estimates for yard arrangements (Tirupati) sanctioned after nine years (January 2002). The work on the SER project started in 1997. However, the detailed estimates of Phase-I were sanctioned only after a time-gap of eight years (April 2003). Railway Board took one and a half year to sanction the detailed estimates of the new line project of WR.

1.9.2 Delays due to lack of co-ordination with the State Government for acquisition of land

In one of the four selected projects (CR) it was seen that poor co-ordination with the State Government led to delay of six to seven years in acquisition of land resulting in increase in cost of land and other financial commitments including interest payments to land owners.

1.9.3 Insufficient delineation of scope of projects leading to material modifications

Railway Board (July 1992) directed the zonal railways to adhere to the original scope of work and avoid material modifications in the case of gauge conversion works. Where absolutely essential, such proposals for modifications were to be accompanied by fresh financial appraisal and revised rate of return. It was seen that material modifications worth Rs.10.22 crore (12.41 per cent of the project cost) and Rs.41.88 crore (58.41 per cent of the project cost) were introduced in CR and SCR respectively. These material modifications were introduced due to non-inclusion of provisions for MACLS⁷ signalling, architectural survey of a station, two Road-over-bridges

⁷ Multi Aspect Coloured Light Signalling

and extension of a Foot-over-bridge in CR and provision for electrification in SCR. Such changes in the scope and cost of the projects being introduced after commencement indicate insufficient delineation of the scope of the projects, which, besides delaying the projects, resulted in cost overruns.

1.9.4 Modifications in scope of projects without sanction of competent authority/additional works not related to project taken up

If the expenditure of a project is likely to exceed the amount provided in the detailed estimate, the railway administration should submit revised estimates to the competent authority for sanction.⁸ As per Cabinet decision railway administration should revise/ update the estimates for works costing more than Rs.50 crore every year so that government is aware of the throw forward liability of various sanctioned projects. Audit observed that while in general necessary sanctions have been taken from competent authorities, in one of the three gauge conversion projects examined, excess expenditure was incurred beyond the powers delegated to the zonal railway (CR). Three cases worth Rs.9.1 crore, which should have been taken as material modifications as per the codal provisions⁹, were not submitted for sanction to the competent authority (CR). Two material modifications worth Rs.18.17 crore were introduced by the zonal railway (SCR) and an expenditure of Rs.3.18 crore had been incurred on them despite Railway Board rejecting the proposal of the zonal railway on the ground that as the material modifications suggested were unnecessary and unrelated to the approved project.

1.9.5 Non-assessment of risk and constraints

Rules provide that special problems that may be encountered while executing the project are to be brought out in the techno-economic survey reports for finding possible solutions¹⁰. This helps in accurately estimating the time frame and the cost involved. In all the four projects examined by audit a specific risk assessment exercise was not undertaken. In one of the four projects the zonal railway (CR) fixed the time frame for completion subject to availability of funds and critical material. As Railway Board did not ensure timely allocation of sufficient funds, the work has not progressed as originally envisaged.

1.9.6 Deficient contract management

In all the four projects, deficiencies in contract management resulted in slow progress of the works. Out of the 45 contracts reviewed in CR, delay in execution was noticed in 44 contracts. In 20 contracts the reasons were due to lapses on part of the railway administration such as not handing over clear site, not giving clear formation levels, obstruction of power crossings/ trees, paucity of funds etc., In 22 cases there was an upward variation in the value of contract ranging from 2 to 58 per cent and in 15 cases there was a downward variation from 2 to 74 per cent due to change in scope of the works. There were delays (WR) on the part of railway administration in arranging

⁸ Para 708 and 1136 of Indian Railway Engineering Code

⁹ Para 1110 of Indian Railways Engineering Code

¹⁰ Para 536 and 572 of Indian Railways Engineering Code

Permanent-way material, which led to a delay of more than a year in laying, linking, cutting, cropping and welding of rails.

Gauge conversion and new line projects of the Railways involve considerable earthwork. Estimation of quantities in earthwork is not scientifically done in a large number of cases such as seen in SER where gross variations in quantities of earthwork (excess upto 1200 per cent) were noticed leading to increase in expenditure (Rs.0.80 crore). In CR earthwork contracts were awarded much below the estimated cost as a result of which the contractor could not complete the work and delay on this account delayed the project by three years and increased the project cost by Rs.0.53 crore. In the risk and cost contracts, awarded as a consequence, the amount of risk and cost has either not been calculated or not recovered from the contractors. Contractors have gone for arbitration in eight cases. SCR took over 16 months to finalise earthwork contracts. Though contractors were allowed a period of 3 to 7 months for completing the work, extensions were granted for durations ranging from 2 to 62 months due to railway administration's failure to arrange for blocks. Nine contracts were terminated for no fault of the contractors and subsequently awarded at a higher rate resulting in extra expenditure of Rs.1.38 crore. Thus earthwork estimation is a risk area requiring clear guidelines for estimation. In the earthwork contract for minor bridges in WR project, extensions were granted in a routine manner to the first contractor and also to the second one to whom the risk cost contract was awarded. This resulted in a delay of 48 months.

1.9.7 Unsatisfactory stores management adding to delays

Stores requirements for specific works are to be procured neither in excess nor in advance of requirements as this would result in blocking of funds affecting exchequer control¹¹. Project implementing authorities are authorised to procure stores specific to works/ projects executed by them in order to ensure availability of stores on time and as per requirement. Audit observed that in all the four projects selected for detailed scrutiny, deficient stores management led to delays in execution as well as blocking of funds.

- In SCR delayed procurement of permanent-way material (3 to 4 years) hampered the progress of work which was delayed by 6 years. Cases of excess and/or advance procurement of stores over and above requirement were also noticed, blocking capital which could have been applied to other essential works. Advance procurement of cables and relays blocked an amount of Rs.3.87 crore. Excess procurement of permanent-way material and signaling items were made and material worth Rs.2.88 crore was lying surplus even after 19 months of commissioning of the project. Ballast of a higher standard was also procured in excess quantity, which resulted in excess expenditure of Rs.2 crore.
- Released material worth Rs.9.64 crore and Rs.2.51 crore was awaiting disposal for two and three years in SCR and SER respectively.

¹¹ Para 1438 of Indian Railways Engineering Code

- Deficiencies in maintenance of material-at-site (MAS) accounts also made monitoring of procurement and utilization of stores more difficult. No action was taken to clear heavy balances of Rs.23.52 crore in MAS accounts in CR. In WR a balance of Rs.6.86 crore under MAS accounts was cleared only 26 months after completion of the project. The MAS account was not maintained for want of stock holding facilities at site in SER.

1.10 Monitoring

For successful execution of any project it is necessary to monitor it closely. The execution of projects in railways should be monitored at various levels at regular intervals. It was observed that the role of the Railway Board in the monitoring of projects under implementation is not proactive and once a project is sanctioned for implementation its monitoring is primarily left to the various zonal railways. No structures have been created at the Ministry level for regular monitoring of their progress. The General Managers/ Chief Administrative Officers of various zonal railways intimate the progress of works under implementation to the Railway Board through Periodical Confidential Demi-Official letters (PCDOs) to Member (Engineering). The Railway Board limits its role to responding to specific issues raised by the zonal railways through PCDOs or otherwise.

At the zonal railways level rules provide for preparation of progress report cum financial review of the project, linking the progress of work with the expenditure incurred¹² to facilitate monitoring. These reports are to be prepared and submitted to Chief Engineer and FA&CAO every half-year from commencement of the project. It was seen that half-yearly reports were not prepared in SCR for monitoring the progress of implementation of the projects.

‘Works Registers’ serve as an important management tool in comparing the expenditure incurred against the provisions made in the estimates for different works¹³. It was seen that ‘Works Registers’ were not maintained properly and details of work-wise estimates, budget allotments and up-to-date totals for expenditure on all works were not struck, due to which Railways failed to exercise control over the expenditure on these works (CR).

Recommendations

- Railways should plan the projects in a more comprehensive manner. The scope of the project, technical specifications, quantities and cost estimates should be accurately delineated on the basis of parameters brought out in technical surveys so as to ensure smoother project implementation within the estimated cost and time.
- The Railways need to strictly observe the codal provisions in planning and execution of projects. Risk areas such as land acquisition and

¹² Para 1518 to 1522 of Indian Railway Engineering Code

¹³ Para 1472 of Indian Railway Engineering Code

estimation of materials and earthwork quantities need to be carefully controlled.

- Railways need to evolve structures for closer monitoring of projects at the Ministry level. Strict observance of codal provisions for maintenance of information systems and documentation at the implementation level should be ensured.

1.11 Conclusion

As brought out from time to time by the Ministry of Statistics and Programme Implementation, Government of India, the Ministry of Railways accounts for the largest number of pending projects involving considerable investment. Many of these projects have very long gestation periods and even firm dates of commissioning have not been established in many such projects. Railway projects have an impact on most other sectors of the economy and non-completion of projects not only locks up scarce railways resources in these projects but also deprives the railways and the general public of the expected benefits. Even while a large number of earlier projects remained incomplete Railways have been introducing new projects. This has put the railways resources under pressure and it is estimated that at the present rate of funding the Railways will need 26 years to complete the gauge conversion and new line projects in hand. Lack of adequate resources has also impacted project execution at micro-level. While the Ministry of Railways is attempting to prioritise the large shelf of projects, the resource gap is unlikely to be bridged in the near future.